

PROCEEDINGS BOOK
ISBN: 978-616-440-849-4



**THE 5th
ASIAN
ACADEMIC
SOCIETY
INTERNATIONAL
CONFERENCE**

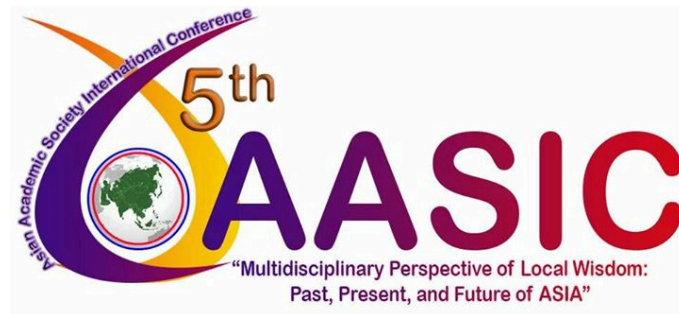
Themes:
Health Sciences
Education and Social Sciences
Engineering and Technology



Indexed by:



Copyright© & Published by Mr Agianto (5th AASIC)
Edition & Year: 1st Edition, July 2017



Copyright © & Published by Mr Agianto (AASIC 5th)

Edition & Year: 1st Edition, July 2017

ISBN: 978-616-440-849-4

All right reserved

Printed in Khon Kaen, Thailand

2017

Find us on the internet: <http://5thaasic.permithakhonkaen.org/>



The 5th AASIC aims to provide the answer of complexity problem from sharing knowledge and experience among Asia countries through integrated research from many talented researchers. The aim will bring many benefits to support any policy makers in Universities, Governments, Non-Governmental Organizations, and many practical researchers who concern to establish the solving challenging problems in Asia. The continuous program of AASIC can be utilized to expand networking among experts, professionals, practitioners and students in order to keeping updated to the current issues of the multidisciplinary studies on health sciences, business, economics, education, art, social sciences, natural science, engineering, technology and agriculture. The committee believe that all submitted papers are important to spread the knowledge and spread the problem solving through many research' experiences, afterwards, the committee will publish and share it into the proceeding conference book, CD of full-paper book, whilst selected papers will have an opportunity to be published in the International Journal with DOAJ and Google Scholar index, including to Scopus indexes.

REVIEWER TEAM

BERNATAL SARAGIH
INDONESIA

JONATHAN RIGG
SINGAPORE

BORWONSAK LEENANON
THAILAND

KAPTI RAHAYU
INDONESIA

CHANTANA BOONYARAT
THAILAND

KHEMIKA YAMARAT
THAILAND

DYAH SUNGGINGWATI
INDONESIA

ORAWAN MONTHKANTIRAT
THAILAND

FANI HARIS
INDONESIA

PALL CHAMROEN
CAMBODIA

IMAN PERMANA
INDONESIA

SARJU SING RAI
USA

SEKSON YONGVANIT
THAILAND

SITI RAMDIAH
INDONESIA

SOMPORN RUNGREANGKULIJ
THAILAND

SUHARDI
INDONESIA

SUPAWAN
THAWORNCHINSOMBAT
THAILAND

THIWAKORN RACHUTORN
THAILAND

WANAPA SRITANYARAT
THAILAND

WIDI SUNARYO
INDONESIA

YAOWARED CHULIKIT
THAILAND

YUSI RIWAYATUL AFSAH
INDONESIA

ZAIRIN NOOR
INDONESIA

Prefaces



The Speech of Indonesian Ambassador on
"5th ASIAN Academic Society International Conference
(AASIC)"
on July 26 – 27, 2017

The honorable President of Khon Kaen University, Assoc.
Prof. Kittichai Triratanasirichai

The honorable Education and Culture Attache of the
Embassy of Republic Indonesia, Bangkok Thailand,
Prof. Mustari.

The honorable the keynote speaker from Coordinating
Ministry of Politics, Law and Security Indonesia, H.E. Mr.
Lutfi Rauf, M.A

The honorable guest speakers from various disciplinary
expertise.

The honorable all the academicians, researchers, and
scholars in ASEAN Countries

Distinguished guests, ladies and gentlemen.

It is my privilege to welcome you to this high level
conference: the 5th ASIAN Academic Society International
Conference: Multidisciplinary Perspective of Local Wisdom;
Past, Present, and Future ASIA and to Thailand, the Land of
Smile.

I want to congratulate the Indonesian Students
Association in Thailand, particularly in Khon Kaen Branch
and Khon Kaen University as a whole for taking the initiative
to organize this conference dedicated to the advanced
academic and research that are nowadays increasingly
important, as are the awareness on global sustainable
development. I also would like to thank to Khon Kaen
University as they have supported this event from the
beginning. I am proud to be a part of Khon Kaen University,
which has many collaborations and MoU with many
institutions in Indonesia. Hopefully there will be many
international activities between Khon Kaen University and
Indonesia institutions in the future.

The Embassy of Republic of Indonesia in Bangkok is a
place for Indonesian citizens and students that always

encourages our people to contribute their potential abilities and capabilities for Indonesian existence around the world. I would like to thank, especially, everyone who has contributed in one way or another to the organization and success of this conference. We are also grateful to all of the participants who have gathered here today for this historical and valuable event.

Distinguished Ladies and Gentlemen,

The 5th ASIAN Academic Society International Conference is one of the Indonesian movements to develop the academic and research field. It is not only a matter reserved for developing regions alone, but it is also an objective shared by all countries, especially Indonesia and Thailand as it is a collective global effort to deal with globalization.

For 5 years, the Embassy of Republic of Indonesia, associated with Indonesian Student Association in Thailand and Universities in Thailand have committed efforts to create this event as the manifest of urgency education progress. Through this event, we, together, consider that the matter occurring today, is caused by human resources. Through this event also, we will be gaining a platform for sharing best practices and lessons learnt from ongoing efforts.

Later today, we will listen to the keynote speaker and the guest speakers on the past, present, and future of ASIA. Then tomorrow, we will have two workshops on how to write academically for International Publication and the Future of ASEAN in Socio-Community pillar: Challenges and Prospects.

Distinguished Ladies and Gentlemen,

I am perceived confidently that this conference will provide positive influence and contribute to develop the academic field. I look forward to the interesting deliberations that will take place here and wish you all a very successful conference. Thank you for your kind attention.

The Speech of Khon Kaen University President on
"5th ASIAN Academic Society International Conference
(AASIC)"
on July 26 – 27, 2017



The honorable Indonesian Ambassador for Kingdom of Thailand, H.E. Mr. Ahmad Rusdi
The honorable Education and Culture Attache of the Embassy of Republic Indonesia, Bangkok
Thailand, Prof. Mustari.
The honorable keynote speaker from Coordinating Ministry of Politics, Law and Security
Indonesia, H.E. Mr. Lutfi Rauf, M.A
The honorable all guest speakers from various disciplinary expertise.
The honorable all the academicians, researchers, and especially scholars in ASEAN Countries

*Distinguished guests, ladies and gentlemen.
Good Morning.*

It is my pleasure to be a part of this event; the 5th ASIAN Academic Society International Conference on Multidisciplinary Perspective of Local Wisdom; Past, Present and Future ASIA, organized by the Indonesian Students Association in Khon Kaen, supported by the Embassy of Republic of Indonesia for the Kingdom of Thailand and Khon Kaen University. I am delighted with my special gratitude to all the sponsors and participants to make this event successful or happen.

By holding this event, Khon Kaen University has actively committed towards innovating the academic world. As we know that we are now facing the new era of globalization, especially ASEAN Economic Community, and the integration is not only limited to the economic aspect. The ASEAN countries should also focus on the integration of the people. One vision of ASEAN Community is to create a people-centered community based on a socio-cultural pillar, and it can be started from here, sharing the idea of multidisciplinary perspective of local wisdom.

Hence, Khon Kaen University as the largest university in Northeastern Thailand, fully supports this event as a good opportunity to bring all academicians, researchers and scholars envisioning the better future. This two-day international conference will offer the enlightenment on current conditions around the world. Therefore, it will give the awareness of healthy life, humanity and technology.

Before the session starts, I would like to say once again thank you for your coming and please prepare yourself to be excited and inspired by the passionate and knowledgeable experts. It is my pleasure to see many of you here.

Thank you, Khob Khun Khrap



The Speech of Chairman on
"5th ASIAN Academic Society International Conference
(AASIC)"
on July 26 – 27, 2017

The honorable Indonesian Ambassador for Kingdom of Thailand, H.E. Mr. Ahmad Rusdi
The honorable President of Khon Kaen University, Assoc. Prof. Kittichai Triratanasirichai
The honorable Education and Culture Attache of the Embassy of Republic Indonesia, Bangkok
Thailand, Prof. Mustari.
The honorable the keynote speaker from Coordinating Ministry of Politics, Law and Security,
Indonesia, Mr. Lutfi Rauf.
The honorable all guest speakers from various disciplinary expertise.
The honorable all the academicians, researchers, and scholars in ASEAN Countries

*Distinguished guests, ladies and gentlemen.
Good Morning.*

It is such an honor and delight to speak on report of this event; the 5th ASIAN Academic Society International Conference; Multidisciplinary Perspective of Local Wisdom; Past, Present and Future ASIA, which is organized by the Indonesian Students Association in Khon Kaen and also supported by the Embassy of Republic of Indonesia for the Kingdom of Thailand and Khon Kaen University.

During the past five years, the Indonesian Students Association had an excellent AASIC which held used to be in Bangkok, Thailand but this year, Khon Kaen University settled as the host for 5th AASIC. We are very proud to hold this event possible and successful. Here, I would like to deliver my gratitude to all sponsors and participants to make this event.

This event is followed by 116 participants that divided into 2 types of panels, 92 oral presentations and 24 poster presentations. By classifying subtheme into 3 groups, there are 41 presenters from Health Science category, 51 presenters from Social Science category and 24 presenters from Engineering, Food Technology and Agriculture.

This event consists of two days-international conference, which on the first day activities include special speech from the keynote speaker from Coordinating Ministry of Politics, Law and Security Indonesia, H.E. Mr. Lutfi Rauf, M.A and guest speakers from Khon Kaen University Assoc. Prof. Wongsu Laohasiriwong, then, Dr. Stephen M. Whitehead, an internationally recognized author, consultant and researcher on gender, sexuality, identity, management and relationships and from Indonesia Prof. Dr. Kapti Rahayu Kuswanto. It will be followed by oral presentations and gala dinner. Furthermore, on the second day activities include two workshops of academic writing for international publication and the future of ASEAN Socio-Cultural Community; Challenges and Prospects.

Once again, I would like to say thank you for your participation and please prepare yourself to gain the treasure of knowledge from the passionate experts. Then, share the valuable enlightenment for a better future. It is my pleasure to see many of you here.

Thank you, Khob Khun Khrap.

Content List of Full Paper

Health Sciences

Relation between Dehydration and Short Term Memory Function Impairment in College Students

ANNISA BUNGA NAFARA, MOCHAMAD BAHRUDIN, HASANAH..... 1

Tackling Indonesia's Diabetes Challenge with Indonesian Traditional Herbs as Dietary Supplementation to Reduce Development of Cardiovascular Complications: Promotion the Use of Natural Product

APRILLIA TANTO, FAIRUZA SYARFINA, FAHMI DIMAS ABDUL AZIS, PRIMA ALIFIAN H, SAFIRA ADILLA..... 6

Averrhoa Carambola Benefits to Reduce Hypertension

JENITA DOLI TINE DONSU, HARMILAH, MARIA H. BAKRI 13

Implementation of Diabetic Foot Ulcer Prevention Program in the Provincial Hospital, Pontianak, West Borneo, Indonesia

KHARISMA PRATAMA, NICHAPATR PHUTTHIKHAMIN 18

Personal Hygiene of Adolescents Who Play Video Game

KHOIROTUN NISAK, ROMDZATI..... 23

I-Costra: Innovation of Coconut Coir as Noise Barrier on Reducing Occupational Deafness Risk in Informal Industrial Sector

MOHAMAD MAULUDDIN EKA PUTRA, YULI PUSPITA DEVI, VIEVI RULDI, DINI RAHMA YANTI, MEIDA CHAIRUNNISA..... 26

Dhikr Therapy to Improving Sleep Quality for Post-Surgery Patient at Banten Indonesia

NENDEN ATIYANINGSIH, INDAH WULANDARI..... 29

Heavy Metal Phytoremediation Agents in Industrial Wastewater Treatment Using *Limnocharis flava* Callus

NINDYA PRAMESTI WARDANI, ANDIENA ELSAFIRA, GALUH PRIMADANI, LAILI CHOIRUL UMMA..... 33

Hipertension in Adult Age and Related Risk Factors

NUR CHAYATI, HENDRA GUNAWAN 38

A Systematic Review of Relationship between Green Tea Consumption and Improvement of Lipid Profile as Action Plan for Preventing Cardiovascular Disease (CVD) Development

PRIMA ALIFIAN H, FAHMI DIMAS ABDUL AZIS, FAIRUZA SYARFINA, SAFIRA ADILLA, APRILLIA TANTO.....42

The Impacts of Abusive Environment on Childrens Personality Development as Depicted in One Child

R. HARIYANI SUSANTI.....48

Effect of Empowerment of Cadres by Using Module for Changes in Nutritional Behavior in Pregnant Women in Dlingo, Bantul, Indonesia

SARI HASTUTI IINNURMAINI SEMBIRING.....60

Nurses Preparednesss for Disaster Management in Lampung Province, Indonesia

TIARA, EARMPOHN THONGKRAJAI.....66

The Effectiveness of Breathing Relaxation with Balloon Blowing Technique toward Physiological Changes of COPD Patients

TUNIK, ELSYE MARIA ROSA, AZIZAH KHOIRIYATI.....72

Cupping as Complementary Therapy for Patients with Hyperuricemia

UMI HANI, RITA WADI W77

A study on relationship among Health Status and Media Literacy among Elderly in Surin Province

WAREEWAN WIRIWANIJ, CHULARAT HOWHARN, WORANART PROMSUAN,SUPARANICH WASUKANCHANAWEJ80

Effect of Plasticizer and Chitosan Composition on the Plastic Biodegradable Quality from Starch Cassava Rubber (*Manihot Glaziovii*) as Alternative Plastic

YOUNGES PUTRA MERLY PARADIKA83

Education and Social Sciences

Preserving 'Kampung Pulo' Local Wisdom, Garut, Indonesia

AFNI FAUJIAH, HAFIDIN SYARIF HUDA, I GUSTI WAYAN ALBAR 89

An Assessment Agrarian Conflict Dynamics and Conflict Resolution Practices in Central Borneo

AGUSTIYARA 96

The Use of Verbal Rhetorical Devices to Construct Readers' Ideology in Online News Headlines

ANNISA LAURA MARETHA, ALLAN KONGTHAI.....103

The Study of Slip of Tongue Found in English Classroom Presentation Produced by Thai and Libyan Students at English Language and Letters Department

BAGUS DETRIANTO111

The Attitude and Future Perspective of 9th and 12th Grade English Program Students Towards Globalization in Khon Kaen City, Thailand

CHUANCHEN BI, NITHIKARN SANOAMUANG, VIROCHSAENGARON, BENOIT NADEAU, MATHEW FOLEY, SUTHAI KATIMA, PROYCHAI KLAKEYAN, KANNAPORN SANOAMUANG, YOSHIO MAKI, PHATARAPORN THAYASEREE, CHAIRAT WATTANACHOTIWA.....120

Linguistic Imperialism: The English/Asean Tension

ELEANOR KERFOOT.....127

Cultural Harmony: Uncovering the Acculturation of Buddhism and Kejawen in Kemiri Village, Temanggung Regency, Central Java, Indonesia

ERSYAH YULIA NUR.....131

The Local Wisdom of the Sakai Tribe in Mandau, Bengkalis Regency in Preserving Forest and River : Symbolic Interactionism

FINA MUSTA'INA, MUHAMMAD SANDRA, IKHSAN HIDAYAT, SITI KURAMIN, FANJI SUTEJA, MITA ROSALIZA.....135

Analysis of Exchange Rate Fluctuation Using Vector Error Correction Model (VECM) From 2010 to 2015

FITRA PRASAPAWIDYA PURNA, PUGUH PRASTYO MULYO, M ROQI AZZA BIMA.....143

The Changing of Community Media Dynamics in Indonesia a Case Study of Grabag Tv as a Media Literacy for Grabag Villagers

HANNA NURHAQIQI.....153

Student's Perception on the Use of Twitter to Learn English: a Preliminary Study

IANATUL KHOIRIYAH, NAILIS SA'ADAH SAFITRI158

Review Urgency Implementation of *Dalihan Na Tolu* Institutions in Legal Justice System in Indonesia

IKA KHAIRUNNISA SIMANJUNTAK164

Effects of Self-Assessment on Writing of Thai EFL Students in Different Groups of Learning Styles

JAKKRAPONG THONGPAI, PORANEE DEERAJVISET173

The Study of Philosophical Meaning of Kerawang Motifs on Gayo Ethnic Traditional Clothes, Aceh Province

JARWATI, SAHRI ARDALINA182

The Use of Google- Assisted Language Learning (GALL) on Improving Primary School Students' Verb-Noun Collocation Use in Sentence-Level Writing

JINTANA SRISUWAN, SUKHUM WASUNTARASOPHIT..186

Enhancing the Motivation of Low-Motivated Thai EFL Learners Through Self-Imaging Activities

KANOKWAN WONGTHONG, CHOMRAJ PATANASORN 195

South Korea E-Government Practice (Study Case: E-Government Implementation in Indonesia)

LUBNA SALSABILA, EKO PRIYO PURNOMO206

Parental Awareness of Teenagers Smoking Behavior in Yogyakarta and Bali

LUCKY HERAWATI214

Undergraduate Nursing Students' Experience Using the Combination of Flipped Classroom and Jigsaw Strategy

MARIA SILVANA DHAWO, CHRISNAWATI, IMELDA ILADJAR.....219

Akit Tribe and Existence of Mangrove Forest in Berancah Village, Bengkalis, Indonesia

MITA ROSALIZA226

| | | | |
|---|-----|---|-----|
| The Effectiveness of English Camp (A Model in Learning English as the Second Language) MUHAMMAD ASWAD | 234 | Implementation of Persuasive Strategy for Public Services in Private Enterprise RACHMAWATI NOVARIA, AHMAD SJAFFI, INDAH MURTI, NI MADE IDA PRATIWI | 303 |
| Students' Perceptions on the Use of English Vlog (Video Blog) to Enhance Speaking Skill NAILIS SA'ADAH SAFITRI, IANATUL KHOIRIYAH | 240 | The Meaningful Place: Transforming Taman Sari as City Park of Banda Aceh RAHMALIA, NURUL HIKMAH | 308 |
| Information Literacy in Rural Community: an Alternative Information Literacy Model in Development Countries NINIK ALFIYAH, ANISA SEPTIYO NINGTIAS, NURMA PANDWITA UTAMI | 248 | The Study of Speech Acts in Press Releases of International Technology Trade Fairs SASITHORN SAELOW | 315 |
| Types of Written Corrective Feedback: Overview of Teachers' Implementation in Indonesia NIRMA PARIS, SUTIDA NGONKUM, REZKIAWATI NAZARUDDIN | 255 | Empowering Livelihood of Disabled People Through Batik Village SIHAM MADIHAH | 321 |
| <i>Peruweren Systems: Local Wisdom Manifestations for the Gayo Peoples</i> NUR LAILIYA HARTANTI, ARMAYA AKBAR FITRA SIRAIT | 263 | Rechtsvacuum in the Capital Market Regulation in Indonesia, a Case: the Embezzlement of Customers Funds by PT. Sarijaya Permana Sekuritas.Tbk. SITI HATIKASARI | 325 |
| From Museum for Java Culture (Management Information System in Ullen Sentalu Museum, Yogyakarta) NURUL CHAMIDAH, DEDET ERAWATI, ENDAH NURHAWAENY | 265 | Interaction Strategies Used in an Online Learning Medium by Tertiary Level Students in English for Specific Purposes Course SOPIT JENPRADAB, ALLAN KONGTHAI | 333 |
| Local Tourism Promotion Through Multilingual Vlog in Garut, Indonesia PANDU PURWADI, AINI NOVIANTY, DEDEN ARDI NUGRAHA, YUANDA LESTARI | 272 | Service Quality in Public Sector Toward Surabaya Multi Media City (Case Study: Broadband Learning Centre Services in Taman Prestasi, Surabaya City) SRI MURYANI, PRASASTI ANJARWANI, LULUK DWI SASMITA, WILDAN TAUFIK RAHARJA | 343 |
| Memory Strategy Options in Collocation Learning Among EFL Learners PANSUPA PANCHOOJIT, SUKHUM WASUNTARASOPHIT | 277 | Images of Javanese Women in Patriarchal Culture Represented by Aisyah, a Character in Umar Kayam's Para Priyayi SRI WARSIDAH RAHMI | 348 |
| The Phenomenon of Demolition of Radio Bung Tomo Based on Law Number 11 in the year 2010 and City Regulation of Surabaya Number 5 in the year 2005 PARLAUNGAN IFFAH NASUTION; LENY YULYANINGSIH; LISDA BUNGA ASIH | 286 | Local Wisdom of Malay Community in the Coastal in the Utilization of Natural Resources (The Study Case of The Farmer of Sialang's Honey Bee in Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak of Riau Province) T. ROMI MARNELLY | 353 |
| Maduranese Meaning About Carok Case Study in Sampang Regency, Madura Island PURWATI AYU RAHMI | 291 | The Rising of <i>Ojek</i> Difa Positioning Difabel as Subject in Providing Inclusive Public Transportation Service for Yogyakarta Indonesia THERESIA OCTASTEFANI, BAYU MITRA ADHYATMA KUSUMA | 364 |
| Evaluating Effects of <i>Program Keluarga Harapan</i> (PKH) on School Attendance: Case Study of CCT in Indonesia PUTRI KEMALA DEWI, DYANTI RIZKIKA ANDANI, AMIRAH HADI AQILAH | 297 | | |

The Effects of Ethiopia's Investment Policy and Incentives on Smallholding Farmers

YONAYAD GURMU, SUKHUMVIT SAIYOSAPON,
WEERAKUL CHAIPHAR372

Engineering and Technology

Mocaf (Modified Cassava Flour), Cornmeal (Zea mays L.), and Jackbeen Flour (Canavalia ensiformis)-Based Analogue Rice as a Functional Food to Reduce Rice Consumption in Indonesia

ANIS SEPTIYANI SHOLICHAH, AMIRAHANIN NAFIAH, ISMIRA WIDIHASTUTI, ADIE BAYU PUTRA, ACHMAD RIDWAN ARIYANTORO382

Phytochemicals, Quality and Glycemic Response Fern Red Herbal (*Stenochlaena palustris*)

BERNATAL SARAGIH, HENOCH TEGAR PRAKOSO, ANTON RAHMADI, ASWITA EMMAWATI, ODIT FERRY KURNIADINATA391

The Effect of Citric Acid on Teak Leaves Anthocyanin Extraction Process (*Tectona grandis* L.) and The Teak Leaves Extract Proportion to The Physical and Chemical Syrup Characteristics

DEVI DWI SISKAWARDANI, SILVIA KHILMI, IRVAN RAMADHANA PUTRA, RIRIN AGUSTIN, AND SELVY TRISKIANA WISTA398

Bio-briquettes Innovation Co-FES (Coconut Fiber and Egg Shell) as the Eco-Friendly Fuel with Pressure Giving Methods for Indonesian Energy Fuels Challenge

ERIK PRIYANTO, SELVI LUTFIANA PUTRI.....403

Combustion and performance of DI diesel engines using biodiesel of kemiri sunan (*Reutealis Trisperma Airy Shaw*) as a alternative fuels

G. HAMDANA PUTRA, F. A. SETIO BUDI, A. Z. MUHAMMAD FATHALLAH411

Manufacturing Bioethanol from Gadung (*Dioscorea hispida*) through One Stage Distillation Unit

DELI KUSUMA WARDANI, NILA WULANDARI, YUNITA TRI ANDANI, MUHAMMAD ARIFIN.....420

Determination of Optimum Condition on Coal Desulfurization by Electrolysis Method

CHINDYKA KURNIA DEWI, MUHAMMAD MARCO SAYPUTRA, SEPTIANI WULANDARI AND YUDA PRATAMA, AZHARUDDIN,S.T., M.T.....424

Effect of Centrifugation to Inhibit Tea Cream Formation in Concentrated Black Tea

MUHAMMAD RAFIQ, PIYAPORN CHUEAMCHAITRAKUN, THEERAPONG THEPPAKORN.....428

The synthesis of activated carbon based waste mangrove propagule using microwave radiation and its application to adsorb Pb and Zn on electroplating industrial waste

NAILU SA'ADA TURROHMAH, RONI PUTERA MARDA, WIDI ASTUTI.....436

Optimizing Thermal Cracking Polystyrene: Waste Plastic to Produce Liquid Fuel – A Review

OCI OKTARINI, ADI AGUSTIANSYAH, MUHAMMAD ARIQ PERDANA, MUHAMAD FADIL TAUFIK.....440

A Finite Integration Method for a Time-Dependent Heat Source Identification of Inverse Problem

RAMA LESMANA, AREENA HAZANEE, ANIRUTH PHON-ON, JARUNEE SAELEE444

A Comparative Study of Green Technology in Cement Industry

RESTU KHOLIFATUL UMMI.....452

Technology of Catalytic Cracking Pyrolysis for Liquid Fuels Production from Waste Tires Using Acid Zeolite and Silica Catalysts

RIZKA NURDIANTI, REZA ARMANSYAH, HILMAN SAPUTRA, ERWANA DEWI.....464

Implementation of Spatial Hybrid in Sustainable City Growth in Urban Sprawl Periphery

Case Study: Border Area Surabaya with Sidoarjo Regency

DARMANSJAH TJAHJA PRAKARSA, SUKO ISTIJUNTO467

Feeding Habits of Asian Green Mussel (*Perna viridis*): A Case Study from Andaman Sea and Gulf of Thailand

TEUKU HARIS IQBAL, SUKREE HAJISAMAE, SUPAT KHONGPUANG.....480

Content List of Poster

Health Sciences

Description of Documentation of Nursing Care at Inpatient Ward in Banjarbaru idaman Hospital, Indonesia

TRISUSILOWATI, AGIANTO, MINARTI MANURUNG.....486

Education and Social Sciences

Decreasing the Number of Exporting Women Worker from Tulungagung by Using Tourism Package

DWI CAHYANI OCTAVIANI, LOURENZDITA NUR KENCANA DEWI, DESI SUSANTI487

The Dynamics of Chinese Language Studies in Vietnam's Universities

TRAN THI XOAN488

Engineering and Technology

Application of Banana Tuber Flour and Rice Barn Flour in Biscuit Crackers

NOVA SOLINA PURBA, BERNATAL SARAGIH, HADI SUPRAPTO489

Acceptance of Elementary School Children on Tilapia Fish and Sardinella Fish Flour Based Biscuits

SLAMET WIDODO, SAIFUDDIN SIRAJUDIN, FILIANOVA, NAHRIANA490



Health Sciences



Relation between Dehydration and Short Term Memory Function Impairment in College Students

¹Annisa Bunga Nafara, ²Mochamad Bahrudin, dr, Sp.S, ³Annisa' Hasanah, dr, M.Si

¹Medical Student, Medical Faculty of Muhammadiyah Malang University, Indonesia

²Lecturer Staff, Department of Neurology, Medical Faculty of Muhammadiyah Malang University, Indonesia

³Lecturer Staff, Department of Physiology, Medical Faculty of Muhammadiyah Malang University, Indonesia

E-mail: ¹annisabunga100@gmail.com, ²mochbahrudin1012@gmail.com, ³nisa_dr_umm@yahoo.com

ABSTRACT

According to a study in Malang city in 2013, short term memory impairment not only occur in elderly, but also in adolescence. Another study shows that 60,9% of college student in Gadjah Mada University indicated an involuntary dehydration. Losing minimum 1% of body fluid would affects brain function and cognition include short term memory function. True Experimental, Pretest and posttest with Control Group Design, 62 selected volunteers are divided into control /non-dehydration group and intervention/dehydration group (mild dehydration induced by 40 minutes treadmill in the speed of 5,6 km/h, and rest for 20 minutes). Body fluid loss at least 1%, measured by weight loss percentage. Wechsler Adult Intelligence Scale (WAIS) Digit span was used for the test instrument. Data was analyzed with Chi-Square test. Degraded posttest result indicated short term memory function impairment. 9,7% of sample with worse WAIS score in non-dehydration group and 48,8% of sample with worse WAIS score in dehydration group. Chi-Square test showed significance value of 0.001. Studies showed short term memory function impairment in intervention group was caused by the loss of at least 1% of body fluid after the exercise. Fluid Loss decreased cerebral blood flow (both volume and velocity), decreased the amount of cerebrospinal fluid, electrolyte and ion imbalance in the brain circulation and increased plasma osmolality which causes neuron shrinkage and lower brain volume (both cortex, substantia alba and ventricular system). In conclusion Dehydration is related to short term memory function impairment in college students.

Keywords: Dehydration; Memory; Students

I. INTRODUCTION

[1] Dehydration is the loss of body fluid from all compartments caused by the water intake is less than the need of fluid/loss of fluid from body. [2] Loss 1-3% of body fluid is indicated as mild dehydration. (Indonesian Health Minister, 2011). 44,5% adolescent are in the state of dehydration, [3] and only 40% male and 60% female who have adequate intake of fluid in daily basis. [4] College student is susceptible community to experience dehydration. 60,9% of college student in Gadjah Mada University were suffered from involuntary dehydration. In another side, college students are expected to get a good achievement on academic knowledge that need the process of cognitive function such as STM.

[5] Short term memory (STM) is the ability to memorize information for seconds or minutes in the certain time. [6] STM function is important to be evaluated because STM is the first process before an information is transferred to a long term memory storage (consolidation). [7] STM function impairment commonly occur in elderly (due to degenerative diseases), but recent study held in Malang showed that decrease of STM function also happen on adolescent and adult in high significant number.

[8] STM function is affected by many factors such as age, central nervous system diseases, history of head trauma, congenital abnormality, psychology, behavior and nutrition. A research showed that giving nutrition

therapy with 100 grams of dates for 6 days increase in STM function of elementary students, tested with Wechsler Intelligence Scale of Children.

[9] Sleep deprivation could decrease spatial learning and memory function in sleep deprived rat, and caffeine therapy intervention (4 weeks with low dose) improved these function, tested with Morris Water Maze.

[10] Dehydration have been proven to affect blood and serum in brain circulation which are lower hematocrit count, higher osmolality of plasma, lower H₂O, K⁺ and glucose level. These mechanism lead to the shrinkage of neurons that cause changes of brain volume in cortex, substantia alba, and hypothalamus. [11] Due to the low level of fluid in brain, it decrease the cerebral blood flow and velocity in carotid system that supply blood to the brain. [12] Beside the changes in blood supply, lower body fluid level also affect cerebrospinal fluid production follows the degrading of ventricle volume.

[13] Studies have been conducted to determine if mild dehydration would affect brain function performance. [14] The recent investigation used exercise and heat induced acute dehydration in 25 healthy woman with average age 23 years old showed higher plasma osmolality, degraded mood, lower concentration, headache symptom. [15] A year before, in 2011 the same procedure research was conducted with 26 men with the average age of 20, resulted higher plasma osmolality, degraded working memory and increased tension/anxiety and fatigue.

II. METHODS

A. Participants

Fully informed written consent was obtained from the subjects before the study. Sixty-two third year Medical student of Muhammadiyah Malang was selected by questionnaires to determine their mental and physical health, age (20-15 year old) and body mass index (18,5-24,9). Student who has or ever had history of renal diseases, neurologic diseases, head trauma, physiological disturbance and malnutrition is excluded from participation. 62 subjects was divided in two groups, intervention group and control group.

B. Experimental Protocols

One day before intervention, subject was instructed to have enough night sleep (5-8 hours), not doing hard physical activity, not to consume alcohol, coffee, electrolyte drink since 12 hours before intervention. To disguise the experimental conditions, the researcher was helped my 5 volunteers as the examiners test the subjects (body weight and STM test), and subjects was blind to their body mass and STM test. For the intervention group, on the morning of each intervention, body weight of subject was measured by volunteer, and then subjects held the STM pretest. After pretest, subject performed treadmill walking exercise 5,6 km/h, grade 5%, room temperature ($27,6 \pm 0,8$ °C) for 40 minutes non-stop. After exercise, subjects took 20 minutes to for rest, dry their skin and hair with paper towel, rested on a chair but didn't take water or food. After 20 minute rest, subject's weight was measured again. Subjects who lost $\geq 1\%$ of body weight ongoing posttest with the same instruction. Subjects who finished the posttest was given food and drinks, as the end of the experimental procedure. For the control group, subjects performed pretest immediately with no intervention and weight measure, and did posttest an hour after the pretest with no fluid intake restriction. Control group subject got the same instructions 12 hours before the test as well as intervention group.

C. STM Function Assessment

Wechsler Adult Intelligence Scale (WAIS) was used as the instrument for this study, which was Digit span backward auditory recall to assessed STM function. It consist of several digit of numbers and subject was instructed to repeat the number backward after the examiner, with the same speed (one second for each space and digit). it started from 2 digit numbers until 7 digit numbers. Score was determined by the last number of digit that subject can repeat fluently.

D. Statistical Analysis

With IBM SPSS v20.0, Two groups of data (intervention and control) was analyzed using Chi-Square 2x2 table (dehydration-non dehydration and decreased score-non decreased score). Due to variability in rate and extent of dehydration over the course of the dehydration and non-dehydration experiments, statistical comparisons for all dependent variables were conducted only when a volunteer attained a level of dehydration $\geq 1\%$ body mass loss. A criterion of $\geq 1\%$ was established, because this is the lowest level of dehydration that has been suggested as capable of altering cognitive function. A P value of ≤ 0.05 (2-tailed) was the criterion for significance.

III. RESULTS

Experiment was conducted in Brawijaya Sport Center, Cikampek road No. 1, Malang in 2 months. 100% of 31 subjects in Intervention group loss $\geq 1\%$ of weight, with mean body mass decreased was 1.733%, 1.02% minimum and 4.86% maximum (Table 1). 100% of intervention subjects fulfil the requirement of acute mild dehydration criteria which was expected. During intervention there was no unwanted symptom reported. Control group experienced no dehydration induction and no weight loss.

Table 1. Weight lost percentage based on age in intervention group

| Age (Year) | % Weight loss | | | | Total subject |
|------------|---------------|--------|--------|-----|------------------|
| | 1-1,5% | 1,5-2% | 2,5-3% | >3% | |
| 20 | 6 | 4 | 2 | 1 | 13 |
| 21 | 9 | 2 | 2 | - | 13 |
| 22 | 1 | 2 | - | 1 | 4 |
| 23 | 1 | - | - | - | 1 |
| Total | 17 | 8 | 4 | 2 | 31 |
| Subject | | | | | |

1% weight loss is equivalent with 1% body fluid loss in intervention subjects

STM function was tested to both groups. Normal score of WAIS Digit span Backward is ≥ 3 . The table showed after intervention was conducted total dehydration subjects with normal score (≥ 3) decrease from 24 subjects (pretest) to 19 subjects (posttest). Total subjects with degraded score (< 3) increase from 7 subjects to 12 subjects. Mean score for Pretest to posttest in intervention group decreased from 3.55 to 3.06. Based on age, subjects who was 20 years old and 21 years old experienced degraded mean score, while subjects who were 22 and 23 years old has constant mean score (Table 2).

Table 2. Wais digitspan backward test score on intervention group (dehydration)

| | Pre-test Score | | | | | | | Post-test Score | | | | | | |
|---------------|----------------|---|----|---|---|---|------|-----------------|---|----|---|---|---|-------|
| Age (Year) | 2 | 3 | 4 | 5 | 6 | 7 | Mean | 2 | 3 | 4 | 5 | 6 | 7 | Mean |
| 20 | 3 | 3 | 4 | 3 | - | - | 3,54 | 6 | - | 6 | 1 | - | - | 3,15* |
| 21 | 2 | 2 | 8 | - | 1 | - | 3,69 | 3 | 6 | 3 | 1 | - | - | 3,15* |
| 22 | 1 | 2 | - | 1 | - | - | 3,25 | 2 | - | 1 | 1 | - | - | 3,25 |
| 23 | 1 | - | - | - | - | - | 2 | 1 | - | - | - | - | - | 2 |
| Total subject | 7 | 7 | 12 | 4 | 1 | 0 | | 12 | 6 | 10 | 3 | 0 | 0 | |

Symbol * on posttest refers to degraded score indicated STM function Impairment.

Table 3. Wais digitspan backward test score on Control group (non-dehydration)

| | Pre-test Score | | | | | | | Post-test Score | | | | | | |
|---------------|----------------|----|----|---|---|---|------|-----------------|---|----|---|---|---|--------|
| Age (Year) | 2 | 3 | 4 | 5 | 6 | 7 | Mean | 2 | 3 | 4 | 5 | 6 | 7 | Mean |
| 20 | 2 | 5 | 5 | 1 | 1 | 1 | 3,80 | 1 | 4 | 6 | 2 | 1 | 1 | 4,06** |
| 21 | - | 5 | 4 | - | 1 | - | 3,70 | - | 4 | 3 | 2 | 1 | - | 4** |
| 22 | 1 | 1 | 3 | 1 | - | - | 3,66 | 1 | - | 2 | 2 | 1 | - | 4,33** |
| 23 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total subject | 3 | 11 | 12 | 2 | 2 | 1 | | 2 | 8 | 11 | 6 | 3 | 1 | |

Symbol ** on posttest refers to increased score indicated there was no indication of STM function Impairment.

Total of control subjects with normal score increase from 28 (pretest) to 29 subjects (posttest). While total of control subjects with degraded score decrease from 3 to 2 subjects. Mean score of pretest and posttest was increased in control group from 3.81 to 4.10. based on age, all age group (20, 21, 22 years old) showed increased mean score. (Table 3).

Quantitative description using Chi-Square, in intervention group, 16 subjects (51.61%) didn't show any degraded score and 15 subjects (48.39%) decreased in score. In control group, 28 subjects (90.32%) had not degraded score, and 3 subjects (9.68%) had degraded score. These showed that there are more dehydration subject experienced STM function impairment (48.39%) than non-dehydration subjects (9.68%). (Table 4) Chi-Square 2 tailed test showed significance of 0.001. (Table 5).

Table 4. Quantitative description of degraded and not degraded score in intervention and control group

| | Not degraded (%) | degraded (%) |
|--------------------------------|------------------|--------------|
| Control Group/Non-dehydration | 28 (90.32) | 3 (9.68) |
| Intervention Group/Dehydration | 16 (51.61) | 15 (48.39) |
| Total | 22 (71) | 18 (29) |

Table 5. statistical analysis with chi-square

| | Asymp. Sig (2-sided) |
|--------------------|----------------------|
| Pearson Chi-Square | 0,001 |

Significance value less than 0,05 showed significance relation between variable.

IV. DISCUSSION

There are more subjects in intervention group had lower posttest score of WAIS digit span STM test than control group. WAIS digit span test score indicated acute-reversible

STM function impairment due to dehydration ($\geq 1\%$ loss of body fluid).

[1] During treadmill exercise, epinephrine and norepinephrine hormones are secreted by the adrenal medullae. Energy demand of muscle cells increase, followed by increasing of metabolism rate. This process causes higher body temperature. The body needs to lose excessive amounts of heat produced by the active muscles. These hormones stimulate sympathetic autonomic nervous system to activate apocrine gland that produce sweat. Apocrine glands secrete body fluid, NaCl and urea from blood capillary to form sweat and release it through the skin pores.

[15] The findings of previous study was conducted with 26 healthy male with the same procedure and cognitive test using computer based test, showed that dehydration affect cognitive, mood, anxiety and higher plasma osmolality value (examined by urine specific gravity). [14] In the next year, this experiment was continued to examine 25 healthy women with the same procedure. This study showed significant impairment in mood state and headache complain while cognitive function was not affected in woman. [11] Another study used 2 hours ergocycle for dehydration induction in 10 healthy endurance-trained male subjects, resulted 3% body mass reduction, cerebral blood flow was examined and resulted lower blood volume in the brain, lower blood flow velocity in internal, external and common carotid artery, also lower blood flow velocity in middle cerebral artery.

[10] 15 subjects experienced 12 hours fluid restriction method for inducing dehydration showed decrease of Na^+ , K^+ , H_2O and glucose level (8.7 ± 6.8 mg/dl), higher plasma osmolality by 0,67% which caused cell shrinking and decreased brain volume (cerebral cortex, substantia alba and hypothalamus/thalamus). [12] 3 days dehydration diet method was conducted to induced dehydration on 6 subjects resulted 2.3% mean weight loss, decrease ventricle volume which leads to lower cerebrospinal fluid production by the fourth ventricle.

Despite the significance result in Chi-Square test, in this investigation, we see there are some subjects in control group that experienced STM function impairment as well as intervention group that did not experience STM function impairment. Some subjects showed adverse result from what was expected. These finding are caused by multiple confounding factors that beyond the control of researcher may affect the subject's STM function beside dehydration, which are [16]

Neuromodulator level (higher dopamine level could increase AMPA and NMDA receptor activity, adrenalin involves emotional aspect and it increase the effectivity of limbic system, higher corticosteroid stress hormone makes the memory is easier to re-call while prolonged stress could impair this function), habit or memorizing practice will ease the process of consolidation, [17] light exposure activates PAK1 (p21-activating kinase 1) and this enzyme modulates hippocampus-dependent memory, [18] sleep quality (90 minutes of nap and longer REM state duration were proved to have better short term memory function because prefrontal cortex circulation is increased during REM state of sleep), [19] air pollution (NO_2 level more than 20 pbb is related to worse memory and logical function, O_3 level higher than 49pbb is related to worse executive function, thickening of internal carotid artery which decrease cerebral blood flow, free radical on contamination in blood impairs fat, nucleic acid and neuron protein which lead to neuro inflammatory response, neurodegenerative and blood brain barrier damage), [20] person who used to do music training since 8 years old was proven to have better concentration ability, [21] extensive cognitive learning (magic trick, reading, studying color, motoric activity, video game, mediation) for 14 weeks showed increase of grey matter, especially in fronto-parietal region.

In conclusion, this study demonstrates that, in third year male medical students, mild dehydration of $\geq 1\%$ body mass loss induced result in adverse change in STM function assessed by WAIS backward digit span. Future studies should consider to control more confounding factors, determine the effect of chronic dehydration on cognitive function and to assess the effects of dehydration in cognitive function in at risk population such as elderly, diabetes patient, or stroke.

ACKNOWLEDGMENT

The Authors thank dr Irma Suswati, M. Kes as the Dean of medical faculty in the university of Muhammadiyah Malang for the support on this research, dr Mochamad Ma'roef, Sp. OG as Vice Dean 1, to examine this research with manuscript revision and submission, dr. Djaka Handaja, MPH as the chairman of the ethics commission, for ethical clearance approval. The authors wrote the manuscript and had primary responsibility for its final content. All authors read and approved the final manuscript.

REFERENCES

- [1] Guyton, Arthur C. Textbook of Medical Physiology. Philadelphia: Elsevier Inc. Unit V. Chapter 26. Urine formation by the kidney dan Unit IX. Chapter 46. Sensory receptor, neural circuit for processing information. pp. 307-604. 2012. In press.
- [2] Gustam. Risk Factor of Dehydration in Adolescent and Adult. Journal of Agricultural Institute Bogor. *Faktor*

- Risiko Dehidrasi pada Remaja dan Dewasa. Jurnal institut Pertanian Bogor.* pp. 27-66. 2012. In press.
- [3] Pego, C. Ferreira, et al. Total Fluid Intake and Its Determinants: Cross-sectional Surveys Among Adult in 13 Countries Worldwide. *Europe Journal of Nutrition* 54. 2015. In press.
- [4] Penggalih, Mirza Harapan Sakti titis, Zaenal Mutaqien Sofro, Eka Roshifita Rizqi, and Yuniko Fajri. Prevalence of Dehydration among Students in Gadjah Mada University. *Prevalensi Kasus Dehidrasi Pada Mahasiswa Universitas Gadjah Mada.* Pp. 3-10. 2013. Unpublished.
- [5] Syaifuddin. Human Body Physiology, *Fisiologi Tubuh Manusia.* Jakarta: Salemba Medika Publisher. 2009. In press.
- [6] Johnson, Michael D. Human Biology Concept and Current Issues. San Francisco: Pearson Education Inc. 2008. In press.
- [7] Tantomi, Achmad Iwan, Abdurrachman Omar Baabdullah, and Andri Sagita. Trend of Early Senility Phenomenon as an Suspect of Demensia Symptom. *Tren Fenomena 'PisiDi' (Pikun Usia Dini) Sebagai Dugaan Awal Gejala Demensia.* Journal of Islam Malang University. pp. 2-4. 2013. Unpublished.
- [8] Sitohang, Nur Asnah, and Farida Linda Sari Siregar. Effect of Nutrition Therapy Dates for Short Term Memory of Students at Elementary School 60 886 and 060 889. *Journal of Nursing and Health Care (JNHC)* Vol.2 No.2. Pp:87-89. 2015. In press.
- [9] Esmaeilpour, Khadijeh, Vahid Sheibani and Hakimeh Saadati. Caffeine Improved Spatial Learning and Memory Deficit in Sleep Deprived Female Rat. *Journal of Iranian Society of Physiology and Pharmacology* 121-129. Pp:123-127. 2015. In press.
- [10] Biller, A, et al. Responses of the Human Brain to Mild Dehydration and Rehydration Explored In Vivo by H-MR Imaging and Pectroscopy. *AJNR AM J Neuroradiol* 36:2277-84. Pp: 2279-2283. 2015. In press.
- [11] Trangmar, Steven J. et al. Dehydration Accelerates Reduction in Cerebral Blood Flow During Prolonged Exercise in the Heat Withpout Compromising Brain Metabolism. *American Physiological Society.* ISSN 0363-6135. Pp: H1600-H1603. 2015. In press.
- [12] Streitburger, Daniel Paolo, et al. Investigating Structural Brain Changes of Dehydration Using Voxel-Bsed Morphometry. Volume 7, Issue 8. Pp. 7. 2012. In press.
- [13] Lieberman, Harris R. Methods for Assesing the Effects of Dehydration on Cognitive Function. *Suplement Article Nutrition Reviews.* pp. 143-145. 2012. In press.
- [14] Armstrong, Lawrence E, et al., 'Mild Dehydration Effects Mood in Healthy Young Women'. *The Journal of Nutrition Ingestive Behavior and Neurosciences.* pp. 383-385. 2011. In press.
- [15] Ganio, Matthew S, et al., 'Mild Dehidration Impairs Cognitive Performance and Mood of Men. *British Journal of Nutrition.* pp. 1536- 1541. 2011. In press.
- [16] Stern, Sarah A, and Cristina M Alberini. Mechanisms of Memory Enhancement. *National Institute of Health.* 2014. In press.
- [17] Shan Li-Li, et al, Light Exposure Before Learning Improves Memory Consolidation at Night. *Scientific Report* 5:15578. Pg. 3-8. 2015. In press.
- [18] Lau, Esther Yuet Ying Lau, Mark Lawrence Wong, Kristy Nga Ting Lau, Florence Wai Ying Hui, Chia-Huei Tseng. Rapid-Eye-Movement- Sleep (REM) Associated Enhancement of Working Memory Performance after a Daytime Nap. *Journal Pone* 0125752 University of Hongkong. Pg.3-12. 2015. In press.
- [19] Gatto, Nicole M, et all. 2015. Components of Air Pollution and Cognitive Function in Middle Aged and Older Adults in Los Angeles. *Neurotoxicology National Institute of Health* 40: 1-7/ doi:10.1016 pg. 5-8. In press.
- [20] Suarez, Lidia. Shalini Elangovan, and Agnes Au. 2016. Cross-sectional Study on the Relationship Between Music Training and Working Memory in Adult. *Australian Journal of Psychology.* DOI: 10.1111/ajpy.12087. pp. 40-42. In press.
- [21] Koch, Kathrin, Tim Jonas Rees, Oana Georgina Rus and Claus Zimmer. 2015. Extensive Learning is Associated with Gray Matter Changes in the Right Hippocampus. *NeuroImage Journal, Elsevier Inc.* DOI:10.1016. Pp. 2-5. Inpress.

Tackling Indonesia's Diabetes Challenge with Indonesian Traditional Herbs as Dietary Supplementation to Reduce Development of Cardiovascular Complications: Promotion The Use of Natural Product

Aprillia Tanto, Fairuza Syarfina, Fahmi Dimas Abdul Azis, Prima Alifian H, Safira Adilla

Faculty of Pharmacy
Airlangga University
Surabaya, Indonesia

E-mail address: aprilliatanto@gmail.com

ABSTRACT

Indonesia's biggest challenge in the next 10-15 years is non-communicable diseases (NCD) like cardiovascular and diabetes with its complication which are accounted for nearly 50 percent of deaths in the country. As of 2014, Indonesia's diabetes population was the fifth largest in the world, International Diabetes Federation (IDF) predicted more than 14 million Indonesians will suffer diabetes in 2035. Dietary supplementation can reduce the risk of diabetes development and its cardiovascular complication. Indonesia as a country that is rich in natural sources has the opportunity to maximise the utilization and benefits of its natural products. Indonesian traditional herbs have been used to treat disease and nowadays they are being scientifically developed for therapies. These natural products are considered to have potentials in delaying the development of diabetes and its complications and to be able to cure the metabolic abnormalities using a variety of mechanism. Comprehensive literatures were used to review Indonesian traditional herbs used in the management of diabetes. An online database research from Elsevier, Science Direct, and PubMed was conducted to find literature on herbs growth in Indonesia that improves health outcomes in the development of diabetes and its cardiovascular complication. Indonesian traditional herbs such as *Momordica charantia*, *Trigonella foenum-graecum*, *Tinospora cordifolia*, *Zingiber officinale*, *Allium sativum* have been proven to produce significant improvement of blood glucose, 2 hours post load glucose, A1C, LDL-C, blood pressure level as compared with control which have antidiabetic and cardioprotective activity with various mechanism of action. Indonesian scientifically proven traditional herbs have great potentials to be used as dietary supplementation to reduce the development of diabetes and its complication. It can be the investment to tackle the global challenge for reducing deaths caused by diabetes and its cardiovascular complication.

Keywords: Indonesia, Diabetes, Cardiovascular, Complication, Herbs, Dietary

I. INTRODUCTION

Indonesia's biggest challenge in the next 10-15 years is non-communicable diseases (NCD) like cardiovascular and diabetes with its complication which are accounted for nearly 50 percent of deaths in the country. As of 2014, Indonesia's diabetes population was the fifth largest in the world, International Diabetes Federation (IDF) predicted more than 14 million Indonesians will suffer diabetes in 2035 [1].

Traditional herbs have an important role in primary health care of individuals in many developing countries e.g. Indonesia. In Indonesia, traditional herbs, known as "Jamu", have been taken since long time ago and still popular on the Indonesian health care system. Traditional herbs are highly taken by

people because it is cheaper than western medicines [2].

Dietary supplementation of traditional herbs can reduce the risk of diabetes development and its cardiovascular complication. Indonesia, as a country that is rich in natural sources, has the opportunity to maximise the utilization and benefits of its natural products. Indonesian traditional herbs have been used to treat disease and nowadays they are being scientifically developed for therapies. These natural products are considered to have potentials in delaying the development of diabetes and its complications and to be able to cure the metabolic abnormalities using a variety of mechanism [3].

II. DIABETES AND COMPLICATION

Diabetes mellitus is a chronic illness and define as "a metabolic disorder of multiple etiologies

characterized by chronic hyperglycemia with disturbances in carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both” [4]. In general, there are four classification of diabetes mellitus: type 1 diabetes mellitus, type 2 diabetes mellitus, gestational diabetes, and specific type of diabetes due to other cause [5]. Type 1 diabetes mellitus is insulin-dependent diabetes which occur due to destruction of β -cell of pancreas. Type 2 diabetes mellitus (non-insulin-dependent) is insulin resistance due to progressive loss of insulin secretion. Type 2 diabetes mellitus (T2DM) is the most common diabetes mellitus in people with diabetes and the result of physical inactivity and excess body weight. Gestational diabetes is diabetes that occur in pregnancy [5].

Hyperglycemia is a pathological condition characterized by elevated blood glucose levels. It affects the mortality rate and caused the reduction of blood flow to the central nervous system area. It is a manifestation most commonly associated with such disease conditions as pre-diabetes and diabetes mellitus. The hyperglycemia seems to be involved in diabetic macrovascular complications [6,7,8]. It is a leading cause of nephropathy, retinopathy, and accelerated atherosclerosis [9].

In patients with T2DM, the frequency of atherosclerosis disease is increasing and causing the myocardial infarction, stroke, and gangrene in the lower part of the extremities. Increased risk of atherosclerosis in T2DM patients due to several reasons, those are the occurrence of hypertension and hyperlipidemia. The T2DM condition itself is the risk factor of atherosclerosis and has a synergistic activity with other risk factors that can increase the event of atherosclerosis. In T2DM, hypertension often occur on patient with obesity and those with insulin resistance [8].

The central pathologic mechanism of cardiovascular disease is the process of atherosclerosis that causes narrowing the arterial wall in the body. Other risk factors are as follows: (a) changes in lipoprotein composition in T2DM make the particles in the blood vessels become more atherogenic; (b) procoagulant state in T2DM patients such as increased blood clotting factor and platelet aggregation; (c) proatherogenic changes in blood vessel walls; (d) proatherogenic changes in blood vessel walls due to

the direct effect of blood hyperglycemia like the sedimentation of protein glycation only happened in microvascular complication; (e) pro-inflammation associated with the occurrence of insulin resistance [8,10].

III. INDONESIAN HERBS WITH ANTIDIABETIC AND RELATED BENEFICAL EFFECTS

Nowadays, there has been increasing use of complementary and alternative medicine among global society. There were studies reported that almost 8% respondents with diabetes use alternative medicine. Another survey in specific diabetes populations two-thirds and 49% of Hispanic population in South Texas used alternative medicine [11].

Part of plants and its derivatives have been used in traditional medicine around the world including Indonesia [11]. As a tropical country with thousands of islands, Indonesia is gifted with a rich and unique biodiversity [3]. Indonesia is the world's second largest biodiversity after Brazil and home for about 90% of medicinal plants species found in Asia [11]. The area of Indonesian tropical forests is very wide and contain about 80% of the world's medicinal plants. About 40 million Indonesian people have historically used the herbal medicines (known as “jamu”) for the treatment of diseases and dietary supplement [3]. This biodiversity rich have potential for future development of medicinal plants [12]. There are many herbal plants suggested for diabetes and its complication as follow :

A. *Momordica charantia*

Momordica charantia (MC) or usually called bitter melon is a flowering vine from the family of Cucurbitaceae. It is a tropical plant that is widely cultivated in Asia, India, East Africa, and South America for its intensely bitter fruits that are commonly used in cooking and as a natural remedy for treating diabetes. Bitter melon is one of the most beneficial plants for treating diabetes [13,14].

Many parts of the plant had been used by the public for treating the T2DM, those parts were the leaves, the stem, and the green fruits or seed. It also often being extracted into a dry powder and consumed in the form of capsules, aqueous extract, powdered dried fruit or fresh juice. The main constituents of MC which are believed to have the antidiabetic effects and possessed

insulin-like chemical structure and properties are momocharin and momordicin. The momordicin belongs to alkaloid group which is responsible for the bitter taste of MC and momocharin belongs to glycoproteins group that possessed hypoglycemic properties [13,14].

Many research reported the various mechanism of bitter melon as the antidiabetic agent for the patient with T2DM. It is believed to exert the hypoglycemic effect by involving the stimulation or inhibition of the key enzymes of metabolic pathways, it stimulates the key enzymes of hexose monophosphate pathway, increases the utilization of peripheral and skeletal muscle glucose, inhibits the intestinal glucose uptake and hexokinase activity, suppress the gluconeogenic enzymes, and maintain the normal function of islet β -cells [15].

Rahman *et al* (2015) conducted a randomized control trial in human that proved the hypoglycemic and antiatherogenic effects of bitter melon compared to glibenclamide in T2DM patients [15]. The randomized controlled trial, double blind, and parallel group trial were involving 95 participants and divided into 3 groups. The first group received bitter melon 2 g/day, the second group received bitter melon 4 g/day, and the third group received glibenclamide 2.5 mg/day for 10 weeks. The result showed that there was significant reduction in A1C levels among patients in group 1, 2, and 3 from baseline to end-point after receiving the interventions. In group 1 and 2 which received bitter melon, the changes in 2 hours plasma glucose after oral glucose tolerance test (OGTT) were not statistically significant but the changes in fasting plasma glucose (FPG) were significant. Group 1 and 2 showed improvement in the changes of the blood lipid levels from baseline to end point but were not statistical significant except for triglyceride (TG), it also showed the favorable changes in body weight and systole blood pressure at the endpoint. The improvement on diabetes associated CV risk factor was better by bitter melon than glibenclamide, it might show that bitter melon less hypoglycemic but more antiatherogenic than glibenclamide [15].

A pilot study was conducted by Trakoon-osot *et al* in 2013 also showed that there was a significant reduction in A1C levels by consuming bitter melon for 16 weeks [16]. The participants were divided into two groups and each group received 6 g/day of bitter melon dried-fruit pulp or placebo. After 8 weeks of the treatment the reduction of A1C from baseline in the group which was taking bitter melon was greater than

that of the placebo group. Although the result of this study showed there was no significant reduction in FPG, but it proved that bitter melon was beneficial on the glycemic control and potential systemic complication of T2DM [16].

B. *Trigonella foenum-graecum*

Trigonella foenum-graecum L. seeds (TFG), family Fabaceae, known as fenugreek, halba or helba, kelabat is commonly used in cooking especially for curry [17]. TFG seeds or its extracts can be used for their nutritive and therapeutic values in many parts of the world, especially in China, Egypt, India and Middle Eastern countries [17]. The present study has found TFG seeds can be used for diet supplementation on blood glucose and lipid profile in T2DM patients. Active compounds of fenugreek included soluble fiber, saponins, trigonell, diosgenin, and 4-hydroxyisoleucine. Marker compound for hypoglycemic activities have mainly been attributed to dietary fiber and saponin, alkaloids, amino acids, galactomannan, nicotinic acid, vitamins and minerals [17]. Soluble fibers like galactomannan help in slowing down digestion affect blood sugar reduction and absorption of carbohydrates [19]. Saponins form large mixed micelles with bile salts and significantly reduce cholesterol by increasing fecal excretion of bile salts, thereby inhibiting cholesterol absorption [19]. 4-Hydroxy leucine found in these seeds stimulates insulin secretion in pancreas and lowers absorption of glucose [19].

Shakour *et al* (2003) reported that fenugreek seed dietary supplements may be beneficial to T2DM patients and its compliance to reduce blood glucose [18]. The subjects divided to 5 groups, 25 patients included control group receiving diets recommended by the diabetes institute with no other diet supplementation, group received boiled fenugreek seeds as diet supplementation, group received germinated fenugreek seeds as diet supplementation, group received fenugreek seeds in powder form for diet supplementation, and group received defatted fenugreek seeds for diet supplementation. All fenugreek was given in a daily dose of 15 g. The results told that there was no significant change in blood glucose, fructosamine and lipid profile. But, there was a significant change in improved serum cholesterol, serum TG, Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL). And also there was a significant change that reduced

postprandial blood glucose level in all groups that received the fenugreek seed supplement [18].

Kumar *et al* (2015) reported that fenugreek seeds can control T2DM in the form of soaked in hot water [19]. The subject divided into two equal groups included Group took 5 grams fenugreek seeds powder into 250 g yoghurt and other group used the same amounts into one quart hot water before lunch and dinner (10 grams per day) for two months. The results of 18 patients (11 consumed fenugreek in hot water and 7 in yoghurt) were studied. Only group that received fenugreek seeds was significantly reduced in Fasting Blood Glucose (FBG) (25%), TG (30%) and VLDL (30.6%) [19].

C. *Zingiber officinale*

The rhizome of the plants *Zingiber officinale* (Zingiberaceae) commonly known as ginger (“Jahe” in Indonesia) is extensively used as spicy and medicine. In ancient medical use as “Jamu” in Indonesia, ginger has been used for gastrointestinal disorder. Ginger supplementation improves glucose homeostatis in T2DM by decreasing insulin resistance and improve glucose tolerance despite of the mechanism remains uncertain. Ginger’s major chemical compound include phenolic compound gingerol and shogaol take role of carbohydrate metabolism and hyperglycemia with α -amilase and α -glucosidase inhibition [20]. In vivo study trial showed the ability of gingerol to decrease blood sugar and oxidative stress due to superoxide dismutase stimulation. Treatment with gingerol resulted in plasma insulin level [21].

There are some scientific evidences on the effects of ginger on the blood levels. A randomized clinical trial with double-blind, placebo controlled conducted by Shidfar *et al* [20] on 45 old patients with T2DM [23]. The subject received 3 g of powdered ginger daily in 3 months. The study’s results showed that after intervention the reduction of FBG (-19.41 ± 18.83) and A1C (-0.77 ± 0.88) were significantly different ($p < 0.001$). In another randomized, double-blind, placebo-controlled, clinical trial conducted by Khandouzi *et al.* (2015) [22]. 41 T2DM subjects recruited have given oral administration of ginger powder for 12 weeks at dose of 2 g per day caused significant ($p=0.000$) reduction in the levels of FBG (-19.41 ± 18.83) [22].

Inflammation is play major role in pathogenesis of its secondary complications. A studies conducted by

Shidfar *et al.*, (2015) there is significantly reduction ($p < 0.001$) of C-reactive protein (CRP) as inflammation marker ($-2,78 \pm 4,07$) in 45 old patients with T2DM received 3 g of powdered ginger daily in 3 months [20]. These evidence supported by trials that conducted by Azimi *et al.*, [23] the CRP decrease significantly ($p < 0.05$) within group (5.65 ± 0.1 to 5.55 ± 0.1).

D. *Tinospora cordifolia*

Tinospora cordifolia (Willd.) Hook.f. & Thomson (TC) is a medicinal plant which has the potential for anti-diabetic and anti-dyslipidemic because of its high alkaloid and terpenes content. Its stem contains some medicinal substances berberine, palmatine, tembetarine, magnoflorine, tinosporin, tinocordifolin [24].

The alcoholic extract of stem has anti diabetic and antihyperlipidemic effect and it has been demonstrated in Wistar rats for its effect. The potential effect of TC extract is better to reduce diabetic-dyslipidemia and extrapancreatic and intrapancreatic activities are known to take part in the anti-diabetic effect. There is no available study on humans after knowing its great potential on the glycemic and lipemic profile in animal models. The stem of TC has great potential to control dyslipidemia and T2DM [24].

The study from this article recruited 100 patients T2DM from the Medicine and Diabetic OPD of King George Medical University who met the inclusion criteria (age of patients between 30-60 years and a known case type 2 diabetes mellitus with taking oral antidiabetic drugs). The exclusion criteria for the patients were type 2 diabetes patients with insulin, type 1 diabetes and gestational diabetic patients, patients above 60 years, patients with nephropathy, neuropathy, retinopathy, and any other chronic complication. 100 patients who met the inclusion criteria were randomly divided into two groups, group A and B. Patients in group A were treated as control (continued to take oral antidiabetic drugs) and patients in group B were given extract of TC in tablet form as add-on therapy alongside the oral antidiabetic drugs. A TC tablet contained 500 mg extract was given three times a day with meals for 6 months. Each patient body mass index (BMI), blood pressure, age, weight, weight was recorded for baseline characteristics [24].

The results of this study after 6 months: the baseline parameters were not statistically significant

(similar from the beginning of this study); the reduction of FBG levels was statistically significant in group A ($p \leq 0,05$) and highly significant in group B ($p \leq 0,005$); the reduction of post prandial blood glucose levels was statistically significant in group A and B ($p \leq 0,05$); the reduction A1C of group B was more statistically significant than group A [24].

59 patients who met the inclusion criteria (T2DM and dyslipidemia and were taking oral antidiabetic drugs and statins) were recruited. The exclusion criteria of this study were patients with secondary complication, gestational diabetes, and type 1 diabetes. The patients divided into 2 groups, intervention group ($n=29$) and control group ($n=30$). The intervention group accepted 250 mg of encapsulated mature stem of TC and took it before meals twice daily alongside the dyslipidemia and antidiabetic drugs, but the control group only took the oral dyslipidemia and antidiabetic drugs for 2 months. All parameters were checked before and after 2 months of study to evaluate the effect of the intervention. The results of this study after 2 months: the reduction of CRP was statistically significant; the A1C was similar with the beginning of the study; average blood glucose (ABG) was decreased and reached nearly statistically significant [25].

E. Allium sativum

Allium sativum (AS), known as garlic or “bawang putih” in Indonesian, had commonly used both as cooking flavor agent and medicine. AS contains a variety of sulfur-containing compounds, amino acids, vitamins, and minerals. Some of the sulfur-containing compounds were allicin, ajoene, S-allylcysteine, S-methylcysteine, diallyl disulfide and sulfoxides [26]. As a dietary supplement, AS is available in many preparation, such as dehydrated garlic powder, garlic oil (steam-distilled), garlic essential oil (etherextracted), aged garlic extract (AGE), and garlic oil macerate, and each form contains a markedly different set of compounds that affect the chemical properties, including the active compound. Garlic powder are the most commonly reported and used in garlic preparation, that has active compound alliin derivatives, allicin [27].

AS has shown potential effect on the anticoagulant activity, antioxidant, antihyperlipidemic, antihypertensive, antiatherogenic, and antiglycemic

effect [4]. The effect of AS on antiglycemic and antihyperlipidemic were not apparent. The probable mechanism AS in antiglycemic effects is increased insulin secretion, insulin sensitivity, enhancement of beta cell in pancreas by activating regeneration of the cell, and also antioxidant effect of AS [28,29]. As antihyperlipidemic agent, AS inhibiting hydroxymethylglutaryl-CoA reductase (HMG-CoA reductase), by allicin [29].

Effect AS on the diabetic and hyperlipidemia has been reported in many previous clinical study. A control study ($n=210$) with garlic tablet contain 300, 600, 900, 1200 and 1500 mg/ day for 24 week has shown significant reduction FBG and improvement in A1C [30]. This garlic tablet compared to placebo and metformin. The higher the dose of garlic, the higher the effect in FBG and A1C. Other study showed significant reduction in FBG, mean total cholesterol, LDL-C, TG, and improvement in High Density Lipoprotein cholesterol (HDL-C) after 24 weeks of treatment [29]. In this study, garlic combined with typical antidiabetic agent. The meta-analysis showed that the administration of garlic resulted in a significant reduction in FBG concentrations [28]. Few adverse effects had reported in clinical studies using AS consist of gastrointestinal discomfort and nausea, allergic contact dermatitis, rhinitis, bloating, headache, dizziness [29,30].

Overall, garlic showed significant effect on prevention diabetes mellitus and its complication as single treatment and with combination with antidiabetic agent, and may be a potential addition in the treatment of patients with T2DM and hyperlipidemia.

IV. CONCLUSION

Indonesian scientifically proven traditional herbs have potentials to be used as dietary supplementation to reduce the development of diabetes and its complication. Indonesian traditional herbs such as *Momordica charantia* called bitter melon; seeds of *Trigonella foenum-graecum*, rhizome of *Zingiber officinale*; stems of *Tinospora cordifolia*; roots of *Allium sativum* are represent the herbs which are most frequently used as herbal medicine. These plants have been studied intensively up to clinical trial stage for their activity in reducing diabetic development and its secondary complications. The mechanisms of action of these plants in reducing diabetic factors have been

studied in molecular level lately. Therefore, it can be the investment to tackle the global challenge for reducing deaths caused by diabetes and its cardiovascular complication.

REFERENCES

- [1] IDF, 2015. IDF Diabetes Atlas. 7th ed. Belgium pp. 12-15, 17.
- [2] Usia, T., Iwata, H., Kadota, S. and Tezuka, Y., 2006. Mechanism-based inhibition of CYP3A4 and CYP2D6 by Indonesian medicinal plants. *Journal of ethnopharmacology*, 105(3), pp.449-455.
- [3] Woerdenbag, H.J. and Kayser, O., 2014. Jamu: Indonesian traditional herbal medicine towards rational phytopharmacological use. *Journal of herbal medicine*, 4(2), pp.51-73.
- [4] Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO Consultation. Part 1: Diagnosis and classification of diabetes mellitus. Geneva, World Health Organization 1999 (WHO/NCD/NCS/99.2).
- [5] ADA, 2016. Standards of Medical Care in Diabetes-2016: Classification and Diagnosis of Diabetes: Volume 39 Supplement 1: S14.
- [6] Kalsbeek, A., Bruinstroop, E., Yi, C.X., Klieverik, L.P., La Fleur, S.E. and Fliers, E., 2010. Hypothalamic control of energy metabolism via the autonomic nervous system. *Annals of the New York Academy of Sciences*, 1212(1), pp.114-129.
- [7] Delaere, F., Magnan, C. and Mithieux, G., 2010. Hypothalamic integration of portal glucose signals and control of food intake and insulin sensitivity. *Diabetes & metabolism*, 36(4), pp.257-262.
- [8] Rhee, S.Y. and Woo, J.T., 2011. The prediabetic period: review of clinical aspects. *Diabetes & metabolism journal*, 35(2), pp.107-116.
- [9] Yamagishi, S.I. and Imaizumi, T., 2005. Diabetic vascular complications: pathophysiology, biochemical basis and potential therapeutic strategy. *Current pharmaceutical design*, 11(18), pp.2279-2299.
- [10] Funk J. L., Feingold K. R., 2006. Disorders of The Endocrine Pancreas. In: McPhee S. J., Vishwanath R. L., Ganong W. F., Lange J. D. (Eds). *Pathophysiology of Disease 2nd Ed: An Introduction to Clinical Medicine*. United States pp. 432, 433, 435-442.
- [11] Yeh, G.Y., Eisenberg, D.M., Kaptchuk, T.J. and Phillips, R.S., 2003. Systematic review of herbs and dietary supplements for glycemic control in diabetes. *Diabetes care*, 26(4), pp.1277-1294
- [12] Komindr, S., 2013. Pilot study: hypoglycemic and antiglycation activities of bitter melon (*Momordica charantia* L.) in type 2 diabetic patients. *Journal of Pharmacy Research*, 6(8), pp.859-864.
- [13] ICS-UNIDO. 2003. Medicinal Plants and Their Utilization.
- [14] Joseph, B. and Jini, D., 2013. Antidiabetic effects of *Momordica charantia* (bitter melon) and its medicinal potency. *Asian Pacific Journal of Tropical Disease*, 3(2), pp.93-102.
- [15] Singh, J., Cumming, E., Manoharan, G., Kalasz, H. and Adeghate, E., 2011. Medicinal chemistry of the anti-diabetic effects of *Momordica charantia*: active constituents and modes of actions. *The open medicinal chemistry journal*, 5(1).
- [16] Rahman, I.U., Khan, R.U., Rahman, K.U. and Bashir, M., 2015. Lower hypoglycemic but higher antiatherogenic effects of bitter melon than glibenclamide in type 2 diabetic patients. *Nutrition journal*, 14(1), p.13.
- [17] Trakoon-osot, W., Sotanaphun, U., Phanachet, P., Porasuphatana, S., Udomsubpayakul, U. and Kalsbeek, A., Bruinstroop, E., Yi, C.X., Klieverik, L.P., La Fleur, S.E. and Fliers, E., 2010. Hypothalamic control of energy metabolism via the autonomic nervous system. *Annals of the New York Academy of Sciences*, 1212(1), pp.114-129.
- [18] Delaere, F., Magnan, C. and Mithieux, G., 2010. Hypothalamic integration of portal glucose signals and control of food intake and insulin sensitivity. *Diabetes & metabolism*, 36(4), pp.257-262.
- [19] Rhee, S.Y. and Woo, J.T., 2011. The prediabetic period: review of clinical aspects. *Diabetes & metabolism journal*, 35(2), pp.107-116.
- [20] Yamagishi, S.I. and Imaizumi, T., 2005. Diabetic vascular complications: pathophysiology, biochemical basis and potential therapeutic strategy. *Current pharmaceutical design*, 11(18), pp.2279-2299.
- [21] Funk J. L., Feingold K. R., 2006. Disorders of The Endocrine Pancreas. In: McPhee S. J., Vishwanath R. L., Ganong W. F., Lange J. D. (Eds). *Pathophysiology of Disease 2nd Ed: An Introduction to Clinical Medicine*. United States pp. 432, 433, 435-442.
- [22] Yeh, G.Y., Eisenberg, D.M., Kaptchuk, T.J. and Phillips, R.S., 2003. Systematic review of herbs and dietary supplements for glycemic control in diabetes. *Diabetes care*, 26(4), pp.1277-1294
- [23] Komindr, S., 2013. Pilot study: hypoglycemic and antiglycation activities of bitter melon (*Momordica charantia* L.) in type 2 diabetic patients. *Journal of Pharmacy Research*, 6(8), pp.859-864.
- [24] Neelakantan, N., Narayanan, M., de Souza, R.J. and van Dam, R.M., 2014. Effect of fenugreek (*Trigonella foenum-graecum* L.) intake on glycemia: a meta-analysis of clinical trials. *Nutrition journal*, 13(1), p.7.
- [25] Abdel Shakour, S., Ibrahim, H.S., Mohamed, E.M. and Yamani, M.Y., 2003. Hypoglycemic effect of fenugreek seeds in type 2 diabetes mellitus: clinical study. *Scientific Medical Journal*, pp.117-127.
- [26] Kumar, K., Kumar, S., Datta, A. and Bandyopadhyay, A., 2015. Effect of fenugreek seeds on glycemia and dyslipidemia in patients with type 2 diabetes mellitus. *International*

- Journal of Medical Science and Public Health*, 4(7), pp.997-1000.
- [20] Shidfar, F., Rajab, A., Rahideh, T., Khandouzi, N., Hosseini, S. and Shidfar, S., 2015. The effect of ginger (*Zingiber officinale*) on glycemic markers in patients with type 2 diabetes. *Journal of Complementary and Integrative Medicine*, 12(2), pp.165-170.
- [21] Semwal, R.B., Semwal, D.K., Combrinck, S. and Viljoen, A.M., 2015. Gingerols and shogaols: important nutraceutical principles from ginger. *Phytochemistry*, 117, pp.554-568.
- [22] Khandouzi, N., Shidfar, F., Rajab, A., Rahideh, T., Hosseini, P. and Taheri, M.M., 2015. The effects of ginger on fasting blood sugar, hemoglobin a1c, apolipoprotein B, apolipoprotein aI and malondialdehyde in type 2 diabetic patients. *Iranian journal of pharmaceutical research: IJPR*, 14(1), p.131.
- [23] Azimi, P., Ghiasvand, R., Feizi, A., Hariri, M. and Abbasi, B., 2014. Effects of cinnamon, cardamom, saffron, and ginger consumption on markers of glycemic control, lipid profile, oxidative stress, and inflammation in type 2 diabetes patients. *The review of diabetic studies: RDS*, 11(3), p.258.
- [24] Mishra, S., Verma, N., Bhattacharya, S., Usman, K., Himanshu, D., Singh, P., Anjum, B. and Verma, N., 2015. Effect of *Tinospora cordifolia* as an add-on therapy on the blood glucose levels of patients with type 2 diabetes. *International Journal of Basic & Clinical Pharmacology*, 4(3), pp.537-541.
- [25] Roy, K., 2015. *Tinospora cordifolia* stem supplementation in diabetic dyslipidemia: an open labelled randomized controlled trial. *Functional Foods in Health and Disease*, 5(8), pp.265-274.
- [26] Sobenin, I.A., Nedosugova, L.V., Filatova, L.V., Balabolkin, M.I., Gorchakova, T.V. and Orekhov, A.N., 2008. Metabolic effects of time-released garlic powder tablets in type 2 diabetes mellitus: the results of double-blinded placebo-controlled study. *Acta diabetologica*, 45(1), pp.1-6.
- [27] Kwak, J.S., Kim, J.Y., Paek, J.E., Lee, Y.J., Kim, H.R., Park, D.S. and Kwon, O., 2014. Garlic powder intake and cardiovascular risk factors: a meta-analysis of randomized controlled clinical trials. *Nutrition research and practice*, 8(6), pp.644-654.
- [28] Hou, L.Q., Liu, Y.H. and Zhang, Y.Y., 2015. Garlic intake lowers fasting blood glucose: meta-analysis of randomized controlled trials. *Asia Pacific journal of clinical nutrition*, 24(4), pp.575-582.
- [29] Ashraf, R., Khan, R.A. and Ashraf, I., 2011. Garlic (*Allium sativum*) supplementation with standard antidiabetic agent provides better diabetic control in type 2 diabetes patients. *Pak J Pharm Sci*, 24(4), pp.565-570.
- [30] Ashraf, R., Khan, R.A. and Ashraf, I., 2011. Effects of garlic on blood glucose levels and HbA1c in patients with type 2 diabetes mellitus. *Journal of Medicinal Plants Research*, 5(13), pp.2922-2928.

***Averrhoa carambola* Benefits to Reduce Hypertension**

Jenita Doli Tine Donsu, Harmilah, Maria H. Bakri

Health Polytechnic of Health Ministry Yogyakarta

Jl. Tata Bumi No. 03 Banyuraden, Gamping, Sleman, Yogyakarta

donsu.tine@gmail.com

ABSTRACT

Hypertension is a common health problem in the community. Uncontrolled hypertension can lead to degenerative diseases, such as congestive heart failure, kidney failure, and vascular disease. Hypertension is called the "silent killer" because it is symptomatic that cause strokes and heart disease. Therefore, patients with hypertension should have adherence to effectively control and obtain regular double intervention either farmako and other alternatives such as complementary therapies. The purpose of this study was to determine the star fruit (*Averrhoa carambola*) as a complementary therapy is effective in reducing systolic and diastolic blood pressure in patients with essential hypertension. This study begins with empirical studies and phytochemical test on star fruit in a laboratory Pharmacy Polytechnic Bandung, and worthy of ethics and the MoU between the Ministry of Health Polytechnic Yogyakarta and Bandung. This research method using experimental design, the type of Quasi experimental, with "Pre-test and Post-test Control Group Design without" 80 respondents in Community Health Centre Sleman Yogyakarta and Sukajadi Bandung. The results of the analysis of different test by Mann-Whitney that there was no significant difference to the decrease in blood pressure between the groups and slices of star fruit juice in systolic blood pressure $p = 0.197 (> 0.05)$ and diastolic $p = 0.061 (> 0.05)$. Results Wilcoxon analysis, significantly there is a decrease in systolic blood pressure $p = 0.000 (< 0.05)$ and diastolic $p = 0.000 (< 0.05)$ after given juice and slices of starfruit. Phytochemical screening observed in the flavonoid as an amplifier arrangement of capillaries, decrease the permeability and fragility of blood vessels, as well as having bioactive compounds such as diuretics which can promote blood circulation, and thus can reduce the risk of heart and cardiovascular disease as well as preventing hypertensive disorders. Starfruit juice as a complementary therapy known to be effective in lowering systolic and diastolic blood pressure in patients with essential hypertension.

Keywords: *Averrhoa carambola*, Complementary therapies, Hypertension

I. BACKGROUND

Hypertension is a major contributor to the short life expectancy of African- Americans. Lifestyle changes as an intervention have not been developed especially for African-American young men. Hypertension in the community requires lifestyle changes as a form of educational development and knowledge of hypertension. It needs careful planning in doing intervention that is by doing intensive medical examination and this requires quality test to focus group. That is, any intervention can be done on a quality basis focusing on a specific group with a particular program. The community will be very enthusiastic in improvement programs such as improving individual guidance, building good relationships/ communication, and defining what is felt by people who have hypertension, so that the program can guarantee the reduction of hypertension in the community. Similarly with prevention, can be preventive program on the development of hypertension in the community, namely by approaching to the community through the evaluation of the effectiveness of lifestyle changes (Margaret, S., et al. [1]; Junaidi [2]; Hebert, P.L., et al. [3]; Ramanath, K.V. and Venkappa, K.R. [4])[1,2,3,4].

The relative risk of hypertension depends on the amount and severity of the modifiable and unmodifiable risk factors. Factors that can not be modified include genetic factors; Age, gender, and ethnicity. While the factors that can be modified, among others, stress obesity and nutrition (Junaidi [2]; Hebert, P.L., et al. [3]).

In overcoming hypertension drugs are needed, and the best ones are those derived from herbs as complementary therapies. The use of medicinal plants is intended to maintain health, maintain stamina and treat disease. Star fruit has its own benefits because it contains nutrients per 100 grams (3.5 oz), namely: Calories 36 cal; Protein 0.4 g; 0.4 g fat; 8.8 g carbs; Fiber 4 g; Calcium 12 mg; Phosphorus 1.1 mg; Iron 170 mg; Vitamin A 0.03 IU; Vitamin B1 35 mg; Vitamin C 90 mg; Water 86 g. Thus star fruit provides health benefits of lowering hypertension, lower cholesterol, facilitate defecation, lose weight, overcome liver disorders, reduce fever, and over throat disturbances. In addition to cheap and easy to obtain, traditional medicines derived from plants are considered to have far less dangerous side effects compared with synthetic or chemical drugs [5,6,7].

The main content in star fruit such as water and vitamin C is an antioxidant, in this case is the antioxidant of flavonoid polyphenols; Such as epithelekin, quercetin, gallic

acid. In general, antioxidants serve to counteract and fight free radicals that enter the body, especially to maintain cell survival. So that cells can play an active role in the body's metabolism also against free radicals as the cause of cell damage. Nutrition in starfruit also has a great effect in maintaining the immune system so free from virus attack especially influenza virus, help to overcome inflammation, improve blood vessel system and elasticity of heart blood vessel so give positive effect on blood pressure that is by lowering high blood pressure. While the benefits of other star fruit is still a lot that has not been revealed, but most star fruit is used in the world of beauty that is facial treatment, it becomes interesting because it is also star fruit star as anti aging (Widjaja E.A. et al. [5]; Hariana [6]; Peraturan Kepala Badan Pengawas Obat dan Makanan RI [7]).

Experiments on mice with the provision of fruits including starfruit have been done by Khoo. Experiment by giving star fruit juice causes an effective reaction of the mice (Khoo, Z.Y., Teh, C.C., Rao, N.K., Chin, J.H. [8]). In this study experiments star fruit performed on healthy people first then in patients with hypertension.

The purpose of this research is to know the form of star fruit (*Averrhoa carambola*) as complementary therapy is effective in lowering systolic and diastolic blood pressure in patients with essential hypertension. Knowing the benefits of *Averrhoa carambola* as a complementary therapy to maintain blood pressure remains stable in healthy people so that the body feels healthier and fitter.

The benefits of this study; As a complementary therapy in lowering blood pressure in essential hypertensive patients, as a natural therapy for the community in preventing and maintaining basic health without significant side effects, as a form of environmental empowerment that increases the potential of natural ingredients users in the form of garden cultivation.

II. REFERENCE REVIEW

Hypertension or high blood pressure is a common complaint in the community. Based on the prevalence, the incidence of hypertension is increasing from year to year. In addition, many patients with hypertension who have not received treatment should, or have been treated but his blood pressure is still not falling as expected. It is also possible for hypertensive patients with accompanying diseases and complications to increase morbidity and mortality (Margaret, S., Monica, O., Anna, A., Laurie, W., Thomas, M. [1]).

The Causes of Essential Hypertension are usually multifactorial arising from the interaction of various risk factors. The risk factors are as follows: 1) Risk factors, such as advanced age, female gender, family history of hypertension, dietary salt intake, stress, obesity, dyslipidemia (high LDL cholesterol), smoking, and diabetes

mellitus; 2) sympathetic nervous system; 3) The balance of vasodilation and vasoconstriction of blood vessels; 4) Angiotensin Renin System (Junaidi [2]).

Hypertension is often not accompanied by symptoms (asymptomatic), so sometimes someone is less aware with the disease. But usually, hypertension that has caused symptoms is hypertension that has been more severe. Among the symptoms are headache, neck pain, nocturia (frequent night urination), dizziness (oyong), tinnitus (audible voices, etc.), epistaxis (nosebleeds), etc. If any of these symptoms are present, it is advisable to consult a Puskesmas doctor to begin treatment. Actually this hypertension can be controlled. The most effective way is to reduce the risk factors above. Lifestyle modification and low-salt and low-fat diets are also highly recommended. Regular light exercise is also very helpful, such as aerobic exercise at least 3 times a week for 30 minutes, avoid smoking (Junaidi [2]).

Star fruit can also provide a number of benefits either as a source of consumption or as a medicine. Parts that can be utilized from sweet star fruit plants, among others, leaves, flowers, roots, and of course the fruit star fruit. Benefits/ benefits of star fruit to treat various diseases in humans, including: thrush and bleeding gums, high blood pressure, skin on the skin, facial acne, whooping cough, improve the functioning of the digestive system, overcome inflammatory problems in the rectum, reduce tooth pain, and cure paralysis (Widjaja EA, Rahayuningsih Y, Rahajoe JS, Ubaidillah R, Maryanto I, Walujo EB, Semiadi G. [5]). Based on the above study, the hypothesis in this study is "The form of star fruit (*Averrhoa carambola*) as an effective complementary therapy to reduce blood pressure in patients with essential hypertension"

III. METHOD

The study was conducted at several health centers in Sleman district of Yogyakarta and Sukajadi Health Center of Bandung. The research stages before the intervention were literature study, empirical test and phytochemical test. Intervention is done for 5 weeks. Materials and tools used; Star fruit, stethoscope and tensi meter. The experimental Quasi research design, with "Pre-test and Post-test Design without Control Group [9]. The total sample size was 80, consisting of 20 samples of healthy people and 60 samples of hypertensive patients (30 juice interventions and 30 iris fruit interventions). In 20 healthy individuals, a descriptive analysis and 60 intervention samples were performed using statistical analysis of Mann-Whitney and Wilcoxon. Overall, observational technique with qualitative data recording was performed on 80 respondents.

IV. RESULTS

Table 1. Characteristics of respondents of hypertension by age and gender

| Variable | Category | Juice | | Slices | |
|----------|----------|-------|------|--------|------|
| | | f | % | f | % |
| Age | <46 | 7 | 23,3 | 8 | 26,7 |
| | >46 | 23 | 76,7 | 22 | 73,3 |
| Gender | Male | 8 | 26,7 | 13 | 43,3 |
| | Female | 22 | 73,3 | 17 | 56,7 |

Based on the above table, age > 46 years most 23 people (76.7%) in the juice group and in the slice 22 people (73.3%). 22 women (73,3%) were the most sex group in the juice group and in the group the most were 17 female (56.7%).

Table 2. Mean result of systolic blood pressure reduction and diastolic group of juice and slices of star fruit.

| Blood Pressure | Mean Rank | Mann-Whitney | ilcoxon W | p |
|----------------|-----------|--------------|-----------|-------|
| 1 Systolic | | | | |
| Juice | 33,33 | 365,000 | 830,00 | 0,197 |
| Slices | 27,67 | | | |
| 2 Diastolic | | | | |
| Juice | 28,15 | 379,500 | 844,50 | 0,061 |
| Slices | 32,85 | | | |

The results of different test analyzes with Mann-Whitney (different test of two independent groups) that there was no significant difference to the decrease between juice group and sliced star fruit at systolic blood pressure $p=0,197$ ($> 0,05$) and diastolic $p=0,061$ ($> 0,05$).

Table 3. Results of pre and post blood pressure measurements systolic and diastolic groups juice and slices of star fruit

| No | Blood Pressure | Mean Rank | p |
|----|----------------|-----------|-------|
| 1 | Systolic | | |
| | Pre | 0,00 | 0,000 |
| | Post | 30,00 | |
| 2 | Diastolic | | |
| | Pre | 0,00 | 0,000 |
| | Post | 28,50 | |

Based on the above table, Wilcoxon analysis results significantly there is a systolic decrease after being given star fruit juice and sliced star fruit. Measurement of pre-test and post-test with $p=0,000$ ($<0,05$). This means that there is a decrease in systolic blood pressure between pre-test and post-test. Similarly, a decrease in diastolic blood pressure with $p=0,000$ ($<0,05$).

Descriptive analysis results on 20 healthy respondents concluded that the provision of juice and slices of star fruit can increase the freshness of the body and maintain blood

pressure stability. The results of qualitative analysis of 80 respondents concluded the first week intervention of about 12% complained about stomach and diarrhea, but could be controlled by honey, but in the second week until the fifth week without complaint.

V. DISCUSSION

Literate and phytochemical studies that flavonoids in plants have four functions: 1) As color pigments, 2) Physiological and pathological functions, 3) Pharmacological activities, and 4) Flavonoids in food. Pharmacological activity is thought to be derived from the routine (flavonol glycosides) used to strengthen the capillary arrangement, decrease the permeability and fragility of the blood vessels, etc. Gabor states that flavonoids can be used as drugs because they have a variety of bioactivities such as anti-inflammatory, anti-cancer, anti fertility, antiviral, anti diabetic, antidepressant, diuretic, etc (Sun, Q., & Chou, G. [10]).

In respondents with normal blood pressure, there was no significant difference in systolic blood pressure. Giving juice or sliced star fruit on the first 10 minutes after the intervention was not there increase or decrease in blood pressure for 7 days. While on the diastolic measurements given juice or sliced star fruit for seven consecutive days, the results of pre-test and post-test measurement at minute 30 found significant differences.

Supporting Ayodale's research, the physiological problem of essential hypertension tends to be inflexible in people with further age, so this has an impact on the level of insufficient sensitivity. Older hypertensive patients have reduced the responsiveness of the blood vessels so that intervention is delayed (Ayodele, E., Alebiosu, Olutayo, C. Salako, B.L.[11]). In this study most respondents at age above 46 years, so there is a slow tendency in the acceptance of intervention due to arterial stiffness, so that in the first 10 minutes there was no significant change. Changes occur after 30 minutes of juice or slices of star fruit. Some respondents complained of slight nausea and frequent urination on the first day to day two, but the intervention continued until the seventh day. No complaints affect the decline in health, so a little nausea and more frequent urination is considered as an adjustment factor.

Hypertension is a multi factorial disease that arises because of the interaction of various factors. With age, blood pressure will also increase after the age of 45 years, the arterial wall will experience thickening due to the accumulation of collagen substances in the

muscle layer, so that the blood vessels will gradually narrow and become stiff. Systolic blood pressure increases as the elasticity of the large blood vessels diminishes in age to the seventh decade while diastolic blood pressure increases until the fifth and sixth decades then settle or tend to decrease. Increased age will cause some physiological changes in old age to increase peripheral resistance and sympathetic activity (Schwartz, I. F., et al. [12]).

The results of literature study that the most prominent vitamin of star fruit is vitamin C, which amounts to 45 to 57% of needs per day. In addition, there are small amounts of vitamins A, E, and B complexes such as folate, niacin, pyridoxine, riboflavin, and thiamine in it. The fruit is called as star fruit in Western countries is also a source of minerals such as phosphorus, zinc, iron, magnesium, calcium, and potassium. High content of vitamin C in star fruit serves to help the body fight germs and common infections. Vitamin C also includes a natural antioxidant that can protect the body from free radicals along with other antioxidants and flavonoids such as quercetin, epicatechin, and gallic acid. The total content of this polyphenol reached 143 mg /100. In general, antioxidants serve to counteract and fight free radicals that enter the body, especially to maintain cell survival. So that cells can play an active role in the body's metabolism also against free radicals as the cause of cell damage. Nutrition in star fruit also has a great effect in maintaining the immune system so free from virus attack especially influenza virus, help to overcome inflammation, improve blood vessel system and elasticity of heart blood vessel so that give positive effect to blood pressure that is by lowering high blood pressure. While the benefits of other star fruit is still a lot that has not been revealed, but most star fruit used in the world of beauty that is facial treatment, it is interesting because it is also star fruit star as anti aging premise (Widjaja E.A. et al. [5]; Hariana [6]; Peraturan Kepala Badan Pengawas Obat dan Makanan RI [7]).

VI. CONCLUSION

1. Star fruit juice is known to have an effect on decreasing systolic and diastolic blood pressure in patients with essential hypertension
2. Star fruit slices are known to have an effect on systolic and diastolic blood pressure reduction in patients with essential hypertension
3. Based on phytochemical results known fresh star fruit contains flavonoid compounds with high

fiber, an effect on the decrease in blood pressure in patients with essential hypertension.

4. Averhoa carambola can keep blood pressure within normal limits and excellent health so that one can enjoy a healthy condition with optimal stamina, thus one can enjoy a healthier longer to avoid premature aging.

REFERENCES

- [1] Margaret, S., Monica, O., Anna, A., Laurie, W., Thomas, M., (2013). Heart of hypertension project: Development of a community-based prevention program for young African American men. *Progress in community health partnerships*, 7. 2, 163-169.
- [2] Junaidi, Iskandar. (2010). *Hipertensi (Pengenalalan, pencegahan, dan pengobatan)*. Jakarta : PT Bhuana Ilmu Populer
- [3] Hebert, P.L., Sisk, J.E., Tuzzio, L., Casabianca, J.M., Pogue, V.A., Wang, JJ., Chen, Y., Cowles, Ch., McLaughlin, M.A., (2012). Nurse-led disease management for hypertension control in a diverse urban community: a randomized trial. *Journal General Internal Medicine*, 27, 6, 630–9.
- [4] Ramanath, K.V., Venkappa, K.R. (2013). Study the impact of clinical pharmacist provided patient counseling on hypertension management in rural Indian population, *Archives of Pharmacy Practice*, Vol. 4, Issue 1 Jan-Mar 2013.
- [5] Widjaja EA, Rahayuningsih Y, Rahajoe JS, Ubaidillah R, Maryanto I, Walujo EB, Semiadi G. (2014). *Kekinian Keanekaragaman Hayati Indonesia*. LIPI Press, Kementerian Lingkungan Hidup dan Bappenas.
- [6] Hariana, Arief. (2008). *Tumbuhan Obat dan Khasiatnya*. Jakarta, Penebar Swadaya.
- [7] Peraturan Kepala Badan Pengawas Obat dan Makanan RI No. 12 (2014) Tentang Persyaratan Mutu Obat Tradisional
- [8] Khoo, Z.Y., Teh, C.C., Rao, N.K., Chin, J.H., (2010). Evaluation of the toxic effect of star fruit on serum biochemical parameters in rats. *Faculty of Pharmaceutical Sciences, UCSI University, Cheras, 56000, Kuala Lumpur, Malaysia*, Vol 6, 22, 120-124.
- [9] Shadish, W.R., Cook, Th.D., Campbell, D.T. (2001). *Experiential and Quasi Experimental for Generalized Causal Inference*, Houghton Mifflin Company, USA.

- [10] Sun, Q., & Chou, G. (2015) Isoflavonoids from *Crotalaria albida* Inhibit Adipocyte Differentiation and Lipid Accumulation in 3T3-L1 Cells via Suppression of PPAR-[gamma] Pathway: e0135893, *PLoS One*, Vol. 10, 8, 1-13.
- [11] Ayodele, E., Alebiosu, Olutayo, C. Salako, B.L. (2014). Differential control of systolic and diastolic blood pressure in blacks with essential hypertension. *Journal of The National Medical Association*. Vol. 96, 24-86.
- [12] Schwartz, I. F., A. Grupper, T. Chernichovski, O. Hillel, A. Engel, D. Schwartz, et al. 2011. Hyperuricemia Attenuates Aortic Nitric Oxide Generation, through Inhibition of Arginine Transport, in Rats. *Journal of Vascular Research*. Vol. 48:252-260.

Implementation of Diabetic Foot Ulcer Prevention Program in the Provincial Hospital, Pontianak, West Borneo, Indonesia

¹Kharisma Pratama, ²Nichapatr Phutthikhamin

¹Lecturer of School of Nursing Muhammadiyah Pontianak, West Borneo, Indonesia

²Lecturer of Department of Nursing Science, KhonKaen University, KhonKaen, Thailand

Corresponding author HP: +62 82255914494

KP: kharisma@stikmuhtk.ac.id

NP: thithi@kku.ac.th

ABSTRACT

DFU is a popular foot disorder that increases from year by year. DFU affects quality of life, and it increases morbidity and mortality, also incurs a substantial economic burden for society, patients and their families. The aim of this study to implement the evidence based practice of DFU prevention program in DM patients in Pontianak, West Borneo, Indonesia. This study used Stetler Model of Research Utilization to Facilitate EBP. DFU prevention program is the package consist of tools for data collection and tools for outcome evaluation. The researcher used Nursing competency questionnaire for evaluating the competency of nurses in DFU prevention program in DM patients. The questionnaire consists of 20 statements that related to the step of DFU prevention. Results/Findings: The researcher recruited 19 articles related DFU prevention from literature review. DFU prevention program consists of risk assessment, risk stratification or categorize and foot care based on risk category. Out of 40 nurses who implemented DFU prevention program, there are 20 nurses (50%) having a good competency, 14 (35%) having a satisfactory competency, and 6 (15%) having poor competency. This study found that mostly of nurses has a good competency in implementing the DFU prevention program. In other hand, there are still the nurses who has not reached a satisfactory.

Keywords: Diabetes mellitus, Diabetic foot, Foot ulcer, Prevention.

I. BACKGROUND

Diabetic foot ulcer (DFU) is a common complication of diabetes mellitus (DM) that increases from year by year Aalaa et al. [1]. DFU affects quality of life, and it increases morbidity and mortality, also incurs a substantial economic burden for society, patients and their families (Khalil et al. [3]). DFU increases from year by year (Aalaa et al. [1]). There were 15% of DM patients who had DFU during their lifetime (Yazdanpanah, Nasiri and Adarvishi [4]). The prevalence of DFU in Indonesia is approximately 15% (Purwanti [5]) and the incidents among DM patients are 29 times (Hastuti, Soeharyo and Tony [6]).

The ideal treatment of DFU prevention includes regular foot inspection, risk foot assessment, transfers knowledge related risk for DFU and early detect risk of DFU, appropriate DFU intervention.

The DM patients suffering from DFU need a long treatment period for wound healing process and it would expend the wound cost. The patients need to

spend approximately 15 - 23 USD per visit. Additionally, the routine care is perceived lack of addressing the occurrence of DFU among DM patients. Nurses use diabetic foot risk category at DM clinic, but the guidelines for DFU prevention was not available. This study aimed to develop the guidelines for DFU prevention in DM patients. The guidelines for DFU prevention is very important because it would help nurses to early detect DFU in DM patients and it would save cost for DM patients if DFU can be prevented.

II. METHODS

This study design was based on the conceptualization of the Stetler mode [7] of research utilization to facilitate evidence based practice. The Stetler model consists of preparation phase, validation phase, comparative evaluation/decision making phase, translation/application phase, and evaluation phase. This study was conducted in an IPD of Provincial hospital, Pontianak, West Borneo, Indonesia. Subsequently, 40 nurses were considered as target population for implemented the program. The inclusion criteria were as follows: 1) being registered nurse,

2) having working experience in taking care of DM patients at least a year. The study instruments consist of DFU prevention program and nursing competency for DFU prevention. The DFU prevention program consists of three major parts, namely: diabetic foot risk assessment, diabetic foot risk classification, and diabetic foot care intervention. The nursing competency for DFU prevention consists of 20 statement which related to the step of DFU prevention. Nurses get score "1" if they do each of statements, and get score "0" if they do not. Total range score 10-20. If score is more than 75% (15 - 20), it will be regarded as good, if score is 50-70% (10-14) it will be regarded as satisfactory and if score less than 45% (<9) it will be regarded as poor for competency for foot care.

III. RESULTS

A. Demographic data of the nurses

The average age of the nurses who worked in IPD of provincial hospital was 30.4 (SD=5.5) years old and ranged from 24 to 43 years old. 85% the nurses were dominantly female. Most nurses from earned diploma degree (90%). The average years of working experience with DM patients was 6.3 (SD=2.6). Only two nurses had wound care certificate (10%).

B. Implementation of the DFU prevention Program

Preparation phase. goal of study had been determined. The goal was implementation of the theDFU prevention program. The sufficiency findings of research articles supported to reach of the goal. The articles were found in multiple sources including Cochrane, Pubmed, Cinahl, and Ovid by keywords such as diabetic foot ulcer/DFU, DFU prevention, risk assessment, diabetic risk category, and diabetic foot care.

Validation phase. 19 research articles had been recruited, there were four research articles excluded. Using the guideline for research critique adapted from Melnyk and Fineout-Overholt [8], the level evidence of articles had been analyzed and critiqued. Nine articles were level 1 (Amstrong, D. G., et al. [9]; Cisneros [10]; Lavery, et al. [11]; Lincoln, N. B., et al. [12]; Le Master et al. [13]; Fujiwara et al. [14]; Gerhater, M. A., et al. [15]; Bus, S.A [16]; Ulbrecht, S.J. [17]) and 10 articles were level 4 (Yusuf, S., et al. [18]; Boyko, E. J., et al. [19]; Leese, G. P., et al. [20]; Leese, G. P., et al. [21]; Parliani [22]; Nather, A., et al. [23]; Monteiro, S.M. and Riberio, M. D. [24]; Monteiro, S. M. et al. [25]; Monteiro, S.M. et al. [26]; Kishore, S., et al. [27].

Comparative evaluation/decision making phase. In this phase the research findings were drafted for DFU prevention program. Three nurses who expert in DM and DFU had analyzed and considered that the DFU prevention program was practical. The DFU prevention program can be seen in table 1-3.

Translation/application phase. All of the nurses involved in training how to apply the DFU prevention program. All nurses had ability in implementing the DFU prevention program in DM patients.

Evaluation phase. Nurses competency for DFU prevention program was assessed by questionnaire. The S-CVI nursing competency DFU prevention was 1.0. Then, the internal consistency of nursing competency DFU prevention was assessed using KR 20 coefficient in 20 nurses. The internal consistency is 0.80. There were 40 nurses who implemented DFU prevention program, there were 20 nurses (50%) having a good competency, 14 (35%) having a satisfactory competency, and 6 (15%) having poor competency. The nurses with poor performance were retrained until they passed and met the satisfaction level.

C. Discussions

Most of the nurses who implemented the DFU prevention program had satisfaction level of performance. Only six nurses who had not reached the satisfaction level and were trained by the nurses. Another possible explanation is that working experience in taking care of DM patients and training certificate of wound care are also factors supported the nurse's ability. In this study, the average years of working experience with DM patients was 6.3 (SD=2.6). There was 10% of nurses who had wound care certificate. In this study, six nurses who did not pass in the first training were the nurses who do not have wound care certificate and have less experience in taking care of DM patients. The study finding of Blegen, Vaughn, & Goode (2001, cited in McHugh & Lake, 2010) found that a higher proportion of nurses with ≥ 5 years of experience was associated with fewer errors. Similarly, Clarke, Rockett, Sloane, and Aiken (2002, cited in McHugh & Lake, 2010) found that low mean experience was associated with incidences/ errors.

IV. CONCLUSION AND RECOMMENDATION

The DFU prevention program have been implemented. The DFU prevention program is useful and significant for nursing practice. The researcher has not evaluated the DM patients after implementation of the guidelines for DFU prevention. Therefore, further study should evaluate the result of implementation of the guidelines for DFU prevention in DM patients.

DECLARATIONS

Authors' contributions

All authors meet at least one of the following criteria and have agreed on the final version: 1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content.

Acknowledgements

We thank all the staff of the Institute Nursing of Muhammadiyah Pontianak, West Borneo Indonesia, Faculty of Nursing, KhonKaen University, Thailand, the province and city hospital of Pontianak, West Borneo, Indonesia.

Ethics approval and consent to participate

The study protocol was approved by the KhonKaen University Ethics Committee for Human Research based on Declaration of Helsinki and the ICH Good Clinical Practice Guidelines.

Consent for publication

Not applicable

Competing interests

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

- [1] Aalaa, M., O Tabatabaei, M., M Sanjari, M Peimani, and MR Mohajeri T. Nurses' role in diabetic foot prevention and care; a review. *Journal of Diabetes & Metabolic Disorders* 2012, 11 (24)
- [2] Brem, H., Sheehan, P., Rosenberg, H.J., Schneider, J.S. & Boulton, A.J.M. Evidence Based Protocol for Diabetic Foot Ulcer. *Plastic and reconstructive surgery* 2006 117 (7), 193S-209S
- [3] Khalil, S.H.A., A. Zaki., A. Abdel, R., M.H. Megallaa., N. Gaber., H. Gamal., & K.H. Rohoma. Prevalence of diabetic foot disorders and related risk factors among Egyptian subjects with diabetes. *Journal of Primary Care Diabetes*; 2014
- [4] Yazdanpanah, L., Nasiri, M., Adarvishi, S. Literature review on the management of diabetic foot ulcer. *World J Diabetes* 2015 6(1): 37-53.
- [5] Purwanti, Okti Sri Analisis. Faktor resiko Ulkus Kaki Diabetic Pada Pasien Diabetes di Rumah Sakit Dr. Moewardi (Analysis of factors of foot ulcer on diabetes mellitus pasien in Dr. Moewardi Hospital). Master Thesis 2013. University of Indonesia, Depok [Indonesia].
- [6] Hastuti., Rini, T., Soeharyo, and Tony Faktor- faktor resiko luka kaki diabetes pada diabetes pasien (The risk factors of diabetic foot ulcer in diabetes patients). Master Thesis 2008. Diponegoro University Semarang [Indonesia].
- [7] Stetler. Updating the Stetler Model of research utilization to facilitate evidence-based practice. *Nurs Outlook* 2001;49:272-9.
- [8] Melnyk and Fineout-Overholt. *Evidence-based Practice in Nursing & Healthcare: A Guide to Best Practice* 2015. Wolters Kluwer. Lippincott, Williams & Wilkins.
- [9] Armstrong, D. G., et al. Skin Temperature Monitoring Reduces the Risk for Diabetic Foot Ulceration in High-risk Patients. *The American Journal of Medicine* 2007, 120, 1042-1046.
- [10] Cisneros, L.L. Evaluation of neuropathy ulcer prevention program for patients with diabetes. *Rev Bras Fisioter*, São Carlos 2010, v. 14, n. 1, p. 31-7.
- [11] Lavery, et al. Re-evaluating How We Classify the Diabetic Foot: Restructuring the International Working Group's Diabetic Foot Risk Classification. *Diabetes Care* 2007., 3-8
- [12] Lincoln, N. B., et al. Education for secondary prevention of foot ulcers in people with diabetes: a randomised controlled trial. *Diabetologia* 2008, 51:1954-1961 DOI 10.1007/s00125-008-1110-0
- [13] LeMaster, et al. Effect of Weight-Bearing Activity on Foot Ulcer Incidence in People With Diabetic Peripheral Neuropathy: *Feet First Randomized Controlled Trial*. *Phys Ther* 2008 ;88(11):1385-98.
- [14] Fujiwara., et al. Beneficial effects of foot care nursing for people with diabetes mellitus: an uncontrolled before and after intervention study. *Journal of Advanced Nursing* 2011 67(9), 1952-1962. doi: 10.1111/j.1365-2648.2011.05640.
- [15] Gershater, M.A., Pilhammar, E., Apelqvist, C.J., Roijer, A. Patient education for the prevention of diabetic foot ulcers. *EDN Autumn* 2011. Vol. 8 No. 3. 102-107.
- [16] Bus, S.A. Effect of Custom-Made Footwear on Foot Ulcer Recurrence in Diabetes. *Diabetes Care* 2013, 36:4109-4116
- [17] Ulbrecht, S.J. Prevention of Recurrent Foot Ulcers With Plantar Pressure Based In-Shoe Orthoses: The Careful Prevention Multicenter Randomized Controlled Trial. *Diabetes Care* 2014 2014;37:1982-1989
- [18] Yusuf, S., et al. Prevalence and Risk Factor of Diabetic Foot Ulcers in a Regional Hospital, Eastern Indonesia. *Open Journal of Nursing* 2016, 6, 1-10
- [19] Boyko, E. J., Ahroni, J. H., Cohen, V., Nelson, K. M., & Heagerty, P. J. Prediction of Diabetic Foot Ulcer Occurrence Using Commonly Available Clinical Information the Seattle Diabetic Foot Study. *Diabetes care* 2006, 29(6), 1202-1207
- [20] Leese, G.P., et al. Impact of health-care accessibility and social deprivation on diabetes related foot disease. *Diabet. Med* 2012. 30, 484-490 (2013).
- [21] Leese, G.P., et al. Stratification of foot ulcer risk in patients with diabetes: a population-based study.

- Journal compilation a Blackwell Publishing Ltd Int J ClinPract 2006, 60, 5, 541–545
- [22] Parliani. Development of risk Assessment Tool for Diabetic Foot Ulcer Among Diabetes Mellitus Patients in Indonesia. Master thesis 2016
 - [23] Nather, A., et al. Epidemiology of diabetic foot problems and predictive factors for limb loss. Journal of Diabetes and its Complications 2008, 22(2), 77-82
 - [24] Monteiro, S.M, &Ribeiro, M.D. External validation and optimisation of a model for predicting foot ulcers in patients with diabetes. Diabetologia 2010 53:1525–1533.
 - [25] Monteiro, S.M., et al., Validation and comparison of currently available stratification systems for patients with diabetes by risk of foot ulcer development. European Journal of Endocrinology 2012, 167 401–407
 - [26] Monteiro, S.M, et al Risk stratification systems for diabetic foot ulcers: a systematic review. Diabetologia 2011. 54:1190–1199.
 - [27] Kishore, S., et al. Categories of foot at risk in patients of diabetes at a tertiary care center: Insights into need for foot care. Indian Journal of Endocrinology and Metabolism 2015, 405-410.
 - [28] Wu, S. C., et al. Foot ulcers in the diabetic patient, prevention and treatment. Vasc Health Risk Management 2007. 3(1): 65–76
 - [29] Whitehead, D. Is there any optimum range regarding no. of references one should include in a research paper? Retrieved from www.researchgate.com 2013.
 - [30] Polit, F.D. Nursing Research: Generating and Assessing Evidence for Nursing Practice. 8th Ed. Wolters Kluwer. Lippincott, Williams & Wilkins 2008. 3-4

Table 1. Diabetic foot assessment

| Components | Assessment |
|----------------------|---|
| History | Duration of DM: ask the patient how long she or he has had DM |
| | History of ulceration and history of amputation: ask the patient about previous ulcer and assess the skin for signs of previous ulcer such as scars, Ask the patient about previous amputation and assess the skin for total toes and shape of foot for abnormalities |
| Physical examination | Neurological: Normal sensory can be indicated if the patient can feel the touching and giving pain on the feet and abnormal sensory can be indicated if the patient can not feel the touching and giving the pain on the feet |
| | Vascular (PAD/ PVD examination): Palpation dorsalispedis and posterior tibial |
| | Dermatologic: Inspection formed callus and fissures |
| | Musculoskeletal: Inspection foot deformity such as hammer toe, claw toe, hallux valgus, hallux rigidus, pesplanus, charcot, and limited joint mobility |
| Footwear | Assess kinds of footwear that have been used |

Table 2. Diabetic risk category (Level of Evidence IV)

| Risk Categories | | Definition |
|-----------------|---------|---|
| Low risk | Group 0 | Absence of neuropathy or PVD |
| High risk | Group 1 | Presence of Neuropathy, Absence of PVD or foot deformity |
| | Group 2 | Presence diabetic neuropathy and foot deformity, PVD, or diabetic |
| | Group 3 | Presence of Neuropathy + deformity History of DFU amputation |

Table 3. Diabetic foot care intervention

| Risk Categories | Diabetic foot care intervention |
|------------------------|--|
| Low risk (Group 0) | <ul style="list-style-type: none"> - Education Diabetic foot care <ol style="list-style-type: none"> 1. Daily feet inspection (injury, pain, color change, swelling, redness, breaks in the skin, etc.) including areas between the toes. 2. Regular washing of feet with careful drying, especially between the toes. 3. Advice on buying shoes: Shoes interior must be 1–2 cm longer than the foot. Low heels (<5 cm). Fasten shoes with lace to hold foot back in shoe, wearing socks reduces friction toes. 4. Demonstration of proper pedicure |
| High risk (Group 1) | <ul style="list-style-type: none"> - Education Diabetic foot care (Except no. 4) - Nurse demonstrate regular foot care and ask the patients to do demonstrate <ol style="list-style-type: none"> 1. Washing feet, cutting nails, removing callus 2. Use of creams for dry skin, tinea pedis and onychomycosis |
| Group 2 | <ul style="list-style-type: none"> - Education Diabetic foot care (Except no. 4) - Nurse demonstrate regular foot care and ask the patients to do demonstrate <ol style="list-style-type: none"> 1. Washing feet, cutting nails, removing callus 2. Use of creams for dry skin, tinea pedis and onychomycosis - Vascular consultation as needed: a cold, pink, painful foot is an indication of severe ischaemia and requires urgent vascular intervention |
| Group 3 | <ul style="list-style-type: none"> - Education Diabetic foot care (Except no. 4) - Nurse demonstrate regular foot care and ask the patients to do demonstrate <ol style="list-style-type: none"> 1. Washing feet, cutting nails, removing callus 2. Use of creams for dry skin, tinea pedis and onychomycosis - Dermatology consultation as needed: When traumatic wounds progress to foot ulcer, requires urgent dermatology intervention and patient education on need for rest, regular dressings, early reporting of problems. |

Personal Hygiene of Adolescents Who Play Video Game

Khoirotun Nisak, Romdzati

School of Nursing, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia

E-mail: nisaknessa@gmail.com ; romdzati@gmail.com ; romdzati@umy.ac.id

ABSTRACT

Background: Nowadays, video game playing becomes popular activities for all ages include adolescents. It can be played easily using gadgets or computers. Some video gamers exhibit pathological pattern such as symptoms of damage to family, social, school, psychological functioning, and also their health. Personal hygiene is also one of the problems that often occur among them. Some of adolescents forget their personal hygiene while playing video game.

Method: This study was realized with a sample of students who studied in junior high school. Research was conducted with 120 respondents. This study was conducted to reveal the personal hygiene of video game players. This used descriptive quantitative research with a cross sectional approach.

Result: Results of this study indicated that personal hygiene of 77 respondents (67.17%) was in moderate categories.

Conclusion: Most of adolescents who play video game were in moderate categories of personal hygiene.

Keywords: Personal Hygiene, Video Game, Adolescent.

I. INTRODUCTION

Nowadays, many adolescents are familiar to use handphone, gadget, and other electronic tools. They use it for communicating, browsing, and playing video game. In term of playing video game, there are many interesting and variative games. This becomes the reason why children and adolescents prefer to play video game to traditional game [1].

Based on data from Environment Software Association (ESA), about 36% of video gamer aged <18 year old [2]. They can play both of online and offline game. Video game provides various of game such as action, sports, strategy, role-playing, not to mention social games.

Recently, many study showed that video game can give negative impacts to people who play it. A study in America found that 8,5% of 8-18 years old gamer are addicted to video game [3]. Moreover, students who spent alot of time for playing video game experience difficult in focusing school course, have several health problems, and hardship in controlling the urge to play video game. Other negative impacts of playing video game are addicted and aggressive behavior [4]. Somebody will play video game again and again so it is hard to stop. Adolescents who play video game become lazy to take a bath and keep their hygiene [5]. This will result in some health problems.

II. METHODOLOGY

This research used quantitative descriptive method with a cross sectional approach. It was conducted to find out personal hygiene picture of adolescents who play video game. The samples were 120 students of first and

second class of Muhammadiyah Junior High School, they love to play video games. The research was conducted in April-May. Instruments used include demographic data such as name, gender, class and age; Problem Video Game Playing (PVP) questionnaire; and personal hygiene questionnaire [6]. Personal hygiene questionnaire consists of 20 questions.

III. FINDING AND DISCUSSION

The result of respondent characteristic in this research is used to know description based on gender, age, frequency of playing video game, duration of playing video game. Characteristic of gender and age of respondent is presented in table 1 as follows:

Table 1. Frequency Distribution Characteristics of Demographic Data of Students (N = 120)

| Characteristic of respondent | Frequency(n) | Percentage (%) |
|------------------------------|--------------|----------------|
| 1. Gender | | |
| Male | 69 | 57,5 |
| Female | 51 | 42,5 |
| 2. Age | | |
| 12 year old | 10 | 8,4 |
| 13 year old | 58 | 48,3 |
| 14 year old | 45 | 37,5 |
| 15 year old | 7 | 5,8 |

From the data that have been presented, male adolescents have bigger percentage than females, it was 69 students (57.5%). Meanwhile, almost half of respondents were 13 year old (48.3%). According to the Environment Software Association (ESA) [2], the

percentage of gender-related video game usage comprises 55% of men and 45% of women. This finding was similar with the results that have been done at Yale University School of Medicine that there were 76.3% of the majority of adolescent boys have a habit of playing video games [7]. The results of data that has been obtained for personal hygiene of video game player in adolescent presented in table 2 as follows:

Table 2. Distribution Frequency Personal Hygiene in Adolescents (N=120).

| Personal Hygiene | Frequency | Percentage(%) |
|-------------------------|------------------|----------------------|
| Good | 42 | 35 |
| Enough | 77 | 64,2 |
| Less | 1 | 0,8 |
| Total | 120 | 100 |

The following is the data on aspects of personal hygiene:

Table 3. Aspects of Personal Hygiene (N = 120).

| Aspect of Personal Hygiene | Frequency | Percentage (%) |
|--|------------------|-----------------------|
| 1. Aspect of Hand Hygiene | | |
| Good | 67 | 55,8 |
| Enough | 50 | 41,7 |
| Less | 3 | 2,5 |
| 2. Aspect of Hair Hygiene | | |
| Good | 71 | 59,2 |
| Enough | 48 | 40,0 |
| Less | 1 | 0,8 |
| 3. Aspect of Oral Hygiene | | |
| Good | 41 | 34,2 |
| Enough | 71 | 59,2 |
| Less | 8 | 6,7 |
| 4. Aspect of Skin Hygiene | | |
| Good | 30 | 25 |
| Enough | 66 | 55 |
| Less | 24 | 20 |
| 5. Aspect of Nail Hygiene | | |
| Good | 20 | 16,7 |
| Enough | 51 | 42,5 |
| Less | 49 | 40,8 |
| 6. Aspect of Eye Hygiene | | |
| Good | 33 | 27,5 |
| Enough | 83 | 69,2 |
| Less | 4 | 3,3 |
| 7. Aspect of Ear and Nose Hygiene | | |
| Good | 28 | 22,3 |
| Enough | 53 | 44,2 |
| Less | 39 | 32,5 |

Many factors affect personal hygiene level. The previous research [6] showed that the most influencing factors of personal hygiene care compliance are age and gender. Another research [8] showed that personal hygiene of female students is better than male students because usually female are more concerned with their hygiene.

Here is a discussion of each aspect of personal hygiene. First aspect is hand hygiene. Based on data from UNICEF a child in the youth category has begun diligently hand-washing every before and after meals. The second is hair hygiene. Hair hygiene still has to be improved again because some students answered just washing hair without using shampoo. Hair that is not treated properly will cause sweat and dust that can become dandruff. So, washing hair regularly with shampoo is needed at least twice a week. Hair problems include flea, dandruff, bald (alopecia) and hair inflammation [9]. The third aspect is oral hygiene. Adolescents still need improve the oral hygiene. Brush the teeth is including the activity of maintaining cleanliness or health. At least brush the teeth in the morning and at night before bed. It is better if brush the teeth after meal. It is also recommended to check to the dentist routinely before sick. Forth aspect is skin hygiene. Skin hygiene should be improved so that it can reduce the incidence of skin diseases. Moreover for students who have sensitive skin that is susceptible to disease, it is necessary to maintain the cleanliness of skin. Fifth aspect is nail hygiene. Nail hygiene is indispensable for health where nails that are not well maintained are a source of germs and microorganisms as an intermediary of transmission of gastrointestinal diseases. The sixth aspect is eye hygiene. Eyes become important organ. The seventh aspect is ear and nose hygiene. Adolescents are able to clean their ear and nose while bathing. WHO mentioned that most adolescents compliance in ear and nose hygiene is enough category [10].

IV. CONCLUSIONS

Based on this research, the conclusion is personal hygiene of adolescents who play video game is in enough category.

REFERENCES

- [1] Suangga, A., Ropi, H., and Mardhiyah, A. 2012. "Hubungan Aktivitas Bermain Video Game dengan School Myopia pada Siswa-Siswi SD Asy Syifa 1 Bandung." Jurnal. Sumedang: Fakultas Ilmu Keperawatan, Universitas Padjajaran.
- [2] Entertainment Software Association (ESA). 2015. More Than 150 Million Americans Play Video Games. Available at: <http://www.theesa.com/article/150-million-americans-play-video-games/> Accessed on 8 October 2014.
- [3] Gentile, D. 2009. Pathological video-game use among youth ages 8-18. Journal of the Association for Psychological Science, 1-9.
- [4] Tridhonanto. (2011). *Optimalkan Potensi Anak dengan Game*. Jakarta: Gramedia.
- [5] Cenzone, M. (2012). 10 Dangers of Video Gaming Addiction. Available in <http://www.symptomfind.com/health/video-game-addiction/> accessed on 29 October 2016.
- [6] Indrawati.(2014). Faktor-faktor yang berhubungan dengan *personal hygiene* pada anak sekolah dasar.
- [7] Cuda, A. (2010). *Study : Video Game Addiction in Teens Can Lead to Other Problems*". Accessed on 31 May 2015 from <http://www.ctpost.com/news/article/Study-Video-Game-addiction-in-teens-can-lead-to-814191.php>
- [8] Moktapalli, K., Indupalli, A.S., Sirwar, S.B., Jayaalakshmi, K.N., Bendigeri N.D., & Jamadar, D.C.(2013). *A study on health hygiene among school children in rural field practice area of ajims Mangalore in Karnataka: India*. India International Journal of Bioassays.
- [9] Hidayat, A.A.A. (2006). *Kebutuhan Dasar Manusia: Aplikasi Konsep dan Proses Keperawatan*. Jakarta: Salemba Medika.
- [10] World Health Organization (WHO). (2010). http://www.who.int/water_sanitation_health/hygiene

I-COSTRA: Innovation of Coconut Coir as Noise Barrier on Reducing Occupational Deafness Risk in Informal Industrial Sector

¹Mohamad MauluddinEka Putra, ²Yuli PuspitaDevi, ²Vievi Ruldi, ²Dini RahmaYanti, ²Meida Chairunnisa

¹Faculty of Vocational- Airlangga University, UNAIR – Surabaya, Indonesia

²Faculty of Public Health - Airlangga University, UNAIR – Surabaya, Indonesia

E-mail: mauluddineka@gmail.com

ABSTRACT

Development of informal industrial sector in Indonesia has increased the use of production machines with high risk of occupational deafness. Based on Permenaker number 13/2011 article 1, threshold value is standard of hazard in workplace that figured the content value or time weighted average which can be beared by worker and not causing any disease or health problem, by 8 hours of work time per day or 40 hours per day. But most of informal industrial sector in Indonesia still have not qualified the threshold value of noise, that condition may increase the occupational disease rate. The most significant way to handle the deafness as irreversible health problem is by prevention. Informal industrial sector known as a workplace with lack of occupational safety and health controlling by government. Experimental method is used to prove that noise can be reduced by coconut coir. As one of country with highest coconut production, Indonesia has still not used it optimally. Whereas, the use of coconut coir is friendly environmental and economical. The result shows I-COSTRA is an effective noise barrier with 16 dB and applicable for informal industrial sector.

Keywords : Noise barrier, Coconut coir, Occupational deafness

I. INTRODUCTION

Humans have been paying attention to the development of tools and machine to support a production process in an industrial company. In addition to providing a positive impact, those production equipment can have a negative impact as well. Noise is one of the negative impact that describe as an undesirable sound that comes from tools and production processes which in some degree may cause hearing loss (Indonesian Minister of Labor and Transportation, 2011). Hearing or hearing loss can occur if a worker is exposed to noise more than 8 hours a day or 40 hours a week with a noise intensity over than 85 dB. Occupational Deafness due to noise can cause persistent or irreversible cochlear nerve deafness (Rambe [1]). Due to its sedentary nature, the right step to avoid Occupational Deafness is by implementing OSH (Occupational Health and Safety) control in industrial company.

The industrial sector is divided into formal and informal sector. formal industry companies have clearly defined provisions including employment agreements and OHS control programs. Otherwise, the informal industrial companies have a certain working condition that complicate the implementation of OSH control. This situation resulted in a lack of worker health and safety concerns. One of the particular way to implementing OHS on informal sector is by applying the isolation of rice grinder with environmentally friendly noise barrier made from coconut coir which using an traditional based technical engineering.

Located on the equator with a tropical climate with wide marine geography already made Indonesia as a major producer of coconut commodities. Indonesia is the world's largest

coconut producer followed by Filipinos, India and Sri Lanka (Rukmana [2]). Although the production figures reached 1.2 tons per hectare but the figure is still far from the expectations of 2-4 tons per hectare. This is due to the lack of public knowledge about the processing of coconut parts other than fruit and most of the coconut that has passed its productivity period is left old and die.

One of the less utilized of coconut waste is the mesokarp part in the form of coarse coconut fibers called coconut coir as much as 35% of the coconut weight it self (Indonesian Research and Technology, 2004). The application of coconut coir as the basic material of noise barrier is expected to assist in minimizing the waste output. It also can serve as an alternative noise barrier that can reduce the occurrences of occupational deafness in a company or factory especially in informal sector of industry.

II. METHOD

Primary data obtained in the form of experimental results data that the authors did on November 12, 2015 at the Laboratory of Occupational Health, Faculty of Public Health, Airlangga University. In the experimental execution the author uses the tools and materials such as: wooden beam framework, cement paper, mosquito net, coco fiber, gypsum, glue eagle, water, pliers, nails, hammers, scissors, spades, and basins.

Secondary data obtained in the form of reliable data such as: books, journals, and the internet. All the data that has been collected, then carried out in-depth analysis so that can be obtained a scientific study that can be developed and is expected to be applied.

III. RESULT

A. Coconut Coir as Potential Noise Barrier

Although there are many types of noise barrier circulating in the market, but the price offered tends to be expensive, so it can not be applied by small and traditional factories. In addition to its less-flexible use of safety equipment as ear plugs, it make workers often refuse to wear them. Therefore we make I-COSTRA as an alternative material solution for noise barrier. Here are some of the potential possessed by the basic ingredients of this product, namely coconut coir.

- *Fibers in Coconut Coir*

A Fiber substance in coconut are theoretically able to absorb sound. The fiber serves to bend the sound so that when the sound hit the fiber surface on the coconut coir then some of the sound will be absorbed and a small part reflected.

- *Availability and Quality of Materials in Indonesia*

It has been explained previously that Indonesia is one of the largest coconut producing countries in the world. Production of this commodity is also spread almost in all regions with superior varieties with a top quality of fiber. Therefore, these materials have the potential to be exploited because the abundant materials, the purchase price of materials is very low, and the high cost accommodation or shipping is unnecessary because the material can be obtained almost anywhere in this country.

- *Reversible Material*

Due to the type of material that used is a reversible natural fiber (fiber) or renewable raw materials which have no negative environmental impact, so it can be produced as much as possible.

B. Design of I-COSTRA

A natural fiber is easily formed into many shapes such as wood and bamboo which can also be used as a soundproofing material, so that I-COSTRA have an ability to redesigned or adjusted to the various machines. However, a proper testing and calculating phase has to be done before making the design. I-COSTRA is using an ingredient such as coconut coir, gypsum, glue, and water, and using a tools as wire cutters, pliers, nails, hammers, shovels, and basins. I-COSTRA is made as effective as possible considering the shape, weight, cost, and ease of obtaining materials.

This is the example of I-COSTRA design in Rice Milling Unit (RMU) that used in the informal rice milling industry in Indonesia.

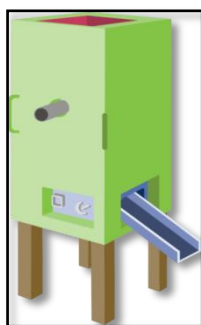


Figure 1. The example of I-COSTRA design in Rice Milling Unit (RMU)

C. The Effectiveness of Noise Reduction Using I-COSTRA

| Trial | Using COSTRA | I- Without COSTRA | I - Effectivity |
|-----------------|--------------|-------------------|-----------------|
| 1 st | 85 dB | 73 dB | 12 dB |
| 2 nd | 86 dB | 72 dB | 14 dB |
| 3 rd | 85 dB | 75 dB | 10 dB |
| 4 th | 87 dB | 72 dB | 15 dB |
| 5 th | 88 dB | 72 dB | 16 dB |

The experiments result shows that I-COSTRA has ability to decrease noise intensity about 10-16 dB. Therefore, I-COSTRA is considered quite competitive when compared with other soundproofing materials such as glasswool with 12-15 dB reduction.

IV. DISCUSSION

Here are some of the potential possessed by the basic ingredients of this product, namely coconut husk.

1. Fiber content in coconut husk.

Coconut husk is one type of material that has the potential to be silencers. Coconut fiber has fiber content so that it can absorb sound. The fiber serves to bend the sound so that when the sound of the fiber surface on the coconut husk then some of the sound will be absorbed and a small part reflected.

2. Availability of materials in Indonesia.

It has been explained previously that Indonesia is one of the largest coconut producing countries in the world. Production of this commodity is also spread almost in all regions with various types of superior varieties. Therefore, these materials have the potential to be exploited because with the availability of abundant materials, the purchase price of materials is also low, not necessary accommodation or shipping costs are high because the material can be obtained anywhere.

3. Top quality ingredients.

Indonesia has various kinds of superior coconut. It indicates good material and fiber quality so that I-COSTRA can produce maximum output.

4. Source of raw material is reversible material.

Due to the type of material that we use is a reversible natural fiber (fiber) or renewable raw materials then no negative environmental impact is generated so that production can be done as much as possible.

5. Coconut husk is waste

Coconut husk in Indonesia has not been optimally utilized. It was mentioned earlier that coconut husk is mostly only used as fuel. It causes a lot of coconut husk that ends up in the landfill and becomes unused waste. It is expected that with this I-COSTRA production it will help the factory as well as the coconut processing, especially the traditional factory to reduce the amount of waste company.

6. Increase company profit.

The reuse of waste production in the form of coconut husk directly affects the increase of company profit. In addition to converting non-valuable waste into a product that can be used as a silencer, the use of silencers will reduce occupational deafness so as to reduce the company's expenses for workers' medical expenses.

7. Coconut husk can be redesigned

The raw material in I-COSTRA is a type of natural fiber that is more easily formed when it is contained with other natural fibers such as wood and bamboo which can also be used as a soundproofing material, so that I-COSTRA can be more easily redesigned or adjusted to the existing machine in the rice processing plant.

ACKNOWLEDGEMENTS

The authors thank to God for everything that we have done. Thank to Our Parents for supporting us. Thanks to Our Lecture, Dani Nasirul Haqi, S.KM., M.KKK who helped the experiment. We also thank the Faculty of Public Health and Vocational Faculty, Airlangga University, and Surabaya Government for the Research Fund.

REFERENCES

- [1] Rambe, Andrina Yunita Murni. 2003. *Gangguan Pendengaran Akibat Bising* [online]. <http://Library.usu.id/download/fk/thtandrin>. Accessed on 5 October 2015 at 00.18
- [2] Rukmana, H. Rahmat. 2003. *Tegnologi Tepat Guna ;Olahan Sabut Kelapa* [online]. https://books.google.co.id/books?id=B9IPLvSHxGQC&pg=PA15&dq=sabut+kelapa&hl=id&sa=X&redir_esc=y#v=onepage&q=sabut%20kelapa&f=false. Accessed on 8 October 2015 at 13.01

***Dhikr* Therapy to Improving Sleep Quality for Post Surgery Patient at Banten Indonesia**

¹Nenden Atiyaningsih, S.Kep, ²Indah Wulandari, Ns.Sp.Kep.MB

¹Serang District Hospital - Banten Indonesia

²STIKes Faletahan Serang Banten - Banten Indonesia

E-mail: ¹nenden.atia@gmail.com, ²alkaddihan@gmail.com

ABSTRACT

Surgery is a medical procedure to treat disease using invasive method that can be painful and cause problems in the health sector, one of them is sleep quality disorder. Spiritual approach can be used to help a patient overcome sleep disorders due to post-surgery pain. *Dhikr* therapy can be used to improve sleep quality of patients forced operation. The aim of this study is to determine the effect of *dhikr* therapy in improving the sleep quality of patient postoperatively. This research is quantitative with quasi experimental research design with pre and post test without control group. The sampling technique in this study uses purposive sampling with 38 sample. The results of the univariate analysis show a decrease in mean score of sleep quality from 15.05 to 11.79. The results of statistical analysis using Wilcoxon test show P value 0.0001; it means that there is influence of *dhikr* therapy in improving the quality of sleep of patients postoperatively. This research can be used and developed as a complement to independent nursing interventions in nursing care after surgery.

Keywords: *Dhikr* therapy, Post-surgery, Sleep disorder, Sleep quality, Spiritual approach

I. INTRODUCTION

Resting and sleeping are a basic needs needed by everyone. Resting and sleeping can restore one's energy after performing daily activities - the day when the sleep function is required for physiological and psychological healing (DeLaune. S.C & Ladner, P.K. [1]). Sleeping has two stages. If it is not achieved, it will affect the quality of one's sleep. Poor sleep quality will be bad for health (DeLaune. S.C & Ladner, P.K. [1]). The impact of poor sleep quality are confusion, depression, mood changes, diabetes and cardiovascular diseases (Vaughans, B.W. [2]).

There are numbers of factor that interfere with one's sleep quality especially for post surgery patient (Nurlela, S., et al. [3]). After completion of the operation, usually a patient will feel pain in surgical wounds that result on patients who often awakened by the pain and it can cause sleep disorder (Potter, S. & Perry, H. [4]). Sleep disorder can be overcome by administering pharmacological and nonpharmacological therapy. One of nonpharmacological therapy is *dhikr* therapy that has been proven effective to improve the quality of sleep (Reflio, R., et al. [5]). Based on the working principle, *dhikr* therapy can stimulate the parasympathetic on central nervous system which has an effect opposite to the sympathetic nervous system and causes the balance in both the autonomic nerves. This is the basic principle of the onset of the relaxation response, which is the balance between the sympathetic nervous system and parasympathetic nerve (Al-halaj, Q.M. [6]).

Research on the spiritual is already widely found. But the specificity of this study is the intervention, *dhikr* therapy. The *dhikr* therapy is commonly used by the Moslem community as an act of remembering their God. But *dhikr* used as one of therapy especially to post-operative

sleep disorder is new. Therefore this study has its own uniqueness because it raised the cultural aspects of society in overcoming one of physiological phenomena postoperatively.

II. METHOD

This research is a quantitative research, using a quasi-experimental design with pre and post test without control group. The population in this study are all patients postoperatively on the second and third days and having sleeping disorder in Serang District Hospital with 38 samples using a purposive method. The sleep quality instrument in this study uses a questionnaire form of the Pittsburgh Sleep Quality Index (PSQI), which has been modified and tested the validity (Buysee [7]).

The study began by measuring sleep quality of patients using the modified PSQI, then the patients underwent *dhikr* therapy for two days with a frequency of five times a day after prayers. After the intervention, the second step is by remeasuring the quality of sleep by using modified PSQI. Analysis of data on this research are univariate and bivariate. Univariate analysis was conducted to see the average score of sleep quality before and after *dhikr* therapy. The higher score show the poor sleep quality of patients. Bivariate analysis using the Wilcoxon test shows for the presence of *dhikr* therapy effect on the quality of sleep.

III. RESULT

Table 1. Average sleep quality before and after *dhikr* therapy

| Sleep Quality | Mean | SD | Min-Max | P value |
|-----------------------------|-------|------|---------|---------|
| Before <i>dhikr</i> therapy | 15,05 | 2,04 | 12-19 | |
| After <i>dhikr</i> therapy | 11,79 | 2,81 | 7-16 | 0,0001 |

Table 1 shows that the average score of sleep quality score of patients before *dhikr* therapy is 15.05 (SD 2.04) with a highest score of sleep quality is 19 and lowest is 12. While the average score of patients after *dhikr* therapy is 11.79 (SD 2.81) with the highest sleep quality is 16 and lowest is 7. This means there is an increase sleep quality of post-surgery patients, because the smaller the score the better the sleep quality of the patient. Statistical test results also show the P value 0.0001 which can be interpreted that there is significant influence of *dhikr* therapy to sleep quality.

Having seen the chart 1 changes in patients' sleep quality score, it reflects a significant decreases in mean score of sleep quality. It shows an improvement of patients sleep quality postoperatively.

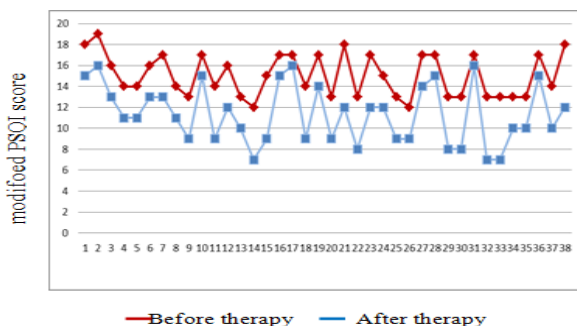


Chart 1. The sleep quality and *dhikr* therapy

IV. DISCUSSION

Based on these research results, the mean of sleep quality before being given *dhikr* therapy is 15.05, while the average score after therapy is 11.79 which indicates that there is a decrease of mean score of sleep quality before and after *dhikr* therapy. The lower score, the better one's sleep quality. The related research also shows the improvement of sleep quality of intervention group (surrender exercise) and finds there is a significant decline or improvement in the scores of components of sleep disorders ($p < 0.005$) in the intervention group between before and after surrender exercise which consists of breathing exercises and *dhikr* (Hanlon, J.T. [8]).

The decline of sleep quality score that occur in patients after minor surgery where pain is perceived at the surgical

wound is reduced by administering pharmacological therapy in the form of pain relieving drugs and nonpharmacological therapy. While the small decline of sleep quality score occurs to patients after major surgery with complicated pain should be fasted for 2-3 days, severe pain at the surgical site, and sepsis. The small decline of sleep quality scores also occurs to patients with age up to 50 years who have had the habit of frequently waking up and difficult to go back to sleep.

World Health Organization states that the patient experiencing pain often wakes up because of pain. Previous research has found sleep disorders such as insomnia occurs to elderly with complaints of an inability to return to sleep and woke at dawn (Adiyati [9]). The working principle of *dhikr* can shift the sympathetic nerve activity (Fight - or - Flight Response) into parasympathetic (Rest and Digest Response) that is more active to elicit a relaxation response (Hanlon, J.T. [8]). *Dhikr* is called as a greatness of God from muslim, by reading Tasbeih, Tahlil, and Tahmid. *Dhikr* focuses the mind with sacred words that will affect the body to become relaxed (Al-halaj, Q.M. [6]). Relaxation is one of nursing interventions in the fulfillment of sleep for patients with sleep disorders which caused a physical disorder or psychology disorder (Potter, S. & Perry, H. [4]).

When patients do a *dhikr*, there is a thought process that focuses on the words of the holy Tasbeih, Tahlil and Tahmid. They stimulate impulse on peripheral sensory through the voices of patients with the holy word. The limbic system would lower the emotions of patients, when thinking about disease Bulbar Synchronizing Region (BSR) impulse balances thought, so that patients are in a state of relaxation. The relaxation response can improve the work of the parasympathetic nervous system and decrease the sympathetic nerves work. The increasing of parasympathetic nerves work can improve peripheral blood flow, warm feeling, and the electrical resistance of the body. Beside, the production of alpha waves become slow, a decreasing oxygen consumption, carbon dioxide emissions, lowering lactic acid levels, lowering respiratory rate, lowering heart rate, lowering muscle tension, and lowering the blood pressure (Vaughans, B.W. [2]).

The parasympathetic nervous on the Central Nervous System (CNS) is a controller and maintain the quality of sleep. During the phase of sleeping, the parasympathetic nervous works and the sympathetic nerves get a rest. It causes a decreasing epinephrine and norepinephrine secreted by the adrenal medulla. Epinephrine and norepinephrine play a role in waking sleep soundly in Reticular Activating System (RAS). With the *dhikr* therapy, the parasympathetic nervous system works and RAS will retain control function of sleep. They will make patients easier to sleep and wake lower the frequency of waking up at night.

In this study, *dhikr* is done every time the patient finished performing the obligatory prayer 5 times a day, its call salat. The repetition of salat and *dhikr* indicates the perfect surrender of a servant to his Lord. Resignation of a

person because of his full belief in the creator will affect the work of the neural system. The results show that there is an active picture in the lobe of the brain after a person performs the routine of salat and zikr. The active areas include the anterior cingulate, dorsal medial cortex, caudate, insula, thalamus, and globus pallidus (Newberg, A.B. et al. [10]).

Cingulate cortex is a region that is located towards the front of the corpus callosum, in the medial frontal lobe. This region is involved in decision making and emotional regulation as well as vital to the regulation of physiological processes, such as blood pressure and heart rate (Mumenthaler, M. Mattle, H. and Taub, E. [11]).

The results of related studies have shown a significant influence of *al-dhikr* on the sleep quality of elderly with $P_{value}; 0.000$ ($p < 0.005$). The group of samples who used the *dhikr* therapy, obtained a better quality of sleep compared with control group (Reflio, R., et. al. [5]). Role of the *dhikr* for moslem was not only useful in cementing a servant relationship with the Creator, but also used as a self healing (Al-halaj, Q.M. [6]; Nurcahyo [12]). This therapy can be used as a complement of nursing intervention, for a human being can not be separated from its integrity as being physical, psychological, social, and spiritual (DeLaune. S.C & Ladner, P.K.[1]).

Rituals of worship such as prayer, *dhikr*, chanting the holy verses of the Qur'an are a routine activity carried out by a Moslem. This activities are often called worship. The goals is to bring a created closer to His creator and make a Moslem surrender to the His creator. During the process of execution of the worship, it appeared to cause increasing teh activity of some areas of the brain (Newberg, A.B. [10]; Kamal, N. F. Mahmood, N.H. and Zakaria, N.A. [13]). Praying like a *dhikr* after prayer requires the work of complex neurocognitive functions. No exact measuring tool has been found to determine the effect of *dhikr* on neurocognitive function. But several studies have shown changes in brain imaging and brain wave when a Moslem performs a *dhikr*.

A specific areas of the brain is involve when a Moslem performs a particular worship like *dhikr*. There are various processes in the brain associate with the practice of praying or *dhikr* with the brain network that supports created and His creator relationship psychologically. During routine worship such as salat there is a decrease in activation of the frontal region of the brain including the area of Pre Frontal Cortex (PFC) (Newberg, A.B. [10]). PFC is often classified as a multimodal association cortex. Multiple information, processed into an integrating sensory modalities in a precise way, forms the physiological construction of memory, perception, and varied cognitive processes. PFC participate in them in self-awareness, stimulus-bound behavior, decision-making, metacognitive processes, emotional processes, and regulation of self-behavior (Kamal, N. F. Mahmood, N.H. and Zakaria, N.A. [13]).

Regular prayers such as *dhikr* also decrease parietal lobe activation and decrease activation of the primary sensory areas in the visual cortex (Newberg, A.B. [10]). The

parietal lobe is the main somatosensory cortex that plays an important role in attention, spatial, and language (Mumenthaler, M. Mattle, H. and Taub, E. [11]). The primary visual cortex is part of the neocortex that receives visual input from the retina. Decreased activation of PFC, parietal lobe, and visual cortex during *dhikr* decreases temporary cognitive function so that rational thought processes decrease or there is a decrease in sensory awareness. This raises resignation to the Almighty which involves more psychological aspects.

Newberg's results also reveal an increase in cerebral blood flow seen in brain imaging before and after *zikir* (Newberg, A.B. [10]). Blood flow to the brain shows perfusion that goes into the cerebral. Cerebral perfusion is needed to deliver oxygen and nutrients to brain cells. Increased perfusion to the cerebral also increases the amount of oxygen and nutrients to the brain (Mumenthaler, M. Mattle, H. and Taub, E. [11]). *Dhikr* can be able to increase the perfusion to the cerebral so that the need for oxygen and nutrients to the brain adekuat.

In general, *dhikr* is categorizing as a form of meditation which is a self-giving activity to the creator. *Dhikr* for a Moslem helps one's not only physiologically but also psychologically. Physiologically, in addition to increasing cerebral perfusion and decreasing sensory awareness, it can also decrease metabolism, decrease heart rate, decrease breathing rate, and slow brain waves (Siddiqui, A.V. et al. [14]). Psychologically, the impact of spirituality on a person impacts on personal beliefs, individual coping, anxiety, or depression. Patients who submit to their Creator experience less psychological distress and have better expectations in healing and relaxation (Siddiqui, A.V. et al. [14]). Therefore the benefits of *zikr* are not only for one's physiological but also the psychological person.

V. CONCLUSION

Based on the analysis performed, the researchers suggest a developedment of independent nursing interventions such as therapeutic intervention of remembrance as a complement to the spiritual condition of the patient attention in improving the quality of patients' sleep. The role of nurse as a professional service providers, especially in meeting the spiritual needs of the patients, should be developed. They also should provide nursing interventions such as mentoring of *dhikr* therapy to post-operative patients who experience sleep disorders such as sleep latency, sleep quality, sleep duration, sleep efficiency, and daytime dysfunction, which are caused by internal and external factors. The researchers suggested do more research to determine the factors of lifestyle and character.

REFERENCE

- [1] DeLaune. S.C & Ladner, P.K.. Fundamentals Of Nursing Standards & Practice Second Edition. USA: Delmar. 2002.

- [2] Vaughans, B.W. Translation Prabawati,A. Basic Nursing. Yogyakarta: Raphe publishing. 2013.
- [3] Nurlela, S., et.al. Factors that influence sleep quality on laparatomy post-surgery patient at Muhammadiyah Hospital Gombong. Science health journal. Vol. 5 No. 1. 2009.
- [4] Potter, S. & Perry, H. Fundamentals of Nursing. Vol. 2. 4th Edition. St Louis : Elsevier. 2013.
- [5] Reflio, R., et. al. Influence of Al *Dhikr* to Elderly Sleep Quality. Studet Online Journal (SOJ) Vol. 2 No.2. Riau University.2015.
- [6] Al-halaj, Q.M.. The Effect of *Dhikr* Before Sleep with Elderly Sleep Quality at Tresna Wredha Budi Mulia Sosial Home Center of Jakarta. Journal nursing studies. <http://repository.uinjkt.ac.id>. 2014.
- [7] Buysee. (1998). The Pittsburgh Sleep Quality Index: A New Instrument For Psychiatric Practice And Research. Journal of psychiatric research.
- [8] Hanlon, J.T. Complementary And Alternative Medicine. USA: HillCompamies. 2009.
- [9] Adiyati. Influence of Aromatherapyfor insomnia on elderly at Bantul Yogyakarta, <http://journal.akbideub.ac.id/index.php/jkeb/article/view/79/78>. 2010
- [10] Newberg, A.B. Wintering, N.A. Yaden, D.B. Waldman, M.R.. Reddin, J. and Alavi, A. 2015. A case series study of the neurophysiological effects of altered states of mind during intense Islamic Prayer. Journal of Physiology – Paris. Elsevier. Available from: <http://dx.doi.org/10.1016/j.jphysparis.2015.08.001>
- [11] Mumenthaler, M. Mattle, H. and Taub, E. 2006. Fundamentals of neurology. Newyork: Thieme
- [12] Nurcahyo.The Effect of Resigned Exercise to Sleep Quality Improvement on Elderly with Depression. Psychology Faculty at Gadjah Mada University Yogyakarta. <http://etd.ugm.id/index.php?mod=penelitianDetail&sub=PenelitianDetail&act=view&typ=html&bookid=59548&obyekid=4>. 2013.
- [13] Kamal, N. F. Mahmood, N.H. Zakaria, N.A. Modeling brain activities during reading working memory task: comparison between reciting Quran and reading book. Procedia: Social and Behavioral Science. 2014.
- [14] Siddiqui,A.V. et al. 2008. Neuropsychology of prefrontal cortex. *Indian Journal of Psychiatry*. Jul-Sep 2008.
- [15] Jawaaid, H. Impact of religion/spirituality on health: what are the evidences?. Journal of Psychiatry, 2014.

Heavy Metal Phytoremediation Agents in Industrial Wastewater Treatment Using *Limnocharis flava* Callus

Nindya Pramesti Wardani, Andiena Elsafira, Galuh Primadani, Laili Choirul Umma

Pharmacy Education, Faculty of Pharmacy
Airlangga University, UNAIR, Surabaya, Indonesia
laili.choirul.umma-2015@ff.unair.ac.id

ABSTRACT

Industrial wastewater derived from automotive, medicine, textile, paint and paper industries are quite large in Asia and often contain heavy metals which are dangerous if the waste contaminates the water. Nowadays, wastewater treatment methods have weakness that is requiring high costs and large sludge volume. Thus, a better and more environmental-friendly method is a need. *Limnocharis flava* is an Indonesian plant that can easily grow in extreme environmental condition. However, *L. flava* is an effective phytoremediation agent to absorb Pb as 26.1%, Fe 63.99%, Mn 63.21%, and Cd 19.7% - 52%. The most functional part of *L. flava* as phytoremediation agent is root. However, callus can be made from any part of plant such as root, seed, and apical leaf. This research of wastewater treatment is based on literature study method consists of the primary filtration, sedimentation, and combination of phytoremediation process using callus of *Limnocharis flava*. At the end, water flows into the filtration pool which contains purification media (sand, charcoal, gravel, and sawdust) before it is discharged into the river. *L. flava* callus is multiplied by tissue culture using the MS agar medium. MS medium supplemented with 1 mg/L BAP (Synthetic Cytokinin) and 1 mg/L NAA (Auxin) as an optimum growth hormone combination and adjust at pH 5.8 (25 ± 1 °C). Plant tissue is prepared using 8 weeks old *L. flava* and there will be callus growth in three weeks. Wastewater will contact with *L. flava* callus in container pool for 3 days. Callus should be replaced with newly cultured callus in every 15 days because of absorbance limit of the callus. Research shows that 15 plants of *L. flava* which have direct contact with wastewater in 13 days can decrease heavy metal accumulation value.

Keywords: Callus, *Limnocharis flava*, Phytoremediation, Wastewater.

I. INTRODUCTION

Some industries can produce waste containing metals. Waste from the paint and mining industry containing lead metal (Pb); PVC industry and batteries producing waste containing cadmium (Cd); automotive, oil, textile and paper industries are iron (Fe) and Manganese (Mn). Containing metals in industrial wastewater often causes the contaminated water to be polluted. Heavy metals in water are in the form of colloidal, particulate and dissolved phases (Adepoju-Bello A.A, et al. [1]), it poses a danger to many lives, especially the lives of the surrounding people. Heavy metals can cause serious health effects symptoms vary depending on nature and measure of the ingested metal, heavy metals are toxic as they can react with carboxyl (-COOH), amines (-NH₂), and thiol (-SH) group forming complexes. Then biological molecules are modified so that it loses their ability (malfunction) more severely can cause cell death. When the metal forms complex, the enzyme system is deactivated because its protein structure has been affected, resulting disruption of the catalytic properties of the enzyme (Momodu MA and Anyakora CA [2]). For example, lead exposure produces commutative toxins and is likely to be carcinogenic at higher concentrations. Lead also causes autoimmune and irreversible damage to the brain (Momodu MA and Anyakora CA [2]). Manganese at low concentrations, can cause slowing of motor function, increase the tremor, decrease response rate, intellectual function, diadochokinesia, and mood lability. While at

higher concentration, Manganese can accelerate friction of the neuron, thereby increasing the risk of neurodegenerative abnormalities that can lead to Parkinsonism (Neurol J Can [3]). Cadmium can cause kidney damage and hypertension (Bakare-Odunola MT [4]). Iron is the required metal in oxidation process at cytochrome enzymes and respiratory pigments (hemoglobin), but these metals will become toxic if they are present in concentrations above normal and may lead to several diseases such as liver cancer (Hasbi, R. [5]) It is time to improve handling of industrial liquid waste containing heavy metals. Several methods often used in liquid waste treatment still have deficiencies, such as inactivated minerals (zeolites) if water turbidity is more than 10mg/L, ultrafiltration methods that need high costs and produce large sludge volumes, and also electrodialysis techniques that form metal-hydroxy compounds can cover filter membrane. Thus, a better and more environmental-friendly method is needed.

Phytoremediation techniques using *Limnocharis flava* is one technique that is expected can be applied in industrial wastewater containing heavy metals. Several studies have suggested that *L. flava* effectively decreases the heavy metal content of Pb, Fe, Mn, and Cd. To figure the effectiveness of *L. flava* as a phytoremediation agent, laboratory-scale research is done using callus from *L. flava* plant, because the callus is easier to grow so that the research is expected to progress faster. The ability of callus illustrates that whole

plants have greater potential, because its cells are more differentiated. If the results of the lab-scale experiment show optimal results, then field trials using adult plants can be performed. So that the use of plants *L. flava* as phytoremediation agent in wastewater containing heavy metals can continue to be developed and optimized.

Phytoremediation using *Limnocharis flava*

Phytoremediation technique can reduce waste especially heavy metal using plants, a complete phytoremediation reduces pollutants with the plant as media including trees, grasses, and aquatic plants. It can mean the destruction, inactivation or immobilization of pollutants into harmless forms (Chaney R.L., et al. [6]). Some plant conditions that can be used as phytoremediation agents are easy to grow in extreme places (environment containing many pollutants), able to remediate more than one pollutant, living in cosmopolitan habitat, easy to maintain, can produce high biomass, easy to harvest, and easily accumulates heavy metals (Abhilash PC, et al. [7]). Phytoremediation is safer than other technique since it is using plants as phytoremediation agents and not using chemicals. In addition, the cost used can be minimized especially if using wild plants that easily grow like *L. flava*. This plant effectively decreases heavy metal content with good absorption percentage, that is lead (Pb) of 26.1% (Haryati Maharani, Purnomo Tarzan, Kuntjoro Sunu [8]), Iron (Fe) equal to 20.32 - 63.99%, Manganese (Mn) equal to 20.45 % - 63.21% (Priyanti and Yunita Ety [9]) and cadmium (Cd) of 19.7% - 52% (Abhilash PC, et al. [7]). Phytoremediation using *L. flava* is one example of phytofiltration technique in the form of liquid metal waste absorption with the most effective plant part is the root.

II. METHOD

This study was conducted based on literature studies from relevant journals. The research is divided into laboratory and industrial scale. On the laboratory scale, *L. flava* callus absorption activity was performed on heavy metals (Pb, Mn, Cd, Fe) as an overview of the whole plant ability of *L. flava* which will be used as phytoremediator.

A. Laboratory Scale

• Tools and Materials

The tools used in this research consist of: autoclave, laminar air flow cabinet, AAS (Atomic Absorption Spectroscopy), pH meter, 100 mL volumetric flask, 100 mL Beaker glass, 100 mL measuring cylinder, and pipettes. Materials used in this lab scale are 8 weeks old *L. flava* plant in MS (Murashige and Skoog)

medium supplemented with 1 mg/ L BAP (Synthetic Cytokinin) and 1 mg/ L NAA (Auxin), simulated wastewater (Pb, Fe, Mn, and Cd 0.5mM), 70% (v/v) ethanol, and 0.4% (v/v) sodium hypochlorite.^[10] Constant variables are pH 5.8 (25±1°C) and callus weight. Dependent variables are the concentration of Pb, Fe, Mn, Cd in biomass.

B. Procedure

Media and equipment are sterilized first in the autoclave. Then, prepare the plant tissue in laminar air flow cabinet by cut its stem and node, cut the leaves from stem and reserve a small piece of petiole. Step two is plant surface disinfection in 70 % (v/v) ethanol for 30 s, followed by 0.4 % (v/v) sodium hypochlorite for 20 minutes. After that, rinse with sterile water three times for five minutes each. Then, cut the ends and cultivates apical leave into the culture media. There will be callus growth in three weeks. After that, add simulation wastewater and check the concentration of Pb, Fe, Mn, Cd in biomass using AAS.

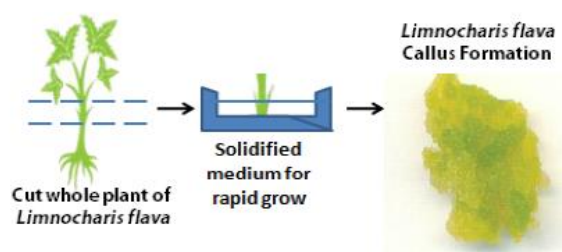


Figure 1. Method of Callus Culture

C. Industrial Scale

Design of Wastewater Treatment

Application

Wastewater treatment consists of several steps there are pre-treatment, primary treatment, and secondary treatment. Pre-treatment only performs screening of solid materials that come along with waste in the form of rough filtration process. Rough filtration process use bar screen with specification: length 10 mm, width 60 mm, space each of bar 75 mm, and flow rate 0.6 mm/s. Pool used in coarse filtration are made from steel with a capacity of 60 m³. As a primary treatment there will be sedimentation pool with specification: circular pool, hydraulic retention time 1.5 hours, over flow rate 25 m³/m days, depth of pool 2.5 m, diameter 12 m, base slope 7/100 mm/m, empty space 50 cm, and sludge scrapper rate 0.3 r/minute^[11]. Then, waste flows through a PVC pipe with diameter 5 cm and pore 25 mm to secondary processing that resulting non-pollute product such as heavy metals. We innovate phytoremediation combinations using *Limnocharis flava* callus replacing both the reserve osmosis and electrodialysis processes which are commonly used to extract heavy metals in industrial waste but are more

expensive. Waste that has been through the settling process will be channeled into a container pool (capacity 75L) and contacts 3 days with *Limnocharisflava* callus. In this pool, there will be a turbine aerator with 25- 30% oxygen transfer efficiency. After this process, water flowed through filter pipe to the filtration tank which contains purification media (sand, charcoal, gravel, and sawdust) and then it can be directly discharged into the river or public channel.

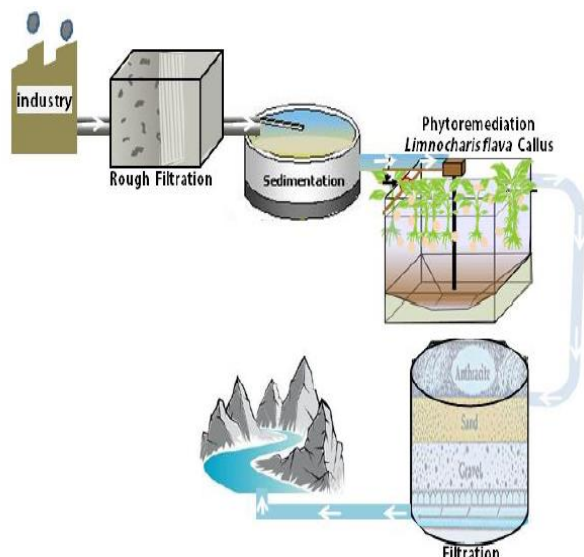


Figure 2. Design of industrial wastewater treatment

III. RESULT AND DISCUSSION

A. Laboratory Scale

Callus is an undifferentiated plant cell, made from part of the plant and grown on specific media such as MS agar. As it is made from a part of the plant, callus is considered to have the same characteristics as the mother plant. The purpose of using callus as an experimental object for heavy metal absorption is to know the effectiveness of metal absorption in the whole plant because callus can be grown while eliminating external factors so the real ability of the whole plant in heavy metals absorption can be determined. Callus' ability shows that there is higher potency in the whole plant because it has been perfectly differentiated into tissues like roots, stems, and leaves, and the most important part in heavy metal absorption is the root. Callus can reflect the whole plant's characteristics as proved by Gori et al. [12] that metal-tolerant callus can be grown into metal-tolerant plants.

Comparison of metal absorption between callus and the whole plant is shown by data from *Thlaspi caerulescens*

plant due to lacking data about *Limnocharis flava* Callus capability. This selection is based on the similarity of metals absorbed by the both plants (*Limnocharis flava* and *Thlaspi caerulescens*). *Thlaspi caerulescens* callus can accumulate 10,000 $\mu\text{g g}^{-1}$ Cd dry weight (DW). While the whole plant Cd absorbed as much as 14 mg Cd g⁻¹. This means that the ability of the whole plant is better 1.4 times than callus. Comparison of ability to absorb heavy metals between callus and whole plant proves plant ability as phytoremediator.

Tabel 1. Concentration of heavy metals absorbed in *Limnocharis flava*.

| Heavy Metals | Amount of heavy metal absorbed (mg/L) |
|--------------|---------------------------------------|
| Pb | 1.16 |
| Cd | 0.5 - 4 |
| Mn | 0.31 - 1.06 |
| Fe | 2.24 - 9.72 |

Source: Priyanti, 2013[9]

Limnocharis flava can be categorized as phytoremediator which has the ability to absorb heavy metals (hyperaccumulation) compared to the plants in general, proved from the table above. Hyperaccumulator plants with the capacity to take up excessive heavy metals (usually 0.1% to 3% of dry weight) are even more desirable [14]. Callus describes the basic capabilities of *Limnocharis flava* cells as they have totipotent characteristic.

B. Industrial Scale

This wastewater treatment consists of several processes, they are rough filtration, sedimentation, phytoremediation, and multiple layer filtration. The rough filtration process is used to separate waste water from solid metal particles and

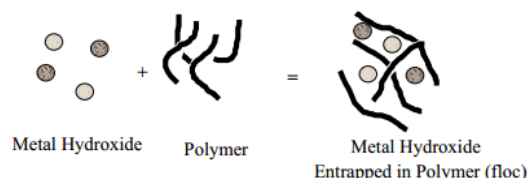


Figure 3. Attachment of Polymer to Metal Hydroxide

Source: Removing Heavy Metals from Wastewater. University of Maryland [12]

Beside of that, the compounds added is to adjust the pH which the callus grows optimally (pH 5.8). Once particles become enmeshed in the polymer, they are will be settled since they are heavier than water so that they can be removed from the wastewater.

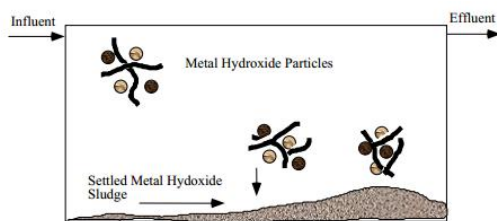


Figure 4. Settlement of Metal Hydroxide Complex
Source: Removing Heavy Metals from Wastewater. University of Maryland.[15]

This settling occurs in the sedimentation tanks which are designed to produce a calm flow for settling. The wastewater then will continue to secondary treatment. Most process in the secondary treatment is about phytoremediation using *L. flava*. Wastewater will contact with *L. flava* callus in container pool for 3 days.

The root system of *Limnocharis flava* is suitable as a phytoremediation agent because it has fibrous root type, dense, and long so it can be used as a wastewater phytoremediator. In the *L. flava* root, there are phytochelatin proteins that can bind to metal components. Heavy metals absorbed from the roots will then be translucent to other parts of the plant, such as stem and leaves through the xylem. Heavy metals can penetrate cells and participate in the process of cell metabolism. Therefore, plants form a detoxification mechanism by accumulating metals in vacuoles. In the root tissues, the metal will be stored in the cortex and assembled near the endodermis, whereas the endodermis itself will serve as a barrier to the removal of some of the metals. Therefore, heavy metal accumulation is mostly found in roots (Rijal, Muhammad, Mohamad Amin, Fathur Rochman, Endang Suarsini [13].

Every 13 days *L. flava* should be replaced with the new one because research shows that 15 *L. flava* which have direct contact with wastewater in 13 days can decrease heavy metal accumulation value as can decrease heavy metal accumulation value (Syukor ARA, Sulaiman S, Siddique MNI, Zularisam AW, Said MIM [16]). The last step, before water can be released to the environment it is routed to the multilayer filtration unit. The filtration unit is designed to trap particles that still exist in water. Water entering the filtration unit is passed through sand, charcoal, gravel, and sawdust with the same amount. Multilayer filtration is used as purifier media to capture the remaining metal hydroxide particle after this water treatment complete it can directly flow drainage.

REFERENCE

[1] Adepoju-Bello A.A, Ojomolade OO, Ayola GA Ayoola, et al. "Quantitative Analysis of Some Toxic Metals in Domestic Water Obtained from Lagos Metropolis". The Nig. J. Pharm, vol. 42(1), pp. 57-60, 2009.
[2] Momodu MA and Anyakora CA. "Heavy Metal Contamination of Ground Water: The Surulere Case

Study". Journal Environmental and Earth Sciences, vol. 2(1), pp. 39-43, Januari 2010.

[3] Neurol J Can. "Manganesee: the Controversial Metal. At What Levels Can Deleterious Effects Occur?". The Canadian Journal Of Neurological Sciences, vol. 23, pp. 93-94, 1996.
[4] Bakare-Odunola MT. "Determination of Some Metallic Impurities Present in Soft Drinks Marketed in Nigeria". The Nig. J. Pharm, vol. 4(1), pp. 51-54, 2007.
[5] Hasbi R. "Analisis Polutan Logam Tembaga (Cu) dan Timbal (Pb) dalam Sedimen Laut Pelabuhan Pantoloan berdasarkan Kedalamannya (Skripsi). Palu: UNTAD Press, 2007.
[6] Chaney RL, et al. "Potential Use of Metal Hyperaccumulators". Mining Environ Manag, vol. 3, pp. 9-11, 1995.
[7] Abhilash PC, PandeyVC, Srivastava Pankaj, et al. "Phytofiltration of Cadmium from Water by *Limnocharis flava* (L.) Buchenau Grown in Free-Floating Culture System". Journal of Hazardous Materials, vol. 170, pp. 791-797, 2009.
[8] Haryati Maharani, Purnomo Tarzan, Kuntjoro Sunu. "Kemampuan Tanaman Genjer (*Limnocharis Flava* (L.) Buch.) Menyerap Logam Berat Timbal (Pb) Limbah Cair Kertas pada Biomassa dan Waktu Pemaparan yang Berbeda". Lentera Bio, vol. 1 (3), pp. 131-138, September 2012.
[9] Priyanti dan Yunita Ety. "Uji Kemampuan Daya Serap Tumbuhan Genjer (*Limnocharis flava*) terhadap Logam Berat Besi (Fe) dan Manganese (Mn)," Lampung, Prosiding Semirata FMIPA Universitas Lampung, 2013.
[10] Kam, Melissa Yit Yee et.al. "The Biology and in Vitro Propagation of The Ornamental Aquatic Plant, *Aponogetonulvaceus*," Springer Plus, vol. 5, p. 1657, 2016.
[11] Kementerian Kesehatan RI. Direktorat Jenderal Bina Upaya Kesehatan dan Direktorat Bina Pelayanan Penunjang Medik Dan Sarana Kesehatan. "Pedoman Teknis Instalasi Pengolahan Air Limbah dengan Sistem Biofilter Anaerob Aerob pada Fasilitas Pelayanan Kesehatan". Seri Sanitasi Lingkungan, pp. 63-69, 2011.
[12] Gori Paola, Silvia Schiff, G. Santandrea and Andrea Bennici. "Response of *in Vitro* Cultures of *Nicotiana tabacum* L. to Copper Stress and Selection of Plants from Cu-Tolerant Callus". Plant Cell, Tissue and Organ Culture. Kluwer Academic Publishers. Printed in the Netherlands, vol. 53, pp. 161-169, 1998.
[13] Rijal, Muhammad, Mohamad Amin, Fathur Rochman, Endang Suarsini. "Response Growth and the Effectiveness of the Absorption of Heavy Metal B-Iii by *Limnocharis Flava* on a Scale Laboratory". International Journal of ChemTech Research. CODEN (USA): IJCRGG. Vol.9 (6), pp. 596-602, 2016.

- [14] Anning, Alexander K., Percy E. Korsah& Patrick Addo-Fordjour “Phytoremediation of Wastewater with *Limnocharis flava*, *Thalia geniculata* and *Typha latifolia* in Constructed Wetlands” International Journal of Phytoremediation. London: Taylor & Francis 15:5, 452-464. 2013
- [15] Ayres, David M., et al. “Removing Heavy Metals from Wastewater,” University of Maryland: Engineering Research Center Report. 1994
- [16] Syukor ARA, Sulaiman S, Siddique MNI, Zularisam AW, Said MIM, “Integration of Phytogreen for Heavy Metal Removal from Wastewater,” Journal of Cleaner Production vol. 112, pp. 3124-3131,2016.

Hypertension in Adult Age and Related Risk Factors

Nur Chayati, Hendra Gunawan

Nursing Department, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, *Yogyakarta, Indonesia*

E-mail address: n_cha_klt@yahoo.com

ABSTRACT

Background: Hypertension is one of the significant risk factors for further severe cardiovascular diseases. Furthermore, the incidence of hypertension in adult age population has increased gradually. Thus, assessment of hypertension incidence and their risk factors in adult age people has given the beneficence for treating and preventing program earlier.

Aim: To analyze hypertension incidence in adult age and their risk factors that dominantly effect the occurrence of hypertension.

Method: This study was correlational with survey method. Accidental sampling was conducted to 120 respondents who live around Malioboro district. Hypertension was detected from systole and diastole value, while the risk factors of hypertension were age, gender, family disease history, type of activity, the number of cigarette each day, the length of smoking, random blood glucose, and body mass index. Analyzing the data used Pearson correlation if data was normal, or used Spearman correlation if data was not normal.

Findings: From 120 participants, mean of systole pressure was 120,7 mmHg and mean of diastole pressure was 78,5 mmHg. Age mean was 39 years old, dominantly was woman amount 83 (69,2%), and without family disease history as 66 (55%). Mostly they had moderate physical activity amount 71 (59%). Mean of cigarette consumption was 11 pieces/ day, for 23 years. Random blood glucose mean was 131 mg/dl and mean of body mass index was 26 kg/m². Correlation analysis mentioned that body mass index had correlate with systolic and diastolic value significantly ($p < 0,05$).

Conclusion: Systole and diastole pressure value in adult age were still normal. Risk factor that correlate significantly with adult age blood pressure was body mass index. Another risk factors such as cholesterol level, blood glucose in fasting condition and two hour post meal, also food consumption were considered should be included in next study.

Key words: adult age, cardiovascular, hypertension, risk factors

I. INTRODUCTION

Cardiovascular disease is a disorder of heart and blood vessel function, this can occur due to heart deficiency or blood vessel constriction [1]. Heart disease is the leading cause of death and is predicted continue to increase. Around 80% of deaths from cardiovascular disease occur in low and middle income countries. If this incident is not addressed immediately, then by 2030 an estimated 23.6 million people will die from cardiovascular disease [2]. Risk factors for the emergence of cardiovascular disease include factors that can be modified and can not be modified. Factors that can not be modified such as age, sex (men more frequent than women, ethnicity (white ethnicity is more risk than other ethnicity), and family history of cardiovascular disease [3]. Whereas modifiable risk factors are high blood pressure, cholesterol level, obesity, tobacco use, lack of physical activity and diabetes mellitus [4].

To reduce the incidence of cardiovascular disease, prevention and treatment is required with multifactorial approaches and carried out continuously [5]. Health workers who have the role of implementing health services are required by the community to be able to cope with cardiovascular disease before they receive definitive treatment [6]. Nurses as one health worker have a promotive, preventive role in the community and curative

on clinical services to overcome cardiovascular disease [7]. Cardiovascular disease can be prevented by reducing the risk factors that can be modified through lifestyle changes, especially smoking behavior, unhealthy diet, physical inactivity, and alcohol use [3]. The risk of cardiovascular disease is common in adulthood, but most people are unaware that they have a risk of cardiovascular disease, so they do not take preventive measures to avoid cardiovascular disease. The aim of this study was to identify risk factors for cardiovascular disease in adulthood.

II. METHODOLOGY

This research is a quantitative descriptive research using survey approach. The sample used is 120 adults, using accidental sampling. The research location is in Sosromenduran RT. 8 RW. 14, Gedongtengen, Yogyakarta, Indonesia. This place was chosen because they have amount of adulthood, and facing the risk factors more often.

The inclusion criteria were a person aged 26-45 years, willing to be a respondent, can read and write, while the exclusion criteria were people with deaf and speech impairment. This research had single variable, risk factor of cardiovascular disease with sub variable in the form of risk factors include systole and diastole blood pressure value, smoking habit, diabetes mellitus, physical activity status, obesity, age, and family history. The tool used in this

research is sphygmomanometer, body scales, height measurement, and glucometer which have been tested calibration in meteorology unit, and glucometer tool has been done feasibility test at RS PKU Muhammadiyah Unit II.

Assessment of risk factor identification of cardiovascular disease was done sequentially by the researcher included measurement of body height and weight, asking history of family disease, physical activity, smoking habit, and then check blood pressure and random blood glucose. Prior to the measurement, researchers had asked respondents to remove their hats, jackets, shoes, socks or accessories used by respondents. The final stage of data

retrieval, the researcher looked back at the observation sheet that has been filled by the research assistant, if there is incomplete data the researcher asks back or do the measurement back to the respondent.

Data were analyzed by Pearson correlation test if data was normal, or used Spearman correlation if data was not normal.

III. RESULT

Table 1. Hipertension risk factors distribution (n = 120)

| Variable | | n | Percentage (%) |
|---------------------|---------------------------------|----|----------------|
| Gender | Man | 37 | 30,8 |
| | Woman | 83 | 69,2 |
| | No | 66 | 55 |
| | Hipertension | 14 | 11,67 |
| | Diabetes mellitus (DM) | 14 | 11,67 |
| History of diseases | Hearth disease | 4 | 3,33 |
| | Hipertension and DM | 13 | 10,83 |
| | Hipertension and hearth disease | 6 | 4 |
| | Herath disease and DM | 3 | 2,5 |
| Physical activity | Mild | 36 | 30,0 |
| | Moderate | 71 | 59,2 |
| | Severe | 13 | 10,8 |
| Smoking | Yes | 20 | 16,7 |
| | No | 10 | 83,3 |

Table 2. Hipertension risk factors distribution (n=120)

| Variable | | Mean | Min | Max | Std. Deviation |
|---------------------------|------------|-------------------------|------------------------|------------------------|----------------|
| Blood pressure | Sistole | 120,7 mmHg | 85 mmHg | 180 mmHg | 19,26097 |
| | Diastole | 78,5 mmHg | 40 mmHg | 110 mmHg | 13,00614 |
| Age | | 38.94 years old | 26 years old | 45 years old | 6.62 years old |
| Smoking | In one day | 10,5 pieces | 1 pieces | 24 pieces | 4,62592 |
| | Length | 22,8 years | 1 year | 31 years | 9,28412 |
| Random blood sugar | | 131,18 mg/dl | 60 mg/dl | 447 mg/dl | 61,80601 |
| Body Mass Index | | 25,99 kg/m ² | 15,2 kg/m ² | 45,2 kg/m ² | 5,30879 |

Table 3. Pearson correlation analysis between Body Mass Index and Diastole and Sistole Value

| BMI | n | r | P value |
|----------|-----|-------|---------|
| Sistole | 120 | 0,381 | 0,000 |
| Diastole | 120 | 0,363 | 0,000 |

IV. DISCUSSION

A. Blood Pressure

The mean systolic blood pressure was 120.7 mmHg, whereas the diastolic was 78.5 mmHg. The systolic lowest score was 85 mmHg, whereas in diastolic was 40 mmHg. The highest value of systolic was 180 mmHg and in diastolic was 110 mmHg. Hypertension can trigger the process of atherosclerosis. This is due to the high pressure of pushing Low Density Lipoprotein more easily into the intima. Hypertension causes increased vascular reactivity and triggers structural changes until hypertrophy occurs [11].

Hypertension occurs due to the interaction between hereditary factors and environmental factors. Factors that can cause a person to develop hypertension include age, sex, heredity, physical and occupational stress, excessive amounts of salt intake, excessive alcohol and coffee consumption, obesity, low physical activity [12].

B. Age

The average age of adult respondents was 39 years old, the youngest was 26 years old, while the oldest was 45 years. Most of the death from cardiovascular disease occur at 35-44 years old and more often with increasing age⁸.

Age was as a risk of cardiovascular disease. This is because age causes changes in the hearth and blood vessels. The effect of a lifestyle that lacks physical activity and smoking can accelerate heart damage. Blood pressure increases with the age of a person, as the arteries slowly lose their elasticity.

C. Gender

The prevalence of cardiovascular disease in men is similar to that of women, but women are better protected from cardiovascular disease before menopause. This is because women are protected by the estrogen that plays a role in increasing levels of High Density Lipoprotein (HDL). High HDL levels are a protective factor in preventing atherosclerosis or plaque buildup in blood vessel walls [10].

Men are at greater risk and earlier than women for cardiovascular disease Morbidity of cardiovascular disease in men is twice as large as women. Men can develop cardiovascular disease 10 years earlier than women. Endogenous estrogens are protective in women, but after menopause the incidence of cardiovascular disease in women increases rapidly, but not as great as the incidence of cardiovascular disease in men⁹.

D. Family History

Cardiovascular disease sometimes results from the manifestation of specific single gene abnormalities associated with the mechanism of atherosclerotic occurrence. If both parents of a person suffer from cardiovascular disease at a young age, then the child of the parent is at high risk for cardiovascular disease [9].

A family history of cardiovascular disease also heightens the risk of cardiovascular disease. Genetic factors are also influenced by environmental factors which then cause a person suffering from cardiovascular disease. Genetic factors also related to the metabolism of salt regulation and cell membrane renin [11].

E. Smoking

The average number of cigarettes smoked by respondents was 11 cigarettes / day, while the average length of smoking behavior was for 23 years. Smoking with large amounts of sticks and long periods of time can cause chemicals in cigarettes, such as nicotine and carbon monoxide damage the endothelial vessels of the arteries, increase blood pressure, and damage the cardiovascular system. Nicotine causes narrowing of blood pressure so that raises blood pressure and arterial blood vessels easily become torn due to narrowing. This resulting in increased platelet production causing the blood to froze easily, while carbon monoxide causes the loss of oxygen carried by the blood, moreover it caused an oxygen imbalance in the blood. Smoking also causes lower HDL levels in the blood [14].

F. Random Blood Sugar

High levels of GDS have a negative impact on body tissues in the form of atherosclerosis in various blood vessels [12]. A person with a high blood glucose value of more than 200 mg/dl is said to have DM disease¹⁵. DM causes lipoprotein disorders. This is the cause of major complications of DM in the form of atherosclerosis that appear earlier. The diabetic process of DM can damage the myocardium that causes cardiomyopathy. Hypertension and obesity tend to support and accelerate the process of atherosclerosis [11].

G. Body Mass Index (BMI)

Based on study, the average value of BMI on the respondents is 26 kg / m² or categorized as overweight. BMI more than normal are associated with increased cholesterol and trygliserida levels, lowering HDL levels and increasing LDL levels.

Increasing a person's BMI from normal will increase the risk of cardiovascular disease by 8%¹⁶. Obesity causes the heart to work bigger to pump blood throughout the body

and can cause an increase in blood pressure [12]. The risk of cardiovascular disease may increase if a person's body weight exceeds 20% of the ideal body weight.

H. Physical Activity

Based on research data, moderate physical activity is being done more by respondents the data is influenced by the work of the majority of Malioboro community that is as traders and housewives.

Active physical activity criteria are individuals who engage in moderate or severe physical activity or both, whereas the 'less active' criterion is an individual who does not engage in moderate or severe physical activity. Mild physical activity is a risky behavior against one of the occurrence of cardiovascular disease and even affect the life expectancy [1].

Good physical activity such as regular exercise can make changes to the cardiovascular system, like increased cardiac output and redistribution of blood flow from less active organs to the active organ and also decreases the risk of cardiovascular disease. Regular exercise also lowers systolic blood pressure, decreases circulating catecholamine, lowers cholesterol level and blood fats, increases HDL lipoprotein levels, improves coronary circulation and improves confidentiality [17].

V. CONCLUSION

The mean systolic blood pressure in the respondents was 120.7 mmHg, and the diastolic was 78.5 mmHg. It was still in normal range. The average age of adult respondents was 39 years old, majority were female, no family illness history, the number of smoked cigarettes was 11 cigarettes / day, and the average duration of smoking was 23 years. The mean random blood sugar was 131 mg / dl, they have moderate physical activity category, with an average BMI score was 26 kg/m². From the several risk factors that have been studied, only BMI values that have a significant relationship with the systole and diastole values.

ACKNOWLEDGMENT

Thank you to University of Muhammadiyah Yogyakarta which has provided simulant fund research aid.

REFERENCES

- [1] Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia. *Riset kesehatan dasar*. Jakarta. 2013.
- [2] Mendis, S., Puska P., Norrving, B. (Eds). *Global Atlas on Cardiovascular Disease Prevention and Control*. World Health Organization (in collaboration with the World Heart Federation and World Stroke Organization), Geneva. 2011.

- [3] Wantiyah. *Analisis faktor-faktor yang mempengaruhi efikasi diri pasien penyakit jantung koroner dalam konteks asuhan keperawatan di RSD. dr. Soebandi Jember*. Tesis, Universitas Indonesia, Depok. 2010.
- [4] World Heart Federation. *Cardiovaskuler disease*. Diakses tanggal 24 Desember 2014. <http://www.world-heart-federation.org/press/fact-sheets/cardiovascular-disease-risk-factors/>. 2012.
- [5] Lewis, Heitkemper, Dirksen, O'Brian, & Bucher. *Medical Surgical Nursing: Assesment and Management of Clinical Problem*. 2nd. USA: Mosby. 2007.
- [6] Faridah, V.N. Hubungan pengetahuan perawat dan peran perawat sebagai pelaksana dalam penanganan pasien gawat darurat dengan gangguan sistem kardiovaskuler. *Surya*, 2 (IV); pp 6–10. 2009.
- [7] Jaji. Peran keperawatan komunitas dalam peningkatan derajat kesehatan masyarakat menuju MDGs 2015. Universitas Sriwijaya, Indonesia. 2012.
- [8] Djohan, T.B.A. Penyakit Jantung Koroner Dan Hipertensi. Fakultas Kedokteran, Universitas Sumatera Utara, Sumatera Utara. 2004.
- [9] Andarmoyo, S., Nurhayati, T. Laki-laki dan riwayat keluarga dengan penyakit jantung koroner (PJK) beresiko terhadap kejadian PJK. Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Ponorogo, Ponorogo. 2013.
- [10] Anggraini, A.D., Waren, A., Situmorang, E., Asputra, H., Siahaan, S.S. Faktor-faktor yang berhubungan dengan kejadian hipertensi pada pasien yang berobat di poliklinik dewasa puskesmas Bangkinang periode Januari sampai Juni 2008. Karya Tulis Ilmiah Strata satu, Fakultas Kedokteran Universitas Riau, Riau. 2009.
- [11] Departemen Kesehatan Republik Indonesia. Pedoman pengendalian penyakit jantung dan pembuluh darah. Jakarta. 2007.
- [12] Nastiti, D. Gambaran faktor resiko kejadian stroke pada pasien stroke rawat inap di rumah sakit karakatau medika. Karya tulis ilmiah, Universitas Indonesia, Depok. 2011.
- [13] Mariyono, H.H., Santoso, A. Gagal jantung. *Journal Penyakit Dalam*, 8 (3); pp 85-94. 2007.
- [14] Stroke Association. Converging Risk Factors. 25 Januari 2015. www.strokeassociation.org. 2010.
- [15] Departemen Kesehatan Republik Indonesia. Profil Kesehatan Indonesia. Jakarta. 2008.
- [16] Mawi, M. Indeks massa tubuh sebagai determinan penyakit jantung koroner pada orang dewasa berusia di atas 35 tahun. *Journal Kedokteran Trisakti*, 23 (3); pp 87-92. 2005.
- [17] Supriyono, M. Faktor-faktor risiko yang berpengaruh terhadap kejadian penyakit jantung koroner pada kelompok usia < 45 tahun. Tesis program pasca sarjana, Universitas Diponegoro, Semarang. 2008.

A Systematic Review of Relationship between Green Tea Consumption and Improvement of Lipid Profile as Action Plan for Preventing Cardiovascular Disease (CVD) Development

¹Prima Alifian H, ²Fahmi Dimas Abdul Azis, ³Fairuza Syarfina, ⁴Safira Adilla, ⁵Aprillia Tanto

^{1,2,3,4,5} Faculty of Pharmacy, Airlangga University, Surabaya, Indonesia

E-mail address: primaalifianhergaputra@gmail.com

ABSTRACT

Tea (*Camellia sinensis*) is one of the most popular beverages in Asia. Tea divided into three categories based on degree of fermentations, one of them is green tea. Many researchers have reported antioxidant activity of green tea to prevent chronic diseases. Daily consumption of green tea can reduce the development of atherosclerotic complication related to stroke, myocardial infarction, coronary heart disease, and cardiovascular diseases (CVD). There are evidences from clinical studies that prove green tea can play protective role in the development of CVD. Various components of green tea, especially polyphenol, have antioxidant and antidyslipidemic activities. The aim of this study was to review the relationship between green tea consumption and CVD development. Published randomized controlled trial (RCT) and meta-analysis (2007-2017) were identified based on searches of on-line databases (Cochrane Library, PubMed, Science Direct). The search terms used included green tea and cardiovascular. From electronic searches database we found 3.642 articles, 6 research articles met inclusion criteria have been conducted and summarized. There were significant reduction of total cholesterol (TC) ($p < .05$) found in 3 articles, low-density lipoprotein cholesterol (LDL) found in 4 articles, triglyceride (TG) found in 3 articles, and significant increment of high-density lipoprotein (HDL) found in 2 articles. The articles also showed reduction of CVD risk including blood glucose concentration, blood pressure, inflammatory biomarker and anthropometrical measurements. Green tea consumption might be associated inversely with the development of CVD. The consumption of green tea extract indicates improvement of lipid profile and reduction of CVD risk. The utilization of dietary supplement, such as green tea and its polyphenol component, have promising potential to prevent the development of CVD complications.

Keywords: Green Tea, Cardiovascular Disease, Dietary, Prevention

Abbreviation :

| | |
|---------------|-----------------------------------|
| ApoA | : Apolipoprotein A |
| ApoB | : Apolipoprotein B |
| BMI | : Body mass index |
| CRP | : C-reactive protein |
| CVD | : Cardiovascular diseases |
| DBP | : Diastolic blood pressure |
| DNA | : Deoxyribonucleic acid |
| EC | : Epicatechin |
| EGC | : Epigallocatechin |
| EGCG | : Epigallocatechin-3-0-gallate |
| GTE | : Green tea extract |
| HC | : Hip circumference |
| HDL | : High-density lipoprotein |
| LDL | : Low-density lipoprotein |
| NO | : Nitrite oxide |
| ROS | : Reactive oxygen species |
| SBP | : Systolic blood pressure |
| SOD | : Super oxidized dismutase |
| TC | : Total cholesterol |
| TG | : Triglyceride |
| TNF- α | : Tumor necrosis factor- α |
| WC | : Waist circumference |

I. INTRODUCTION

Tea (*Camellia sinensis* L.; family Theaceae), is the most popular beverage and being widely cultivated in Asia especially in Southeast Asia^[24]. Tea is divided into 3 major types based on the processing methods which involved the fermentation process. Green tea is a type of tea that is not fermented and didn't go through the oxidation process. Fermentation process on the tea leaves may reduce the concentration of tea catechin. Green tea has the highest catechin content among other types of tea. Those catechin are epicatechin (EC), epigallocatechin (EGC) and epigallocatechin-3-0-gallate (EGCG) which is the largest component of green tea catechins^[4].

Consumption of green tea or its extract may provide protection against chronic diseases, including cardiovascular disease (CVD)^[7,25]. Tea catechin exert variety mechanism of actions that responsible for the health benefits of green tea such as antioxidant, anti-inflammatory, anti-hypertensive, anti-diabetic, anti-mutagenic, anti-bacterial and anti-viral effect^[25]. The cardioprotective effect of green tea and EGCG were shown in *in vivo* studies to reduce the development of

atherosclerosis and progression of evolving atherosclerotic lesion in hypercholesterolemic. Daily intake of green tea decreases the incidence of coronary heart disease, stroke, and myocardial infarction. Green tea has been shown to suppress the oxidation of low-density lipoprotein (LDL). It is well recognized that LDL is an important risk factor for the development of CVD. Supplemented green tea catechins in diet or drinking water was shown to reduce ApoB, improve the ratio of ApoA-1/ApoB that associated with higher risk of CVD, up-regulate LDL receptor binding activity and increase the level HDL of HDL-cholesterol *in vivo*^[25,21].

II. METHOD

We conducted electronic searches in the following databases: Cochrane Library, PubMed and Science Direct. Published randomized control trial (RCT) and meta-analysis of RCT (2007-2017), the search terms used included green tea and cardiovascular. Titles, abstracts, and methods were screened for relevance. The relevant articles were selected for further consideration (Fig. 1).

A. Search Term and Selection Criteria

The search term used include: “green tea” and “cardiovascular”. These were combined using the Boolean logic AND. Studies were eligible for inclusion: (1) RCTs and meta-analysis of RCTs studies that test the effectiveness of orally administered green tea, extract, or isolated polyphenol of green tea against placebo, (2) subject that involved in this study is healthy subject or those who have high risk CVD factors including overweight, obese, dyslipidemia, diabetes mellitus and hypertension, (3) reported lipid profile (TC, TG, LDL, HDL) and/ or SBP, DBP, pulse pressure, glucose metabolism indices or inflammatory biomarkers, related to metabolic syndrome or all mortality factor relate CVD as outcome measures, (4) none of the studies involved the subject that presented to be known with CVD incident, myocard infarction incident, taking lipid lowering agent, cardiovascular intervention including percutaneous coronary intervention or coronary artery bypass grafting, and restricted to smokers or alcohol consumers.

All article identified from electronic searches were screened independently by five investigators (P.A.H., F.D.A.Z., F. S., S.A., and A.H.T) based on criteria:

randomized controlled trial (RCT) or meta-analysis article of RCT, year published article 2007-2017 clinical study. We found 17 articles to be screened for the titles, abstracts and methods for relevance. If consensus was reached, irrelevant articles were excluded and relevant articles were moved to the next stage (full-text review). The articles assessed for eligibility by inclusion criteria outlined above. In total 17 articles, only six articles met the inclusion criteria and were included in this systematic review.

B. Data Extraction

Five reviewers (P.A.H., F.D.A.Z., F. S., S.A., and A.H.T) independently extract data using data extraction template. The template included the following: authors; subject; dose; duration; results; study design.

C. Outcome

The primary outcomes included in this systematic review on the effect of green tea consumption on preventing CVD were responses of several biomarkers associated with CVD risk factors, including lipid profile (TC, TG, LDL, HDL) and/ or SBP, DBP, pulse pressure response, glucose metabolism indices, such as fasting glucose, fasting insulin levels, and inflammatory biomarkers, including C-reactive protein (CRP) and Tumor Necrosis Factor- α (TNF- α), and anthropometrical measurements including BMI, WC, and HC.

D. Data Analysis

Six studies were assessed based on inclusion criteria. These studies were analyzed for their design, interventions, sample size, and the age and gender of the participants, and outcome. $P < .05$ and $P < .001$ was defined as being statistically significant in this study.

III. RESULTS

After literature search through 3 search engines, a total of 3642 were identified. Then 3625 articles were excluded by title screening. Abstracts of the remaining 17 articles were reviewed and 11 articles were retrieved in full text, where did not match inclusion criteria study design such as smokers, cardiovascular incident, lipid lowering agent patient, and relevant results were not reported. These articles were excluded after discussion between five independent investigators (Fig. 1).

As demonstrated in table 1, the studies included here were published between the years 2008 and 2015, with the numbers of subjects ranging from 46 to 111. Among of them, one study was conducted in Japan, two in

Poland, one in USA and two in Taiwan. In terms of study population, eligible subjects consisted of men and women, except for two studies that recruited only women^[3,11]. The subject of the studies that included to the review were three studies recruited obese subjects^[2,11,20], one trial recruited overweight subjects^[3], one trial recruited healthy subjects^[18] and one trial recruited older subjects^[17]. Six studies instructed the subject to maintain their physical activity and previous diet including polyphenol, catechin, or caffeine.

anthropometric outcome including BMI and waist circumference. A study conducted by Bogdanski *et al* (2012), reported that there were no significant in BMI and waist circumference after intervention within group and between group ($p>.05$). However, metabolic markers, CRP ($p<.001$), showed improvement within and between groups therefore reduce CVD and other metabolic syndrome risk^[2]. In the other hand, Suliburska *et al* (2012) found the significant reduction on BMI ($p=.03$) and waist circumference ($p=.04$) on GTE group compared to placebo group.

IV. DISCUSSIONS

Green tea consumption has been proven to reduce the risk of CVD in both people with the risk factors for CVD or healthy subjects. The substance that responsible for the efficacy produced by green tea is the catechins compound, mainly EGCG^[5]. Experimental and translational clinical studies have provided further insight into the mechanisms of benefit for green tea against CVD. Those mechanisms are such as anti-oxidant effects, anti-inflammatory effects, and improvement of endothelial functions^[5].

A. Anti-oxidant Effect

All catechin compounds in tea have various biological activities with various mechanisms related to their chemical structure. EGCG has an antioxidant activity that scavenging free radicals in the body^[8]. Free radicals formed from oxidant compounds in the body when the body experiencing oxidative stress or inflammation. In addition, free radicals also could be formed when the body's immune system responds to pathogenic bacteria. Free radicals can damage cells, DNA, fat, and protein. Research that conducted by Guo *et al* (1999) and Sutherland (2006) reported that EGCG can scavenge superoxide compounds and hydroxyl radicals comprising 1,1-diphenyl-3-Picrilhidrazil, ROS (Reactive Oxygen Species), radical peroxy, nitrite oxide (NO), radical Free carbon-center, oxygen singlet and free radical lipids, and peroxy nitrite with the nitration barrier of tyrosine.

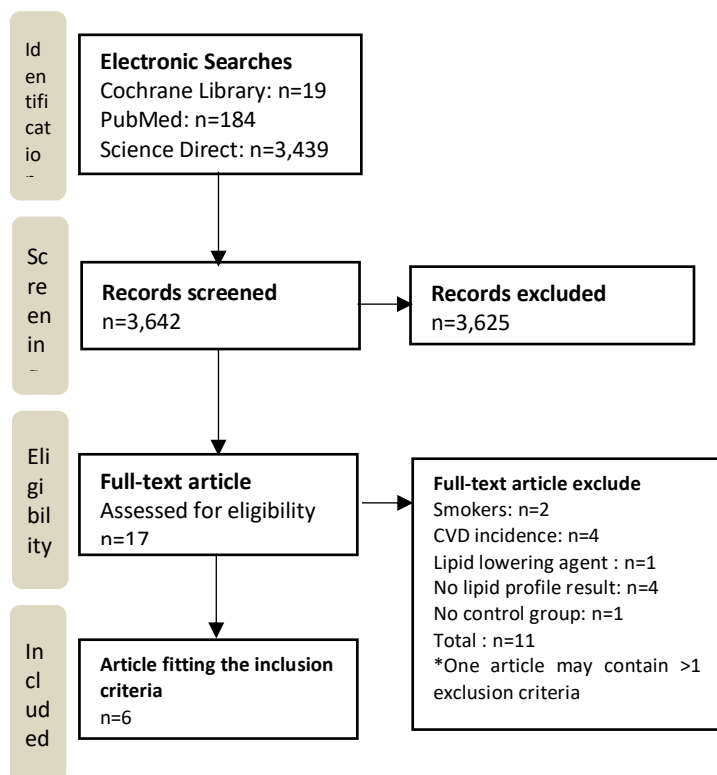


Figure 1. Schematic representation of the flow of information during the different phases of the systematic review

All studies that included in this systematic review showed statistically significant ($p<.05$) results in association between green tea intake and reducing total cholesterol and LDL cholesterol^[2,3,11,17,18,20], five studies showing reduction of triglycerides ^[2,3,11,17,20] and five studies showing protective role of green tea as HDL cholesterol enhancement^[2,3,11,17,20].

The metabolic syndrome markers reported in the 6 studies included systolic blood pressure^[2,3,11,18,20], diastolic blood pressure^[2,3,11,18,20], BMI^[2,3,11,18,20], WC^[2,3,11,17,20], HC^[3,11,17], and CRP^[2]. SBP, DBP, HC, and CRP showed no significant difference between baseline characteristic and placebo control groups in all studies. Two studies examined the effect of 379 mg/day GTE supplementation on

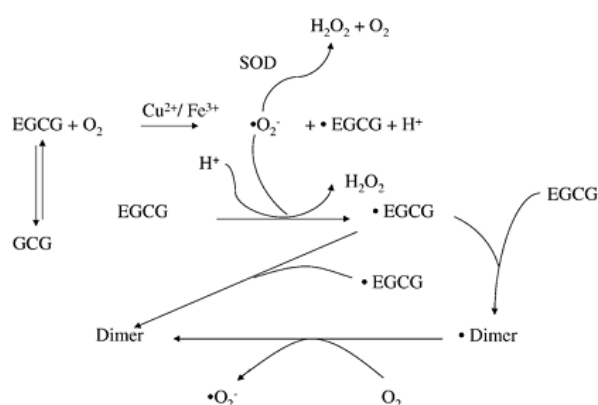


Figure 2. Autooxidation EGCG mechanism of action^[10]
Mechanism of action of EGCG as free radical scavenger is due to the one electron reduction potential. Antioxidant activity as hydrogen or electron donor is determined by this reduction potential of free radicals. Hou *et al* (2005) reported that EGCG was auto-oxidized under cell culture conditions. The reaction probably catalyzed by metal ions such as Cu^{2+} in the culture medium, produces superoxide radicals and EGCG radicals (EGCG). The superoxide radical can further

react with another EGCG molecule to produce H_2O_2 and EGCG. Two EGCG molecules may collide to form a dimer. It is more likely, however, for the EGCG to attack the hydroxyl group of another EGCG molecule, which is more abundant, to form a dimer radical (dimer). The dimer radical can react with molecular oxygen to form the EGCG dimer and regenerate the superoxide radical. An alternative mechanism is that the EGCG is oxidized by molecular oxygen to form O_2 and EGCG quinone, and the quinone will react with another molecule of EGCG to form the dimer. In either case, the reaction is propagated by the reaction of superoxide with EGCG, generating EGCG dimers and H_2O_2 . Dimers can be further transformed to other compound, presumably polymer, in a similar manner of oxidation. The addition of Super Oxidized Dismutase (SOD) facilitates the conversion of O_2 to H_2O_2 and inhibits the propagation of the chain reactions. Therefore, the auto-oxidation of EGCG is inhibited. More researches is needed to substantiate these mechanisms^[10].

Table 1. Characteristics of enrolled clinical trials and study design

| Authors | Subjects | Dose | Duration | Results | Study Design |
|----------------------------------|---|---------------------------------|-----------|---|---|
| Bogdanski <i>et al.</i> , 2012 | Obese adults; $n = 56$; 20-60 years | 379 mg GTE(208 mg of EGCG)/ day | 3 month | ↓TC, LDL, TG, ↑HDL (significant different between groups) | Randomized double-blind, placebo-controlled trial |
| Suliburska <i>et al.</i> , 2012 | Obese adults; $n = 46$; 30-60 years | 379 mg GTE(208 mg of EGCG)/ day | 3 month | ↓TC, LDL, TG (significant different between groups) ↑HDL (no significant different between groups) | Randomized, double-blind, placebo-controlled |
| Miyazaki R. <i>et al.</i> , 2013 | Older adults; $n = 52$ | 630,9 GTC/ day | 14 months | ↓TC, LDL (significant different within group) ↓TG, ↑HDL (no significant different within group) | A randomized controlled trial using a double-blind, placebo-controlled design |
| Nantz, Meri P., 2008 | Healthy adults; $n = 111$; 21-70 years | 200 mg GTC/ daily | 3 weeks | ↓TC, LDL (significant different within group) | A randomized, double-blind, placebo-controlled parallel study. |
| Hsu <i>et al.</i> , 2008 | Obese subjects; $n = 100$; 16-60 years | 400mg GTE/ daily | 12 weeks | ↓LDL, TG, ↑HDL (significant different between group) | A randomized, double-blind, placebo-controlled clinical trial. |
| Chen <i>et al.</i> , 2015 | Overweight adults; $n = 92$; 20-60 years | 500mg GTE(285,6 mg EGCG)/ daily | 12 weeks | ↓TC, LDL (significant different between group) ↓TG, ↑HDL (no significant different between group) | A randomized, double-blind, placebo-controlled clinical trial |

Abbreviation: HDL=High-density lipoprotein; LDL= Low-density lipoprotein; TC= Total cholesterol; TG= Triglyceride

B. Anti-inflammation Effect

Inflammation is one of the processes that involved in the earliest stage of atherogenesis to later stage of plaque formation and rupture which causes clinical events such as myocardial infarction and stroke[13]. *In vitro* studies have proven the effects of green tea catechin towards inflammatory cells. Leukocyte has the important role in the inflammation process, it migrates from the intravascular space into the tissues to attack micro-organisms and EGCG have found to be a potent inhibitor of leukocyte migration through endothelial cell monolayer^[9]. Besides leukocyte neutrophils also play an essential role in host defense and inflammation. EGCG has strong effects in inhibiting the neutrophil elastase. Both oral EGCG and GTE block neutrophil-mediated angiogenesis *in vivo* in an inflammatory angiogenesis model[6]. Green tea catechins have been shown in inhibiting the cytokine-induced adhesion molecule expression and monocyte adhesion in cultured endothelial cells^[16].

C. Improvement of Endothelial Function

The endothelium is a major regulator of vascular homeostasis and controls arterial tone, thrombosis, the composition of the arterial wall, and local inflammation by production of a variety of factors, including nitric oxide nitric oxide[23]. Recent studies indicate that green tea extracts and individual GTC, including EGCG stimulate phosphorylation of endothelial nitric oxide synthase (eNOS) at serine 1177, a response that increases production of nitric oxide[1,14,15]. In *in vitro* studies, Caveolin-1 (Cav-1), a negative regulator of eNOS, was down regulated by green tea polyphenols[17]. Experimental studies provide strong evidence that green tea acts via specific signaling pathways in endothelial cells that are relevant to the pathogenesis of atherosclerosis. It shows the strong links between endothelial dysfunction and the pathogenesis of atherosclerosis. Therefore, this mechanism might account for reducing the cardiovascular risk among individuals with higher green tea consumptions^[5].

Several limitations of studies such as uncontrolled diet and physical activity, time consumption of green tea, inadequate of sample-size and short-terms study may cause bias of the study and clinical effect association. However, none of the studies were sponsored by pharmaceutical companies and were not indicated any conflict of interest. Further meta-analysis assessing the summary effects of green tea was precluded because of study heterogeneity caused by the dosage and duration of green tea consumption, varied

condition outcomes, different P-value that defined as statistically significant outcomes and so on.

V. CONCLUSION

The consumption of green tea extract improved lipid profile such as LDL, TC, TG, and HDL and therefore potentially reduce CVD development.

REFERENCES

- [1] Anter, E., Thomas, S.R., Schulz, E., Shapira, O.M., Vita, J.A., Keaney, Jr J.F. 2004. Activation of eNOS by the p38 MAP kinase in response to black tea polyphenols. *J Biol Chem*;45: pp. 46637–43.
- [2] Bogdanski, P., Suliburska, J., Szulinska, M., Stepień, M., Pupek-Musialik, D. and Jablecka, A. 2012. Green tea extract reduces blood pressure, inflammatory biomarkers, and oxidative stress and improves parameters associated with insulin resistance in obese, hypertensive patients. *Nutrition Research*, 32(6), pp.421-427.
- [3] Chen, I., Liu, C., Chiu, J. and Hsu, C. 2016. Therapeutic effect of high-dose green tea extract on weight reduction: A randomized, double-blind, placebo-controlled clinical trial. *Clinical Nutrition*, 35(3), pp.592-599.
- [4] Chou Cheng-Chun, Lin Lon-Leu, Chung Kinng-Thom, 1999. Antimicrobial Activity of Tea as Affected by The Degree of Fermentation and Manufacturing Season. *International Journal of Food Microbiology*: pp. 127.
- [5] Deka, A. and Vita, J.A., 2011. Tea and cardiovascular disease. *Pharmacological research*, 64(2), pp.136-145.
- [6] Donà, M., Dell'Aica, I., Calabrese, F., Benelli, R., Morini, M., Albini, A. and Garbisa, S., 2003. Neutrophil restraint by green tea: inhibition of inflammation, associated angiogenesis, and pulmonary fibrosis. *The Journal of Immunology*, 170(8), pp.4335-4341.
- [7] Forester S. C., Lambert J. D., 2012. Antioxidant Effects of Green Tea. *Mol Nutr Food Res*: pp. 1.
- [8] Guo, Q. et al., 1996. Studies on protective mechanisms of four components of green tea polyphenols against lipid peroxidation in synaptosomes. *Biochimica et Biophysica Acta - Lipids and Lipid Metabolism*, 1304(3), pp.210–222.
- [9] Hofbauer, R., Frass, M., Gmeiner, B., Handler, S., Speiser, W. and Kapiotis, S., 1999. The green tea extract epigallocatechin gallate is able to reduce neutrophil transmigration through monolayers of

- endothelial cells. *Wiener Klinische Wochenschrift*, 111(7), pp.278-282.
- [10] Hou, Z., Sang, S., You, H., Lee, M. J., Hong, J., Chin, K. V., & Yang, C. S. 2005. Mechanism of action of (-)-epigallocatechin-3-gallate: Auto-oxidation dependent inactivation of epidermal growth factor receptor and direct effects on growth inhibition in human esophageal cancer KYSE 150 cells. *Cancer Research*, 65(17), pp.8049–8056.
- [11] Hsu, C., Tsai, T., Kao, Y., Hwang, K., Tseng, T. and Chou, P. 2008. Effect of green tea extract on obese women: A randomized, double-blind, placebo-controlled clinical trial. *Clinical Nutrition*, 27(3), pp.363-370.
- [12] Li, Y., Ying, C., Zuo, X., Yi, H., Yi, W., Meng, Y., Ikeda, K., Ye, X., Yamori, Y. and Sun, X., 2009. Green tea polyphenols down-regulate caveolin-1 expression via ERK1/2 and p38MAPK in endothelial cells. *The Journal of nutritional biochemistry*, 20(12), pp.1021-1027.
- [13] Libby P. 2002. Atherosclerosis: the new view. *Sci Am*;286:46–55.
- [14] Lorenz M, Wessler S, Follmann E, Michaelis W, Dusterhoft T, Baumann G, et al. 2004. A constituent of green tea, epigallocatechin-3-gallate, activates endothelial nitric oxide synthase by a phosphatidylinositol-3-OH-kinase-, cAMP-dependent protein kinase-, and Akt-dependent pathway and leads to endothelial-dependent vasorelaxation. *J Biol Chem*; 279: pp6190.
- [15] Kim JA, Formoso G, Li Y, Potenza MA, Marasciulo FL, Montagnani M, et al. 2007. Epigallocatechin gallate, a green tea polyphenol, mediates NO-dependent vasodilation using signaling pathways in vascular endothelium requiring reactive oxygen species and Fyn. *J Biol Chem*;13736–45. pp 282
- [16] Ludwig, A., Lorenz, M., Grimbo, N., Steinle, F., Meiners, S., Bartsch, C., Stangl, K., Baumann, G. and Stangl, V., 2004. The tea flavonoid epigallocatechin-3-gallate reduces cytokine-induced VCAM-1 expression and monocyte adhesion to endothelial cells. *Biochemical and biophysical research communications*, 316(3), pp.659-665.
- [17] Miyazaki, R., Kotani, K., Ayabe, M., Tsuzaki, K., Shimada, J., Sakane, N., Takase, H., Ichikawa, H., Yonei, Y. and Ishii, K. 2013. Minor effects of green tea catechin supplementation on cardiovascular risk markers in active older people: A randomized controlled trial. *Geriatrics & Gerontology International*, 13(3), pp.622-629.
- [18] Nantz, M., Rowe, C., Bukowski, J. and Percival, S. 2009. Standardized capsule of *Camellia sinensis* lowers cardiovascular risk factors in a randomized, double-blind, placebo-controlled study. *Nutrition*, 25(2), pp.147-154.
- [19] Samavat H., Newman A. R., Wang R., Yuan J., Wu A., Kurzer M., 2016. Effects of Green Tea Catechin Extract on Serum Lipids in Postmenopausal Women: A randomized, Placebo-Controlled Clinical Trial. *AJCN. USA, P.AJCN137075*.
- [20] Suliburska, J., Bogdanski, P., Szulinska, M., Stepien, M., Pupek-Musialik, D. and Jablecka, A. (2012). Effects of Green Tea Supplementation on Elements, Total Antioxidants, Lipids, and Glucose Values in the Serum of Obese Patients. *Biological Trace Element Research*, 149(3), pp.315-322.
- [21] Sung H., Min W., Lee W., Chun S., Park H., Lee Y., Jang S., Lee D., 2005. The Effects of Green Tea Ingestion Over Four Weeks on Atherosclerotic Markers. *The Association of Clinical Biochemists*: pp 292.
- [22] Sutherland, B.A., Rahman, R.M.A. & Appleton, I., 2006. Mechanisms of action of green tea catechins, with a focus on ischemia-induced neurodegeneration. *Journal of Nutritional Biochemistry*, 17(5), pp.291–306.
- [23] Tabit CE, Chung WB, Hamburg NM, Vita JA. 2010. Endothelial dysfunction in diabetes mellitus: molecular mechanisms and clinical implications. *Rev Endocr Metab Disord*;11: pp 61–74.
- [24] Thitimuta S., Pithayanukul P., Nithitanakool S., Bavovada R., Leanpolchareanchai J., Saparpakorn P., 2017. *Camellia sinensis* L., Extract and Its Potential Beneficial Effects in Antioxidant, Anti-Inflammatory, Anti-Hepatotoxic, and Anti-Tyrosinase Activities. *Molecules Journal*: pp. 2.
- [25] Velayutham P., Babu A., Liu D., 2008. Green Tea Catechins and Cardiovascular Health: An Update. *Cur Med Chem*: pp. 1-2

The Impacts of Abusive Environment on Psychological Development of Children Depicted in Sheila, a Character from Torey Hayden's 'One Child' (A Study Case of Psychosocial by Erik Erikson)

R. Hariyani Susanti

Magister Student of Faculty of Cultural Studies
Universitas Indonesia, Depok, Indonesia
radenhariyani@yahoo.com

ABSTRACT

Personality is the dynamic and organized set of characteristics possessed by a person that influences his or her cognitions, motivations, and behaviors in various situations. Personality development is influenced by external factors such as family, friends and society. The personality development influenced by external factors is reflected in Sheila, a main character from One Child novel written by Torey Hayden. The main concern in this study is the process of Sheila's personality development and her struggle in altering her personality to gain psychosocial virtues. Finding out whether it is possible for her to get positive changes in her personality with her new social environment with the help of Hayden as her teacher and her new friends. This study reveals in the result findings how Sheila's personality development is influenced by her social environment, especially by the people around her. Because of Hayden's and her new friends' help in the special class, Sheila is able to gain the virtue of hope, determination, purpose and competency to prove that personality can be altered by the good and supportive social environment.

Keyword: Personality, Psychosocial, Epigenetic Principle, Psychosocial Virtues

I. INTRODUCTION

A child is a young human being below the age of puberty or below the legal age of majority. This is the age when a human being experiences the phenomenon known as childhood. This is the time when someone starts to learn everything from the first time; learning the first word, having the first introduction to the world and getting the first memory of his or her life. All of those experiences are going to be the foundation of one's early memories and also can help developing his or her personality. Thus the treatment one gets in the early age can affect the way he or she grows into the next stage which is the age of maturity (Meadows [1]).

Meanwhile, personality is an individual's unique variation on the general evolutionary design for human nature, expressed as a developing pattern of dispositional traits, characteristic adaptations, and integrative life stories complexly and differentially situated in culture (McAdams & Ligendahl [2]). The experience that people have in their primary age can influence the way they behave in their maturity age. Unfortunately, some people still cannot comprehend the importance of giving good treatment to children. They do bad things toward their own children by ignoring them or worse; abusing them. The latest news about child abuse was found on October 16, 2015 from the website globalnews.ca tagged as child-abuse topic entitled Parents accused of locking 6-year-old

in basement, beating him for months. This article which was reported by Meghan Matthews tells about the parents in Ohio who have been accused of endangering, physically assaulting and locking the six year old son in a basement. The son is only allowed to go out to school, after that he has to go back to the basement, eats and sleeps there. Most of the time, he gets beaten by his parents. As the child gets abusive treatment from his parents, he has problems in his personality because he does not get a proper care from his own parents.

Childhood memories can help to develop the early personality of the children. If there are some unsuccessful stages during those times, it can affect their adult stage and also the development of their personality. One of the real cases that can be studied by this theory is Sheila, a main character from the bestselling author Torey Hayden's work entitled One Child. This book has been translated into Indonesian Language entitled Sheila. This novel based on a true story of Sheila's life which is written by Torey Hayden. Hayden is an educational psychologist and a special education teacher (Marlowe, [3]).

This story tells about a six-year old little girl who experiences a bad childhood. In her early age, her mother leaves her and takes away the little brother who Sheila loves very much. Her father uses physical abuse such as whipping and spanking as punishments whenever Sheila does something bad. Her favorite uncle sexually abuses

her until she has to be taken to hospital. She does not have proper clothes because her father cannot buy her any. Moreover he does not want to receive any charities from others, she lives in migrant camp and she wets her bed until she reaches six years old. Consequently, her personality turns out to be very bad. She does not want to listen to anybody, she destroys many things, and she avenges everyone who hurts her physically and also mentally. She has a serious trust problem since physical punishment does not work on her anymore. She feels pains, but she does not want to show it. One day Sheila meets Hayden in a special class. She does not want to be open to anyone at the class and she expresses a very bad attitude. It lasts until Hayden tries to understand the root of everything, she tries to find out what has turned Sheila into the way she is. Hayden tries to gain Sheila's trust and compassion until they become very close friends.

Torey Hayden, the author of *One Child*, retells the story of Sheila's life in the book and puts herself as a first person in the story. She gains informations about Sheila by talking and communicating with Sheila. Later, she puts her analysis about Sheila in a form of literary work called novel. Besides narrations, Hayden also includes her conversations with Sheila in the book.

The writer finds Sheila's character in this novel is interesting to analyze related to her psychological condition. Sheila is a six-year old girl with an extreme psychological problem caused by mistreatment done by her parents and uncle. Her burning a boy has turned her to a phenomenal child gaining national attention. Due to the aforementioned reasons, the writer intends to analyze Sheila as the main character of the novel using psychological approach. As the theory of Psychosocial proposed by Erikson fits the issue of children development, the writer will focus on applying aforementioned theory in analyzing the novel.

A. Research Questions and Objective of the Study

According to the background, the research questions are:

1. How the abusive environment around Sheila can affect her personality?
2. how she gains the psychosocial virtues by the help from her new social environment?

Hence the objective of the study is to reveal how the abusive environment can affect the development of Sheila's personality and to reveal Sheila's process of gaining the psychosocial virtues by the help from people around her.

II. REVIEW OF RELATED LITERATURE AND RESEARCH METHOD

A. Theoretical Framework

The first theory used to complete the study is personality theory, according to James W. Kalat [4], the term personality comes from the Latin word *persona*, meaning "mask." In the plays of ancient Greece and Rome, actors wore masks to indicate their characters. Unlike a mask, however, the term personality implies something stable. Personality consists of all the consistent ways in which the behavior of one person differs from that of others, especially in social situations.

The second theory is Psychoanalysis, which is one of grand theories in psychology. According to Ryckman [5] psychoanalysis is the theory of personality development, functioning, and change created by Freud. It places heavy emphasis on the roles of biological and unconscious factors in the determination of behavior. Kohut [6], on the other hand, defined psychoanalysis as the scientific study of complex mental states.

The next framework is Epigenetic Principle. Erikson states the development functions by the epigenetic principle. This principle says that people develop through a predetermined unfolding of the personalities in eight stages. The progress of each stage is determined by the success or the lack of success in every previous stage. Boeree [7], in *Personality Theories*, illustrates the progress of this development like the unfolding of a rose bud. Each petal opens up at a certain time, in certain order, which nature, through its genetic, has determined. If someone interferes in the natural order of development by pulling a petal forward prematurely or out of order, he or she will ruin the development of the entire flower.

Each stage from the eight stages by Erikson involves certain developmental tasks that are psychosocial in nature. There are some goals that have to be done in the specific number of age. However each stage has a certain optimal time as well. There is no use forcing the children to do things in a rush. Each stage, according to Erikson, is marked by a particular psychosocial crisis. Crisis, according to Ewen (2003, p. 187), is in the medical sense of a crucial turning point for better or worse that occurs during personality development. Each crisis is brought on by the children's physical growth and the greater demand made by the society and the parents.

The outcome of every stage is not necessarily permanent. The outcomes of psychosocial crisis are psychosocial virtues, maladaptations and malignancies. Virtue, or psychosocial strength, is the good moral which

individual gains when he or she succeeds negotiating with the crisis. It can be considered as the positive outcome. Whereas malignant tendency and maladaptive tendency are the bad results when the individual cannot negotiate his or her crisis well.

Boeree [2] explains in his book entitled *Personality Theories* about the two results that is:

A malignancy is the worse of the two, and involves too little of the positive and too much of the negative aspect of the task, such as a person who can't trust others. A maladaptation is not quite as bad and involves too much of the positive and too little of the negative, such as a person who trusts too much.

Therefore, malignant tendency is a condition which occurs to an individual when he or she gets less positive side of the stage, for example in the first stage the malignant tendency is "too much mistrust". As for the maladaptive tendency, the individual has too much positive side of the stage as in too much trust which is not good either, he or she can turn out to be a gullible person.

- *The Oral-Sensory Stage: Basic Trust Versus Mistrust*

The first stage occurs during the first year or approximately year and a half of infant's life. The task in this stage is for the infant to develop trust without completely eliminating the capacity for mistrust. If a balance between trust and mistrust is achieved, the infant will develop the virtue of hope, the strong belief that even when things are not going well, if they do their best, it will work out well in the end. Parents who are overly protective of the child will lead the child into the maladaptive tendency that turn the child to be overly trusting and even gullible. This child later on cannot believe anyone would mean them harm or trouble. The worse outcome is when the child goes too far in the mistrust side. He or she will develop the malignant tendency of withdrawal which is characterized by depression, paranoia and possibly psychosis.

The writer believes this is one of the reasons why Sheila has a hard time trusting others, especially Hayden, at first. She puts the blame on herself when her mother leaves her at the early age therefore she does not believe there are people who actually love her. It happens because in the children's early age, the first significant relation they develop is with their mother.

- *The Muscular-Anal Stage: Autonomy Versus Doubt and Shame*

The second stage occurs from about eighteen months to three of four years old. The task is to achieve a degree of autonomy while minimizing shame and doubt. If the child successfully completes the task, he or she will develop the virtue of determination or willpower. There is also the maladaptive and the malignancy in this stage. Although shame and doubt are negative outcome, yet without it the child will develop the maladaptive tendency called impulsiveness, a shameless willfulness that can lead the child to jump into things without consideration (Boeree [2]). However, surely, too much shame and doubt can lead the child to the malignancy called compulsiveness. A fearful attitude if something is not done perfectly.

- *The Locomotor-Genital Stage: Initiative Versus Guilt*

This is a play stage. It occurs when a child is three or four to five years old. In this stage, the task is to let the children learn initiative without too much guilt. Boeree [2] stated that initiative means a positive response to the world's challenges, taking on responsibilities, learning new skills, feeling purposeful. At this stage, parents can encourage the children to explore their ideas. Parents should accept children's imagination, fantasy and curiosity.

Too much initiative and too little guilt means a maladaptive tendency called ruthlessness. The ruthless person is initiative, but they do not care about others who they have hurt along the way. The extreme form of ruthlessness is sociopathy or also known as antisocial personality disorder. On the other hand, there is also malignancy that is called inhibition. The inhibited people will not try things because too much guilt. A good balance, according to Ewen [7], enables the ego to develop the quality of purpose, or the courage to envisage and pursue valued goals uninhibited by the foiling fear of punishment.

- *The Latency Stage: Industry Versus Inferiority*

Based on Santrock [25], this stage happens during elementary school. Children's initiative takes them to many new experiences. They concentrate their energy to the mastery knowledge and intellectual skill. The task which the children have to overcome in this stage is developing industry without avoiding inferiority. The danger in this period is that children may fail to learn new things and as a result develop feelings of inferiority (Ryckman, [24]).

Too much industry leads to maladaptive tendency called narrow virtuosity. This is the case of the children

who are forced to be competent in one area without allowing them to broaden their interest. This is the case of child actors, child athletes and child prodigies of all sorts. The common malignancy is called inertia. This includes the people who suffer from the inferiority complexes. The good balance of this stage is the balance development of industry and inferiority or to be precise the industry with just a hint of inferiority to keep people sensibly humble. That is the virtue called competency (Boeree, [2]).

To sum up, there are eight stages in epigenetic principle from Erik Erikson. All of them explain the development of personality from infancy to adulthood. In this thesis, the writer will only apply four stages; they are the first stage to the fourth stage. Those stages are applied in the analysis because the writer will analyze the character Sheila who is a six-year old girl.

B. Previous Studies

There are some previous studies that have similarities with this research. The first one is the study conducted by Izzatur Rahmaniyah [23] from Universitas Brawijaya entitled Personality Development Influenced by Society in Novalee Nation of Billie Letts' Where The Heart Is. The significance of this study for the writer's study is the appliance of the theory by Rahmaniyah. Rahmaniyah's study helps the writer to understand more about the application of psychoanalysis to a literature's character. With different object, whereas Rahmaniyah uses Novalee and the writer uses Sheila, Rahmaniyah explains the theory and the application of the theory in a clear way.

The second study is written by Shito Rarastri HP [12] from Universitas Brawijaya entitled defense mechanism applied by the main character in The Other movie. Shito Rarasati uses psychoanalysis theory by Freud with the defense mechanism as her concentration. The object that Shito use is movie meanwhile the writer uses novel. Yet, despite of the difference in the object, Shito's study helps the writer to understand the appliance of psychoanalysis theory by Freud in general. Shito also analyzes the development of character, except the writer only studies the development of the main character instead of all of the characters from the novel. The significance of Shito's study for the writer's study is to help the writer to understand more about psychology in general because Shito describe the theory in the appliance of it in her study therefore the theory became more understandable.

C. Research Method

- *Deciding on the Object Material*

To conduct the study, the writer reads some novels to find crucial issues and One Child is chosen because amongst other novels, One Child has an interesting and intriguing issue to discuss. This novel is the debut novel for Torey Hayden and soon it becomes a best-selling novel around the world since 1980. Sheila is the first child she writes in a form of novel for people to read. The topic about how childhood experience influences the development of children and a child's personality are some considerations for the writer to choose this novel.

- *Collecting the Data*

To support the research, the writer collects some data from Brawijaya Library, Self Access Center FIB and some online library such as bookfi.org and doaj.org. The writer reads some material related to the study such as journals, articles, web articles, text book about psychoanalysis and the journals that related to the subject matter.

- *Doing Selection of the Research Materials*

In this step the writer eliminates some materials that has no relation to the subject matter and only uses the material that has important relation to the study.

- *Analyzing and Interpreting the Data*

After selecting the material, the writer analyzes and interprets the data by applying psychosocial theory proposed by Erik Erikson [6].

- *Drawing conclusion*

After doing the analysis, the writer comes to some conclusions that are presented in the last chapter of the study.

III. FINDINGS AND DISCUSSIONS

As the main character in One Child, Sheila has a dynamic character meaning that she endures some changes in attitude and behavior. One Child exposes how Sheila's personality is a reflection of what happened to her during her growth. It is related to how she is raised by her parents and how the environment influences her personality. The changes in Sheila's personality do not happen because of many factors and it happens in stages for some periods of time. Since this thesis emphasizes on the external's influence to Sheila's personality development, the findings in this thesis focus on the process of these changes which is influenced by the external factors such as the her teacher.

Based on the Personality Development Theory of Erick Erikson [6], it is found that Sheila's negative

personality is fundamentally caused by the improper treatment of her parents and uncle. Her troubled early phases of her life lead her to what are called malignancies and maladaptiveness. Fortunately she meets with Heyden, her teacher, who tries to improve Sheila's personality. By the help of Heyden and some people around her Sheila struggles to gain some virtues that she is lack of.

A. Sheila's Malignancies and Maladaptiveness

Sheila's character in the novel is portrayed as a little girl with psychological problem in which she shows some bad attitudes. Torey Hayden is not only the narrator but she is also involved in the novel as one of the characters. The narration in the novel is the result of Hayden's observation toward Sheila and her conversation with that little girl. Sheila trusts Hayden therefore she is willing to talk to her. Sheila shares the information about her childhood, her experience in abusive treatment and about her mother to Hayden.

Due to her maladjustment to childhood, Sheila has fixated in many stages proved by her personality. Instead of gaining the balance result for every stage in the epigenetic principle, Sheila fixates herself in them. Proving that she incompletes the process of development in all of the four stages, therefore she has malignant and maladaptation tendencies. Here are the findings of each tendency Sheila attains.

a) Sheila's Lack of Trust

In the first stage, infant's development is about familiarity, consistency and continuity that parents can provide. It will build up the feeling that the world is a safe place to live. The infant will learn that people are dependable and compassionate. Although it is mostly the relationship and the interaction with the mother, the father also needs to be around.

Even though Sheila does not provide the narration of her first year of life in the novel, the fact that her mother leaves her and throws out of the car by the age of four implies that Sheila's mother does not provide her with enough affection an infant should have received. It implies that Sheila does not have a connection with her own mother. Additionally, the fact that Sheila still wets her bed until the age of six proves that her parents does not potty train her properly. Moreover, her father will punish her using whipping whenever Sheila wets her bed. Her parents do not provide her with familiarity, consistency and continuity, nor convince her that people are dependable and compassionate. On the contrary, her parents abandon and abuse her during her growth.

The task to be completed in the first stage is to develop trust without completely eliminating the capacity of mistrust. However Sheila finds it hard to trust others completely, which indicates she does not have balance in the process of development in her first year of life. Her balance in the trust and mistrust issue is tipped over on the mistrust side, therefore it indicates she develops malignant tendency.

The indicator of malignant tendency is withdrawal, suspicious, apprehensive, and depression. According to Erikson, it will happen if the parents are unreliable and inadequate, if they reject the infant or harm it, if other interests cause both parents to turn away from the infants needs to satisfy their own instead (Boeree [2]).

Although in the novel there is no explicit description of rejection from her parents during her early age, Sheila tells the story of her mother left her when she is a four years old little girl.

"You know what my Mama done though?"

"No."

"Here, I'll show you." She lifted the other leg up and pointed to a scar. "My Mama she take me out on the road and leave me there. She push me out of the car and I fall down so's a rock cutted up my leg right here. See." She fingered a white line. "My Pa, he loves me. He don't go leaving me on no roads. You ain't supposed to do that with little kids."

"No, you're not."

"My Mama, she don't love me so good." (Hayden, [11])

The conversation between Hayden and Sheila above tells the rejection Sheila receives from her mother. She believes that her mother does not love her.

The first source of love that she should receive is from her mother but her mother let her believe that the mother does not love her. Even more, the mother does not only reject her but also harm her by throwing her in the highway until it leaves a scar in Sheila's body. It is kind of a reminder for Sheila that her mother has hurt her. This leads Sheila to be suspicious to others. Even in the first day of her class when she meets Hayden for the first time, she becomes very guarded.

Another indicator of malignant tendency is withdrawal or isolation. It is when the children do not want to participate in the social community or communicate to other children.

Sheila does not want to communicate with her new class. It is because she is suspicious of others, or she does not want to have an attachment to them that when they leave, she will get sad. She has an anxiety towards abandonment too. According to James W. Kalat [13],

attachment is a long-term feeling of closeness toward another person, and it is important for infants to build their first attachment in this early stage.

About the anxiety, according to Mary Ainsworth (1979) in her research Strange Situation, there are some response that children will give toward their mother and stranger. One of the responses is Anxious (Resistant) Responses toward the mother fluctuate between happy and angry. The infant clings to the mother and cries profusely when she leaves, as if worried that she might not return. When she does return, the infant clings to her again but does not use her as a base to explore a room full of toys. A child with an anxious attachment typically shows many fears, including a strong fear of strangers (Kalat, [13]).

Sheila shows this response toward Hayden as if Hayden is her mother. It can be safely concluded that Sheila projects Hayden, her teacher, as her mother because she is fixated in this stage. In addition, Hayden has been a figure that wants to love her, cuddles her and listens to her compassionately.

For all of her six years she had been unwanted, ignored, rejected. Pushed out of cars, pushed out of people's lives. Now there was someone to hold her and talk to her and cuddle her. Sheila soaked up every little bit of intimacy I could spare. Despite the inconvenience of losing those two hours of planning time, I felt less anxious about dragging her around all day hanging on my belt and ignoring her while I worked with the other children, because after school she had me all to herself. (Hayden, [11])

When Hayden wants to leave the town for her job for two days, Sheila shows the anxiety as if Hayden will not come back anymore. She does not believe Hayden's word when she said that she will come back eventually. In Sheila's perspective, based on her life experience, people she cares will not come back to her in the end, thus she shows the anxiety response.

"I ain't never, never gonna like you again. I ain't never gonna do anything you ask. You do be so mean to me. You tame me so's I like you and then you leave. You ain't supposed to do that, don't you know? That be what my Mama done and that ain't a good thing to do to little kids. They put you in jail for leaving little kids. My Pa, he says so." (Hayden, [11])

The conversation above implies that besides anxiety, Sheila appears to be scared to be abandoned like her previous relationship with her mother. Although after Hayden explains over and over again that she will be back, Sheila does not trust her. It shows that she has the

malignancy and has not achieved the balance of basic trust and mistrust in the first stage. However she will have the journey to achieve them which will be explained in the next sub chapter.

In the process of gaining the virtue of hope, at six years old, Sheila's trust is endangered by her favorite uncle. She is raped by her uncle who just gets released from the jail. Sheila trusts the uncle at first because he wants to play with her whenever she is home and accompanies her. Sadly he ruins the trust that Sheila gave. She is even afraid to tell Torey about what happened because her uncle threatened her.

The rape incident happens when Sheila is wearing the dress that Chad, Hayden's boyfriend, bought her. There is so much blood in the dress that her father throws the dress away. It traumatizes Sheila that, consequently she does not want to wear the dress again. She chooses to wear her old clothes and tries to forget her fantasy about beautiful dresses when she actually used to love wearing beautiful dress. She even confesses her adoration for dress in the conversation with Hayden.

Long after the rape incident, Chad buys her a new dress again for her play in the mother's day stage as her costume. However, instead of getting excited for it, Sheila gets shocked in disbelief and almost loses her trust to Chad too. Because of her previous experience with dress and her trust problem, she thinks that Chad will do the same thing to her if she wears a dress. She is projecting that all men have the same intention as her uncle Jerry. She believes what her uncle told her, that what he did to her is a love between adult, which Hayden rebuts. Hayden has to explain to Sheila that what her uncle has done to her is wrong. That is not love.

Fortunately, because Hayden is patient enough to explain it to her, she gains her trust again toward Chad and she is willing to wear the dress. She no longer associates a dress with the rape incident.

- *Sheila's Lack of Autonomy*

In the second stage of development, the muscular-anal stage, parents should permit the children to explore and manipulate their environment. If it is done, the children will develop a sense of autonomy or independence. On the way around, laughter or anger at toddlers' efforts can lead the children to feel deeply ashamed and give the result which they will come to doubt their own ability.

Sheila does not clarify explicitly in the novel about how this stage goes, however from the way she becomes compulsive toward every assignment that was given to her, it can be concluded that she develops malignancy in this stage. She becomes a compulsive person. According

to Boeree [2], the compulsive person feels as if their entire being rides on everything they do, and so everything must be done perfectly. So if Sheila makes mistakes, she will blame herself entirely and feel ashamed regardless the task being too hard or not.

Instead of seeing other possibilities or other factors that can cause the problem, Sheila blames herself and feels sorry about it. It is caused by her father, who is the significant figure that can build up her self-esteem, blames her too for bad things happen to them. He blames her for the reason her mother leaves them, he blames her for the reason her mother took his only son, and he blames her for turning into a destructive child.

Her father tells Hayden that she is not her daughter and uses some inappropriate languages when Sheila is around. Hayden herself feels sorry toward Sheila. The parents should not discourage the child, but neither should they push. Her father treats Sheila as if she is an adult when she still is a little girl. However it is difficult to change Sheila's perspective because that is the sentence her father told her every day and her father is a person closer to her. Her father is the only person she meets continuously. Thus she has such a low opinion towards herself.

This second stage is also when the children become aware of their body and they should become comfortable to do what they want because this stage is called anal-muscular stage. Instead of leading Sheila to be comfortable to go to the bathroom, her father just punishes her when she urinates. Logically, her father should be the one who trains her first so that she can clean herself properly, but he assumes that Sheila knows by herself. Whenever she does not go to the bathroom and wet the bed instead, she gets punished physically.

She also confesses that she is ashamed of it. Urinating should be a natural process that everybody goes through but she feels ashamed of it. This second stage is about achieving a degree of autonomy while minimizing shame and doubt. But Sheila feels more shame and doubt, therefore at this stage she develops malignant tendency of compulsiveness. She is fixated in this stage too, therefore she still wets her bed on most nights.

Sheila's father has doubt toward her, that he does not believe her. He always accuses her of stealing hence the low self-esteem. The parents should have faith to their children if they want the children to be confident.

Sheila heavily blames herself for whatever happens. She thinks if she does math better, her mother will stay. Regardless the fact that the task is for five grader. She thinks she is not bright enough to make her mother stay. She does not know the basic knowledge about human

relationship and interaction. Because of this reason also, she sometimes covers her fear of incompetence by ruining the paper for the assignment that drives Hayden mad.

For her own self-esteem, sometimes she does something excessively to get approval from others. She wants to show that she is worthwhile and people should love her. She does not know the right way to do it. She seeks the approval from papers that her classmates wrote and also from Hayden. Actually, the notes are meant to boost the children's confidence and encourage them to do good things, but Sheila at that time considers them as how much she is worth by the amount of the paper. Thus she counts the notes that she gets every day.

Sometimes she also wonders why some people can easily be loved and compares them to herself. Later she will find out the reason with Hayden's help in the pursuit of determination which will be explained in the next sub chapter.

- *Sheila's Ruthlessness*

The third stage is supposed to be the age where the children like to play. The people who are responsible around the child are family. At this age, the task to be completed is for every child to learn initiative without too much guilt. According to Boeree [2], initiative is a positive response to the world's challenges, taking on responsibilities, learning new skills, and feeling purposeful. If children can imagine the future, if they can plan, they can be responsible as well, and guilty.

For Sheila, however, she is a destructive child and she has no guilt at the first time she meets Hayden. Even Hayden knows about Sheila in the first place from the paper that informs a girl who burns a boy in a tree.

Sheila shows that she has no guilt, she has plan, but she does not care about other's feelings. It is the proof that Sheila gets the maladaptation tendency that is ruthlessness. Too much initiative and too little guilt. She is very ruthless. On the first day she is in class at lunch, she murders the goldfishes ruthlessly by poking their eyes out. She makes everyone at that place feels terrified. She does not feel sorry for killing the fish and she does not care that people feel horrified because of her.

When the lesson starts in the class too, she intends to not following the class. She does not care that Hayden wants her to participate. Sheila shows that she does not care by behaving.

There are many incidents in the novel that is showing Sheila's ruthless attitude. When Hayden leaves her for work in the outside of town, out of her anxiety that Hayden may never comeback, Sheila turns into a destructive person again and ruin the class. Moreover,

Sheila does her revenge in cruel way too. She does not care about what people will feel after she has done the revenge, she only knows that those people have hurt her, consequently they deserve it.

It takes a big part in Hayden place to handle Sheila, to invite her without punishing her physically and persuade her until she believes that not everyone will treat her badly. Later she will learn what guilt is, which will be explained in the next sub chapter.

- *Sheila's Excessive Sense of Inferiority*

Neighborhood and school are responsible in the fourth stage to help the children to complete things and to make things together. In the third stage, the children love to play games, but what differs them with the children in this stage is they start to care about the rules of the game and finish the game. The children also learn the social skill that society requires. Children have to know that there is pleasure in conceiving a plan as well as carrying it out.

Sheila has a poor social skill at the first week of school. She isolates herself, ignores people who invites her to talk. She also carries the attitude that if she does not succeed the first time, why tries again. This indicates she has malignant tendency of inertia, which means the development for her in this stage does not balance. She has inferiority complex regarding her ability and she is apathy.

She is very fragile about people correcting her work. She previously also has the tendency to tear the paper of assignments because she is worried too much whenever she gets things wrong. However after a long process she learns to face the fear.

One of the factors of malignancy in this stage is when a child has a social problem. Sheila is not only does not have friends in the class, but she also does not have friends in the place where she lives with her father. She has problem to socialize to other people her age or even older than her. The writer has mentioned in the previous chapter that Sheila does not know the basic knowledge about interpersonal relationship because no one has taught her before. However later she will learn about it which will be explained in the next sub chapter.

B. *Sheila's Gaining The Virtues*

In the novel, Sheila shows some changes in her personality. Hayden writes the process of how Sheila starts to learn the basic knowledge of interpersonal relationship to connect with others and how to overcome her fixation. Therefore, in the process of gaining the balance for every stage that Sheila has fixated, she gets many helps from her surroundings. It comes from

Hayden as her teacher, her friends from the special class and also from Anton and Whitney who becomes her friends too. Here are the virtues Sheila gains in her one year class with Torey Hayden.

- *Virtue of Hope*

The sign of someone has achieved the virtue of hope, which is the virtue that should be gained in the first stage, is when they can answer the typical question from Erikson [6]; is my social world predictable and supportive?. It is also when the children have the faith that although it is going to be difficult, everything will work out well in the end.

Sheila goes through this phase step by step in her one full year class with the help from Torey Hayden. She starts to believe that there is someone who cares about her and that not all people who leave her indicates that they hate her. At first, of course, Sheila does not believe it.

The fact that Sheila believes that she is not loved is true. Her father always tells her that she is a crazy child and sometimes punishes her physically therefore the appearance of Hayden who is just her teacher amazes her. She craves more and more attention from Hayden as she comes to trust Hayden.

At first week of school, Sheila does not even like when someone touches her. She will be very mad and furious. However when she turns to trust that person, she wants to be around that person like the typical children. She clings to her and follows her around. Yet, although she does believe Hayden, she is not ready to trust other people like other teacher at first. No matter how often Hayden convinces her that other class will be fun too.

It happens when Hayden tries to put her in the regular class. Sheila turns to her old self again. She becomes rebellious because for her who is still in the process to trust others, the only person she can trust is Hayden and the people in Hayden's class. However, Sheila becomes more reasonable at this step, because she learns how to feel sorry after making Hayden upset. She tries to show Hayden that she is a good girl and hopes that Hayden will forgive her. She is still has the insecurity that Hayden will hate her, but she has developed the trust that Hayden will forgive her if she behaves well.

Step by step Sheila has achieved the stage where she has the secure attachment which described by Mary Ainsworth (1979) as Securely Attached. It is the response when the infant uses the mother as a base of exploration, often showing her a toy, cooing at her, or making eye contact with her. The infant shows some distress when the mother leaves but cries only briefly or not at all.

When she returns, the infant goes to her with apparent delight, cuddles for a while, and then returns to the toys (Kalat, [13]).

Sheila does not need the confirmation that Hayden truly cares about her. She does not need to follow her around and touch her to prove that she has someone to rely on when her father and her mother are not a reliable figure in her life. It is up until the point where she can let go of Hayden when the class is over after a year. She does not rebel against the idea of separation, she feels sad, but not destructive.

Although she is just a six-year old girl, she has a comprehension like an adult. She understands that separation does not mean that they have to stop loving and caring toward each other. She relies on the story of *The Little Prince* that Hayden always reads her that they can still love each other although they have to be separated. She still has the faith and hope that Hayden will always love her.

- *Virtue of Determination*

At the second stage, to gain the positive balance, the care-takers or parents should be firm but also tolerant. The question in this stage is; can I do things by myself or must I rely on others? (Kalat [13]). The task to complete in this stage is to achieve a degree of autonomy while minimizing shame and doubt meanwhile in the previous sub chapter, Sheila has more shame and doubt instead of autonomy.

Fortunately, in each progress in Hayden's class, Sheila starts to achieve autonomy and the virtue of determination. She starts to gain more self-control and self-esteem at the same time. Sheila becomes more in control of her anger and she does not throw things around her to show her anger. She can be managed more easily in the class regarding her emotion. It is related to how Hayden handles her in many ways. To cope with the children who are fixated in this stage is to handle them firm but not too firm and also be tolerant. That is what Hayden did to Sheila.

Sheila who likes to tear the paper exhaust Hayden, therefore when she succeeded to lure Sheila's interest to write, she does not directly give in it to her. Hayden makes Sheila works for it and makes her promise that she will not tear the paper again. In this way, she becomes successful to make Sheila works with paper and pen without giving her a strict lesson.

It also happens when Sheila upsets Hayden by behaving badly while she is gone. Hayden punishes her and she becomes firm about it. She does not let Sheila to

go to the fire station where other children go for their class's field trip, even though Sheila begs her.

Regarding the human relationship that Sheila did not know at first, Hayden also gives her the understanding and explains to her the way no other people has explained it to her before. Sheila does not know what makes people love each other, or what makes people likeable and capable of forgiving each other. It is her determination to be loved by others. Hayden gives explanation to Sheila.

When it is the time for the class to be dismissed at the end of the semester, Sheila is determined to behave well. She promised Hayden that she will be a good girl for her. It is a proof that she has gained her virtue of determination. She has the willpower to change to be better with Hayden's and her friends help.

- *Virtue of Purpose*

The question from Erikson for people who has completed the third stage of epigenetic principle is; Am I good or bad? (Kalat [13]). At this locomotor-genital stage, the capacity for moral judgment has arrived. The children should be able to take responsibilities, learning new skills and feeling purposeful.

For the first week of her class with Hayden and the special class, Sheila does not know what is good or what is bad, or what are guilt and the other basic knowledge about human relationships. Yet, step by step she starts to learn and she starts to feel purposeful. She starts to feel sorry, she starts making friends and she starts to take responsibility.

She builds the responsibility sense to help Susannah Joy who has difficulties to learn without being supervised. It helps Sheila to be more understand about interpersonal relationship between human. She usually just ignores people but now she knows more about helping each other.

She also starts to learn that if she throws tantrum, people will get hurt. Therefore, out of her sense of responsibility, whenever she gets angry or upset she is no longer destroying anything nor screams. She will deal with it herself and isolate herself from others.

She also develops the skill to write in Hayden's creative writing class. She gets inspired by her skills and although she never learns how to write, she is very motivated. She is in fact a genius to start with. Therefore although after a long time not writing, she can write quite well in the class.

At this stage, Sheila has achieved the virtue of purpose. She feels needed by the younger students at the class, she finds out that she can write which is how she learns her new skill and she can find what she did wrong

and apologize for it. She grows out her fixation in the third stage and continues to develop her personality.

- Virtue of Competency

The virtue of competency of the fourth stage is gained when the child develops a capacity for industry while avoiding an excessive sense of inferiority. Sheila starts to avoid the sense of inferiority by finding her source of pride, that she is capable of doing something and not getting laugh at.

Sheila finds her place and becomes more alive. She starts to socialize and makes her classmates enjoy having her around. She is no longer becomes apathy and participates in speaking and doing things which shows her competency. Her friends' reaction on having her also helps her adjusting in the class socially. Besides learning, Sheila is also capable to tell Hayden about things she already knows.

After finding in which area she is competent at, Sheila is very motivated. She can write fast and it amazes Hayden. She still hesitates about math but in writing her story, she seems to feels free. She has no pressure in this field.

In the social skill Sheila also making progress positively. Besides making friends in the class, she also socializes with her friend outside the class. This development is good for her personality development and in the pursuit of competency.

In the progress, Sheila still shows a fear of getting things wrong, but she no longer tears the paper and throws them away as much as she did in the past. She has gained her self-control and now trying to get her competency in both academic and social. Her ego learns that important tasks can be completed.

Sheila has the desire to join in the practical jokes; sometimes she also suggests her idea of jokes. She becomes more and more active in the progress. She becomes more friendly and active in class and wants to participate in the social informal activity such this practical joke. It is because she is quick to understand the situations that she cannot be fooled but she can create the jokes with Whitney.

At this point she also can console people. It shows how her ability to communicate has improved. She also offers companion when Hayden feels sad although she does not know what makes her sad. It is an improvement for someone who was an antisocial before. Sheila's social circle also expresses their concerns to Sheila's condition when she is hospitalized. They care for her indicates that Sheila has formed a bond with her friends which proved that Sheila has succeeded in making friends for herself.

She also becomes the favorite in the hospital where she is treated. It is an improvement of her personality to the better. Hayden [11] wrote, "To the astonishment of the hospital staff Sheila turned out to be one of the most popular children on the unit with a whole entourage of well-wishers coming and going each day." (p. 260). Many people visited her at the hospital, from Hayden, the principle, Chad, and Anton. She becomes the favorite also because she is a naturally beautiful child.

Sheila also realized that she has changed, she confirmed that she used to have a bad personality. Sheila confesses that she has changed and she knows better at this stage.

She nodded her head emphatically. "I used to wreck stuff all the time. But I don't anymore. And I used to not talk when I got mad. I used to be a bad girl." (Hayden [11], p. 271-272).

She also participates in the play that the class has arranged for the mother's day. She will play as Dorothy in the Wizard of Oz. She learns her lines well and plays proudly since she knows her father will be watching. She is coordinating with her classmates, Anton, Whitney and Hayden well.

Sheila played Dorothy mostly by virtue of her ability to think fast and make up dialogue quickly. Both Tyler and Sarah had wanted the part, which resulted in some not-too-good-natured arguing for a while and a near-split of the Sarah-Peter production team. But Peter seemed to have authority in casting parts and he selected Sheila. (Hayden, [11])

Finally, Sheila grows out her attachment to Hayden and her class. At the end of the year, the class will be dismissed. At first Sheila refuses the fact and she turns to be overly stubborn. She even threatens Hayden that she will behave badly again. Finally, she accepts the reality and starts to learn to live by herself knowing that someone cares about her.

Slowly Sheila began to thaw out and come to life. The books interested her and finally got the better of her timidity. Soon she was wandering around on her own, inspecting the premises. Sandy flashed me a toothy, knowing smile as we watched Sheila in silence. She'd make it. (Hayden [11], p. 307)

She finds her new class and new teacher, and she feels grateful to Hayden, her teacher. Hayden also attaches in the last page of the novel Sheila's poem sent to her after a year of their separation. The poem expresses Sheila's gratitude for all of her guidance.

IV. CONCLUSION

Erik Erikson's theory of psychosocial proves that personality does not develop only because of biological factors but also because of external factors such as parents, society and environment. Personality development which is affected by external or social factors is reflected in the main character of One Child novel, Sheila. Her personality is developed in predetermined stages. The external factors come from her father, her mother, her living environment, and her new friends; Torey Hayden, Chad, Anton, Whitney and all her classmates in the special class.

In all the four stages of the epigenetic principle, Sheila is fixated in all of them. Consequently, she develops malignant and maladaptive tendencies of every stage.

In the first stage Sheila has the malignant tendency of withdrawal in which she has major trust problem toward others. It happens because of all the rejections and abusive treatment she gets from her parents. She gets through this fixation by the help from Hayden. She convinces Sheila that people can love each other without any reasons, that not all people will harm others just because of simple things, that people who leave do not always mean they hate each other.

In the second stage she develops the malignancy of compulsiveness. She is afraid if she does not do something perfectly. It is because her father always blames her for everything. Hayden helps her to overcome this malignancy by teaching her to have determination that although she fails at something, she can do better next time.

In the third stage Sheila has too much initiative and too little guilt, thus she develops ruthless personality. She does not care if she hurts someone as long as she can reach her intention. Hayden and all of her new friends at the special class help her to understand interpersonal relationship between human that she finally understands what guilty is.

In the fourth stage Sheila develops malignant tendency called inertia. She feels inferior at first. However, with Hayden who assigns her to work harder in her work, Sheila becomes more active and achieves the virtue of competency. She makes friends, she communicates and she excels at her works in math and creative writing.

The development in Sheila's personality is the result of her surroundings' influences. Sheila's changes are the proofs that society and external factors have a big role in individual's psychological development. If the

environment and the people are bad, then the personality of someone will turn out bad too, and vice versa.

REFERENCES

- [11] Bartolotta, Theresa E., and Brian B. Shulman. (2009). *Child Development*. Burlington: Jones and Barlett Publishers, LLC.
- [12] Boeree, C. George. (2006). *Personality Theories*. Shippensburg University: Unpublished.
- [13] Cherry, Kendra. (2015). *Child Development Theories*. Retrieved October 25, 2016, from <http://psychology.about.com/od/developmentalpsychology/>.
- [14] Daiches, David. (1956). *Critical Approaches to Literature*. London: Longmans, Green & Co.
- [15] De Lauretis, Teresa. (2008). *Freud's Drive, Psychoanalysis, Literature and Film*. New York: Palgrave Macmillan.
- [16] Erikson, H. Erik. (1977). *Childhood and Society*. London: Paladin Grafton Books.
- [17] Ewen, Robert B. (2003). *An Introduction to Theories of Personality*. New Jersey: Lawrence Erlbaum Associates, Inc.
- [18] Guerin, Wilfred L., et al. (1979). *A Handbook of Critical Approaches to Literature*. New York: Harper & Row.
- [19] Hadden, John. (2015). Parents accused of locking 6-year-old in basement, beating him for months. Retrieved October 18, 2016, from <http://globalnews.ca/news/2278831/parents-accused-of-locking-6-year-old-in-basement-beating-them-for-months>
- [20] Hayden, Torey. (n.d.). *Frequently Asked Question*. Retrieved January 30, 2016, from <http://www.torey-hayden.com/faq.htm>
- [21] Hayden, Torey. (1980). *One Child*. New York: HarperCollins Publisher, Inc.
- [22] HP, Shito Rarastri. (2011). *Defense Mechanism Applied by the Main Character in The Other Movie*. Undergraduate Thesis, unpublished. Malang: Universitas Brawijaya.
- [23] Kalat, James W. (2005). *Introduction Psychology*. Belmont: Tomson Wadsworth.
- [24] Liaury, Imelda. (2004). *An analysis of Sheila's Character in One Child by Torey*
- [25] Hayden. Undergraduate Thesis, unpublished. Jakarta. Universitas Bina Nusantara.
- [26] Marlowe, Mike. (2012). *Foundations of Torey Hayden's Relationship-Driven Classroom Practice*

- with Troubled Children. Thesis, 6 (1), 94-107. Boone. Appalachian State University.
- [27] Masschelein, Anneleen. (2011). *The Unconcept*. New York: State University of New York Press, Albany.
- [28] McAdams, Dan P., & Lilgendahl, Jennifer Pals. (2010). *Personality Development*. Unpublished paper presented at the International Buddhist College, Thailand.
- [29] McManus, Barbara F. (1998). *Psychoanalytic Approaches*. Retrieved November, 28, 2015, from <https://www2.cnr.edu/home/bmcmanus/litcritassign.html>
- [30] Meadows, Sara. (2001). *Understanding Child Development*. United Kingdom: Taylor & Francis e-Library.
- [31] Mitchell, Stephen A. (1988). *Relational Concepts in Psychoanalysis*. USA: Harvard University Press.
- [32] Parkin-Gounelas, Ruth. (2001). *Psychoanalysis and Literature*. London: Palgrave Publishers, Ltd.
- [33] Rahmaniyah, Izzatur. (2014). *Personality Development Influenced by Society in Novalee Nation of Billie Letts' Where The Heart Is*. Undergraduate Thesis, unpublished. Malang. Universitas Brawijaya.
- [34] Ryckman, Richard M. (2004). *Theories of Personality*. Belmont: Thomson Wadsworth.
- [35] Santrock, John W. (2007). *Perkembangan Anak*. Jakarta: Penerbit Erlangga.
- [36] Sher, Leo. (2009). *Psychological Factors and Cardiovascular Disorder*. New York: Nova Science Publisher, Inc.
- [37] Tyson, Lois. (2006). *Critical Theory Today: Second Edition*. New York: Routledge.
- [38] Waugh, Patricia. (1989). *Freud: A Life for Our Time*. London: W. W. Norton & Company.

Effect of Empowerment of Cadres by Using Module for Changes in Nutritional Behavior in Pregnant Women in Dlingo, Bantul, Indonesia

Sari Hastuti · IinNurmaini Sembiring

Health Politechnic of Ministry of Health in Yogyakarta, Tatabumi Street, Banyuraden,
Gamping, Sleman, Indonesia
[email gitsari@yahoo.com](mailto:gitsari@yahoo.com)

ABSTRACT

The infant mortality rate in Indonesia is currently high. One of the causes is baby born with low birth weight (LBW). Prevalence of LBW in Sub-district Dlingo, District Bantul increase in three years (2013-2015) so it takes innovation to overcome them. Efforts to handle health problems are not only the responsibility of the government, but also the community. Indonesia organizes Posyandu, a community health effort in the implementation of health development, to empower the community and provide convenience to the public in obtaining basic health services to accelerate the reduction of MMR and IMR. The role of cadres in the implementation of Posyandu is very large because in addition to providing health information to the community as well as a community mobilizer to come to Posyandu, including in nutritional behavior. Unfortunately, nowadays cadres provide education to the community without a structured module so that variants of educational content, breadth of material, and tools are very varied. This study aims to determine the effect of empowerment of cadres with the use of modules for changes in nutritional behavior in pregnant women in Dlingo, Bantul. The design of this study was a pre-posttest with control group design. The study was conducted at 2 posyandu in Sub-district Dlingo, involving 10 health cadres. Total sample of 70 pregnant women consisted of 35 intervention groups and 35 control groups with purposive sampling technique. The intervention group was the group given the nutrition education in pregnant women using curriculum according to the module made by the researcher, while the control group was using leaflet and casual consultation (as usual, if needed). Data of pregnant women were obtained from primary data (research questionnaire) and secondary data (KIA book and medical record) in December 2016 until January 2017. Data analysis *paired t-test* and *unpaired t-test*. The results showed that there was an increase in knowledge, attitude, and behavior before and after treatment. There was a significant average difference between intervention groups dan control groups before and after intervention (*p-value* = 0,000 <0.05) in knowledge (*p-value* = 0,000, CI.95% 1,77- 1,04-2,5) attitude (*p-value* = 0,000, CI.95% 9,2-14,8), and behavior (*p-value* = 0,000, CI.95% 8,65-13,6). The conclusion in this research is empowerment of cadre using module have a significant effect to increase knowledge, attitude and behavior of pregnant woman nutrition.

Keyword: Empowerment of cadres, Pregnant mother, Nutritional behaviour

I. BACKGROUND

Infant mortality rate (IMR) is one of indicators that show society health level. In 2013, IMR in Indonesia was 24,5 per 1000 live births. The cause was acute respiratory infection 16%, preterm birth 19%, intrapartum complication 11%, neonatorum sepsis 6%, congenital disorders 11% and other diseases 16%.[1]. More than 20 million babies in the worl 15,5% of all births) are born with Low Birt Weight (LBW), a condition of newborn with birth weight less than 2.500 gram³. The highest IMR in developing countries is 96% in wich 16,5% were born with LBW and 6% of them wwere death[2].

The data from Ministry of Health (2015) stated that LBW case in Special Region of Yogyakarta was 9%³, and Bantul district gave contribution of 3,62%. From seventeen sub-districts in Bantul, Dlingo sub-district had the highest percentage of LBW case and there was an

increasing number of LBW case in the last three years, those are 5.5% in 2013, 8.3% in 2014 and 8.65% in 2015.

Pregnant women nutrition is one of causes of LBW [5]. The effort to prevent births with LBW is more important than facing birth with LBW by conducting good antenatal care, giving consultation or referral if there is abnormality, and conducting pre-conception care about nutrition for pregnancy preparation^[6]. Pregnant woman is one of groups that are prone to nutrition deficiency because there is an increase of nutritional need to fulfill mother and fetus needs[7]. If a woman suffers from under nutrition during pregnancy, it will lead to some risks and complications such as Chronic Energy Deficiency (CED), anemia, bleeding, abnormal mothers' weight gain, infectious diseases, difficult and prolonged delivery; for fetus it can influence fetus growth, miscarriage, abortion, died at birth, neonatal

death, congenital disorders, anemia in babies, intra partum asphyxia and born with LBW [8].

Prevalence of CED in pregnant women in Yogyakarta in 2015 was 22.6%. Supplemental Food Recovery Program for pregnant women with CED only able to fix normal nutritional status by 13%. This is because there are other factors that influence nutritional status in pregnant women with CED, those are eating pattern, food consumption, economical status, health status, job, and mothers' knowledge.

Knowledge has an important role in someone's life especially daily activities including health behavior. Knowledge is the result of 'know' and it occurs after someone is sensing certain object. Knowledge or cognitive is a very important domain in forming someone's action (overt behavior)¹⁰. Knowledge on good nutrition is expected to be in line with good attitude and behavior in nutrition fulfillment.

One of government's efforts in accelerating the decrease of mothers and infant mortality rate is through Posyandu. Posyandu is one form of health efforts that is managed and conducted from, by and for society in health development management [11].

The efforts to increase role and function of Posyandu are not only government responsibility, but also society responsibility. The role of cadres in Posyandu management is very big because other than as a health information provider for society, they also encourage the society to come to Posyandu and perform clean and healthy lifestyle including good nutritional behavior¹¹.

Due to the role of cadres who play a big role on the community, it is very necessary to prepare the cadres so that it can be a health workers extension in promoting and maintaining the quality of health as well as recognize the problem early on. There are at least 4 health cadre tasks there are monthly measuring child weight, nutrition and health counseling; nutrition packing; immunization and paralytic monitoring; and identification of diseases, provide simple health care and referrals.

In preparing the cadres, a person is chosen by the community and is willing to spend time trained using curriculum and training module for Posyandu Cadres. The materials obtained are how to manage posyandu, posyandu cadre task, assess health problem at posyandu target, community mobilization, posyandu activity and its development, counseling, and reporting/ recording. The subject of nutrition is one of the subjects in the main duty of posyandu cadres. But the module has not discussed in detail the material on nutritional fulfillment in pregnant women, so there is considerable variation in providing the material.

A preliminary study conducted at Puskesmas Dlingo on six women with a history of LBW showed that CED

and anemia were caused by malnutrition status. The number of midwives at Dlingo Public Health Center is only six midwives for the population (19.352 people), which means one midwife per 3,225 people. This is far from the ideal midwife ratio target in 2011-2025 (100 midwives per 100.000 population)³. Mothers who visited posyandu were given knowledge on nutrition, some of which were passed (not awarded). Knowledge of nutrition is given in questions and answers by cadres. Counseling is usually performed by midwives from puskesmas (community health center).

The number of midwifery that does not meet the target yet, the high number of LBW cases in Dlingo, and cadres' abilities in transferring knowledge about nutrition make the researcher interested in stop the LBW cases chain by empowering cadres in changing healthy nutritional behavior using structured modules so that it can be used as a reference in giving counseling to pregnant women.

This study aims to determine the effect of empowerment of cadres with the use of modules for changes in nutritional behavior in pregnant women in Dlingo, Bantul.

II METHODS

The design was Quasy Experiment Design, used pretest-posttest with control group design. This research was conducted at Posyandu Purnama, Dlingo on November 20, 2016 until January 20, 2017. The population in this study was all pregnant women in Dlingo (149 pregnant women). Research subjects consisted of intervention groups (ie groups of pregnant women given nutritional education by cadre according to curriculum in module made by the researcher) and control group (ie group of pregnant women given nutrition education by cadre using common method, giving leaflet and consultation / Questions answered if deemed necessary). Each group each taken 35 subjects of pregnant women, so the overall number of samples was 70 respondents. Sampling technique using purposive sampling. Inclusion criteria was literacy, willing to be a research respondent. Exclusion criteria were the mothers who have health education background.

The independent variable in this research is the use of module by cadre in providing nutrition education; Dependent variable that is knowledge, attitude and behavior; And characteristic variables such as age, education, occupation and information. The data scale of the independent variable is nominal, the dependent

variable is the nominal and the interval and the characteristic variables are nominal and ordinal. Data collection was done by using secondary data derived from medical record and MCH book, and primary data was taken by questionnaires filled by respondents at the time of pretest and posttest. Pretest was done on the first day before the intervention was given and posttest was done in the next month (during repeat visit of posyandu in next month).

Data processing techniques are done by editing, coding, entry and tabulating. The analysis of this research data is univariable and bivariable analysis, questionnaire test using product moment for validity test and reliability test using Alfa Cronbach with minimum alpha value 0,7, homogeneity test with levene's test, normality test with Kolmogorov-Smirnov and hypothesis test with paired t - test and unpaired t-test. Data analysis used SPSS 16.0 at 95% confidence level.

III RESULT

A. Univariable Analysis

Table 1. Distribution of Respondents based on Characteristics of Research Subjects in Intervention and Control Group at Posyandu Dlingo, Bantul.

| Categories | Group | | | | Total | n | % | p-value |
|-------------|--------------------------------------|----|--------|----|-------|----|-----|---------|
| | Intervention | | Contol | | | | | |
| | n | % | n | % | | | | |
| Age | Not At Risk | 24 | 49,0 | 25 | 51,0 | 49 | 100 | 0,596 |
| | At Risk | 11 | 52,4 | 10 | 47,6 | 21 | 100 | |
| Education | Higher | 3 | 50,0 | 3 | 50,0 | 6 | 100 | 1.0 |
| | Middle | 12 | 48,0 | 13 | 52,0 | 25 | 100 | |
| Level | Basic | 20 | 51,3 | 19 | 48,7 | 39 | 100 | 0,307 |
| | Housewife | 18 | 46,2 | 21 | 53,8 | 39 | 100 | |
| Occupation | Employee / work at formal insitution | 17 | 54,8 | 14 | 45,2 | 31 | 100 | 0,356 |
| | Ever | 19 | 47,5 | 21 | 52,5 | 40 | 100 | |
| Information | Never | 16 | 53,3 | 14 | 46,7 | 30 | 100 | 0,356 |

Based on table 1. shows no significant difference of respondent characteristic between intervention and control group. It is shown with p-value of each characteristic > 0.05. That means both groups have the similar characteristics of subject or homogeneous groups.

B. Bivariable Analysis

Table 2. Analysis of Paired t-test for Knowledge, Attitudes and Behavior of Intervention Group

| | Mea | n | n | SD | p-value | Mean Diff (CI. 95%) |
|----------------|-----|------|---|-------|---------|------------------------|
| Pre knowledge | 35 | 9,3 | | | | -1,73 (-2,40- (-1,06)) |
| Post knowledge | 35 | 11,0 | | 1,928 | 0,00 | |
| Pre attitude | 35 | 39,6 | | | | -11,70 (-14,5- (-8,9)) |
| Post attitude | 35 | 51,3 | | 8,006 | 0,00 | |
| Pre behaviour | 35 | 53,5 | | 6,866 | 0,00 | -10,8 (-13,2- (-8,4)) |
| Post behaviour | 35 | 64,3 | | | | |

There is a significant difference in the mean of knowledge, attitude and behavior (pre and post intervention) in the form of nutritional education by cadre by using module in intervention group.

Table 3. Analysis of Paired t-test for Knowledge, Attitudes and Behavior of Control Group

| | n | Mean | SD | p-value | Mean Diff (CI. 95%) |
|----------------|----|-------|------|---------|---------------------|
| Pre knowledge | 35 | 9,29 | | | 0,03 (-2,74- 0,33) |
| Post knowledge | 35 | 9,26 | 0,87 | 0,845 | |
| Pre attitude | 35 | 46,50 | | | 0,29 (-1- 0,68) |
| Post attitude | 35 | 46,21 | 1,12 | 0,134 | |
| Pre behaviour | 35 | 60,68 | 2,23 | 0,403 | 0,32 (-0,45- 1,1) |
| Post behaviour | 35 | 60,35 | | | |

Based on statistical results using unpaired t-test obtained p-value = 0,000 <0.05 and the confidence

interval did not pass zero. Statistically there is a significant difference of mean level of knowledge, attitude and behavior in the intervention and control group.

IV. DISCUSSION

The results of this study indicate that the majority of pregnant women in this study were in the age range between 20-35 years. Physiologically, this age range is the best time period for women to get pregnant (not at risk) [12].

The highest level of education of respondents were basic level. Data on employment indicate that the majority of respondents were not working at formal institution (housewife), and also the majority of them have been informed about balanced nutrition during pregnancy. The woman who do not work at formal institution allow respondents to have more free or flexible time to get information about balanced nutrition during pregnancy from various media. However, not all respondents who do not work at formal institution have spare time to get information. This may be because respondents tend to take care of household. In addition, this depends on the respondent's desire to obtain the information [13].

The study also found that there was an increase in knowledge, attitudes and behavior of pregnant women in both groups. However, the increase in the intervention group was greater than that of the control group. The learning module is the smallest unit of teaching and learning, learned by individual learners (self-instructional) ²⁴. The module also allows the cadres to complete mastery up to 75% so that the cadres further improve their ability in transfer knowledge, provide motivation, and evaluate the success of nutritional education given to pregnant women[23].

It is possible that the information provided by the cadres in the intervention group is more effective than information obtained through leaflets or casual counseling. This is in accordance with the theory that interpersonal communication is the most effective form of communication because communicators and communicators can directly face to face, so that the stimulus of messages or information conveyed by a direct communicant can be responded on the spot. In case of unclear messages or information received by the communicant, then at that time can also be clarified.

The significant increase of knowledge, attitudes and behaviors in the intervention group is consistent with the theory that the application of health education in the intervention group uses the sokratic (two-way) method

so that the participants are more active and creative¹⁵. This is in line with research conducted by Sumarah (2007) that two-way method is more effective in increasing knowledge 4.19 higher than with leaflet [16]. Bloom shares behaviors in three domains: knowledge, attitude and practice or action. Knowledge is the result of 'knowing', and this occurs after people have sensed a particular object. Knowledge or cognition is a very important domain for overt behavior, and behavior based on knowledge will be more lasting than behavior that is not based on knowledge¹⁰. Attitudes are determined by the individual's beliefs about outcomes for behavior (behavioral beliefs). Thus, a person who holds a strong positive belief is judged to have a positive attitude toward behavior. Conversely, a person who holds a strong negative belief of behavior will have a negative attitude toward behavior[17]. An attitude has not been automatically manifested in an action (overt behavior). To realize the attitude of being a real action required supporting factors or a condition that allows, such as facilities. In addition to facilities factor, also needed support factors from other parties, such as from husband, parents or parent in-laws and others[10].

Pregnant women with good nutritional knowledge are expected to choose good and balanced nutritional intake for themselves, the fetus and the family. Good nutrition knowledge can help a person learn how to store, process and use quality food for consumption. The results of this study in accordance with research conducted Nurhayati (2011) on health education to improve knowledge, attitude and behavior towards smoking. The analysis results show that $p\text{-value} = 0,000$ (95% CI 1.92-3.26) means that there is better knowledge and behavior to quit smoking after health education¹⁸. In addition to research conducted by Nurhayati, the results of this study are also in line with the results of Yabanci et al (2014) study that maternal nutrition education effectively improves nutritional knowledge in mothers, and mothers with higher knowledge positively affect the behavior and habits in mothers and his children [19].

Providing leaflets to the control group can influence the knowledge, attitudes and behavior of pregnant women but the increase is not significant, so it can be concluded that the information provided by Posyandu cadres using modules more effective in improving knowledge, attitude and behavior of pregnant women against a stimulus. Although the knowledge of the respondents in the control group is good, but attitude and behavior are still negative. In order to assist individuals, groups, or communities in changing their behavior, it is necessary to understand the factors that influence the ongoing and changing behavior²⁰. Things that affect a person's behavior can come from internal factors and external factors¹⁷. This is in line with the results of a

study conducted by Susanti (2014) that there is a difference of average pre and post test results on the knowledge and attitude of the mother of children under five in nutrition at Posyandu Tambak Rejo after empowering cadres with p-value value 0.000 < 0,05 [21]. Community empowerment, especially Posyandu cadres, is an effort to empower the community through the realization of their potential capabilities. In addition, empowerment of Posyandu cadres can lead to a willingness that is a tendency to perform an action or attitude to improve public health in a community [22].

V. CONCLUSION

Based on the results of this study, it can be concluded that empowerment of cadre by using module have a significant effect to increase knowledge, attitude and behavior of pregnant woman nutrition.

VI. ACKNOWLEDGMENT

This work was supported by Health Politecnics of Ministry of Health in Yogyakarta through a grant research fund for lecturer. We thank to Health Office of District Bantul, and Dlingo Public Health Center.

REFERENCES

- [1] WHO. 2015. *World Health Statistics*. Geneva: WHO. Downloaded from http://www.who.int/gho/publications/world_health_statistics/2015/en/
- [2]_. 2010. *Low Birth Weight Country, Regional and Global estimates reported based on WHO/UNICEF*. Downloaded from <http://www.unicef.org/publications/files/lowbirthweightfromEY.pdf>.
- [3] Kemenkes RI. 2015. *Profil Kesehatan Indonesia 2014*. Jakarta: Kemenkes RI.
- [4] Dinas Kesehatan Provinsi Daerah Istimewa Yogyakarta. 2016. *Profil Kesehatan Provinsi D.I.Yogyakarta*. Yogyakarta: Dinkes D IY.
- [5] Ngoma, G.M., Mackanga, J.R., Gonzalez, R., Ouedraogo, S., dan Kakolwa, M.A. 2016. *Young Adolescent Girls are at High Risk for Adverse Pregnancy Outcomes in Sub-Saharan Africa*. British Medical Journal. Downloaded from <http://bmjopen.bmj.com/content/6/6/e011783.full>
- [6] Manuaba, I.A.C., Manuaba, I.B.G.F., Manuaba, I.B.G. 2010. *Ilmu Kebidanan, Penyakit Kandungan, dan KB*. Edisi 2. Jakarta: EGC
- [7] Fatimah, St., Hadju, V., Bahar, B., Abdullah, Z. 2011. *Pola Konsumsi dan Kadar Hemoglobin pada Ibu Hamil di Kabupaten Maros, Sulawesi Selatan*. *Makara, Kesehatan*, Vol. 15, No. 1, Juni 2011: 31-36. Makassar: Universitas Hasanuddin.
- Downloaded from <http://journal.ui.ac.id/index.php/health/article/download/795/757>
- [8] Waryana. 2010. *Gizi Reproduksi*. Yogyakarta: Pustaka Rihama.
- [9] Nugrahini, E.Y., Efendi J.S., Herawati, D.M.D. 2014. *Asupan Energi dan Protein Setelah Program Pemberian Makanan Tambahan Pemulihan Ibu Hamil Kurang Energi Kronik di Puskesmas Kota Surabaya*. Downloaded from pustaka.unpad.ac.id/wp-content/uploads/2014/06/Asupan-Energi-Dan-Protein-Setelah-Program-Pemberian-Makanan-Tambahan.pdf
- [10] Notoatmodjo, S. 2011. *Kesehatan Masyarakat*. Jakarta: Rineka Cipta.
- [11] Kemenkes RI. 2012. *Buku Pegangan Kader Posyandu*. Jakarta: Kemenkes RI.
- [12] Rochyati, P. 2011. *Skrining Antenatal pada Ibu Hamil*. Surabaya: Pusat Penerbitan dan Percetakan UNAIR (AUP).
- [13] Noviard, Tuti. R., Fadilayana. D. 2015. *Tingkat Pengetahuan Ibu Primigravida tentang Tanda Bahaya Kehamilan Sebelum dan Sesudah Penyuluhan di Wilayah Kerja Puskesmas Rejosari*. Downloaded from jom.unri.ac.id/index.php/JOMFDOK/article/view/7206 pada tanggal 16 Januari 2017.
- [14] Notoatmodjo, S. 2007. *Promosi Kesehatan dan Ilmu Perilaku*. Jakarta: Rineka Cipta
- [15] Machfoedz, I. dan Eko, S. 2007. *Pendidikan Kesehatan Bagian dari Promosi Kesehatan*. Yogyakarta: Fitramaya.
- [16] Sumarah. 2007. *Efektivitas Ceramah Dan Leaflet Terhadap Peningkatan Pengetahuan Tentang Kanker Leher Rahim Pada Akseptor Kb Pil Di Banyusumurup Girirejo Bantul*. Downloaded from portalgaruda.org/article.php?article=130848&val=5478
- [17] Glanz, Karen., Rimer Barbara K., dan Viswanath K. 2008. *Health Behavior and Health Education*. San Fransisko. Jossey Bass A Wiley Imprint. Downloaded from <http://www.sanjeshp.ir/phd>
- [18] Nurhayati. 2011. *Pendidikan Kesehatan dalam Meningkatkan Pengetahuan, Sikap dan Perilaku terhadap Merokok pada Remaja di SMP Negeri Banda Aceh*. Downloaded from etd.repository.ugm.ac.id/index.php?mod=penelitian_detail&sub...act...typ
- [19] Yabanci, N., Ibrahim, K., Suzan, S., K. 2014. *The Effects of Mother's*

Nutritional Knowledge on Attitudes and Behaviors of Children about Nutrition. Downloaded from <http://www.sciencedirect.com/science/article/pii/S1877042814009872>

- [20] Notoatmodjo, S. 2010. *Promosi Kesehatan*. Jakarta: Rineka Cipta
- [21] Susanti, E.D. 2014. Pengaruh Pemberdayaan Kader Posyandu terhadap Pengetahuan dan Sikap Ibu Balita dalam Pemberian Nutrisi di Posyandu Dusun Tambak Rejo Desa Sodo Kecamatan Paliyan Gubung Kidul. Downloaded from opac.unisayogya.ac.id/303/1/.pdf
- [22] Fitriani, S. 2011. *Promosi Kesehatan*. Yogyakarta: Graha Ilmu.
- [23] Wijaya, Cece,. 1988. *Upaya Pembaharuan Dalam Pendidikan dan Pengajaran*. Bandung: Remadja Karya
- [24] Winkel. 2009. *Psikologi Pengajaran*. Yogyakarta : Media Abadi.

Nurses Preparedness for Disaster Management in Lampung Province, Indonesia

¹Tiara, ²Earnporn Thongkrajai

¹Student, Master of Nursing Science, Faculty of Nursing, Khon Kaen University, Thailand

¹Lecturer in School of Health Science Muhammadiyah Pringsewu, Lampung, Indonesia

² Associate Professor, Faculty of Nursing, Khon Kaen University, Thailand

Email: tiarayudi2@gmail.com

ABSTRACT

Indonesia has 11 categorized as disasters namely: earthquake, tsunami, volcano eruption, flood, drought, hurricane, landslide, technology failure, epidemics and outbreak of disease, social conflict and terrorism. Disaster preparedness is a very important role for all health professions particularly in nurses as it has a great impact on individual, family and community health. This descriptive study aimed to investigate nursing preparedness with regarding to their level of knowledge, attitude and skills for disaster management. The study was carried out among 136 selected nurses in three hospitals and a community hospital in Lampung Province, Indonesia. The data collection tools used included Demographic Data and Working Information Questionnaire (DDWIQ) and Nurses Preparedness Evaluation Tool (NPAT) modified from the work of Khalaileh (2009). Results showed that nursing preparedness for disaster management according to knowledge, attitude and skills were at moderate levels although it seemed that the lowest score of all was is skill component. There were some factors that appeared to have association with levels of knowledge, attitude and skills in preparedness for disaster management i.e.,: (1) There were associations between educational background, experience for caring patient and knowledge of nurses for disaster preparedness (p -value <0.01 and <0.02); (2) There were associations between educational background, experience in caring patient in disaster and attitude (p -value <0.01 and <0.00); (3) There were associations between length of working years, number of additional training and nursing skills for disaster management (p -value <0.02 and <0.006). The findings suggest further training and equip all nurses in this area related to disaster management by preparing them during their basic training as well as on the job training.

Keywords: Disaster, Nurses Preparedness, Knowledge, Attitude and skills

I. INTRODUCTION

A disaster is an event that disrupting the normal circumstances and cause impacts to society and the environment (World Health Organization, 2007). The number of disaster increased 60% in decade (1997-2007)[1] (WHO, 2007). The number of natural disaster increased in 1970-2014 was 11,985 events of which 5,139 in Asia and the Pacific (Asean Development Bank, 2005)[2]. Indonesia is part of the Pacific Ring of Fire which is a series of active volcanoes in the world. In 1927 appeared a new Island volcano, named Anak Krakatau Mountain (Child of Krakatau). The role of the nurse for disaster is the centre of the front in health services have a responsibility and role to handling patients emergency daily. Disaster preparedness is have priority for health providers because disaster can happen anytime[3] (Rogers, 2007). As the largest number in the health care provider, nurses have a play an important role in disaster management.

Nurses not only are able to respond the emergencies but also do have a right to the needed preparation for effective responses for disaster management with their knowledge, attitude and skills[4] (Wisniewsky, 2004). Nurses who have prepared with their knowledge, attitude and skills regarding to disasters can play important role and cope better when occurring⁹. Stanley (2005)[5] stated that the nurses who have qualification of assessment skills, communication, priority settings, collaboration, and they are also be a critical thinkers

who can make essential decisions in emergency conditions. Previous research showed that 80% of the nurses was not fully prepared to respond disaster and only 20% of the nurses was prepared adequately[6] (Leodoro, 2015).

The nurses need more education in disaster management, most importantly in their roles during responding to disasters. Nurses perceived themselves as not well-prepared but they are willing to improve their knowledge, skills and attitude in preparedness of disaster management if educational opportunities are provided. Most of nurses agreed knowledge, skill and attitude regarding the preparedness of disaster management are very important.

II. OBJECTIVE OF THE STUDY

The aimed of this study was to investigate the levels of nurse's preparedness in accordance to knowledge, attitude and skill in disaster management in Lampung Province, Indonesia.

III. METHOD

A. Design

A descriptive cross-sectional survey was used to explore the level of nurses' preparedness.

B. Setting and Sample

The participant was selected from randomized sample of three hospital and one primary care unit. The total sample in

this study are 136 sample nurses with inclusion criteria include : Nurses who had at least diploma degree, had at least 1 year work experience, professional or register nurse who work full time and agreed to be participated. All nurses who met in the inclusion criteria were invited to participate.

C. Data collection and Research Instruments

Data were collected through self-administered questionnaires using NPAT (Nurse Preparedness Evaluation Tool) between February to March 2017. This instrument was validated by four experts. The Cronbach's alpha coefficient was 0.95. The scale of this instruments from 1 to 4 (strongly agree to disagree).

D. Data Analysis

The data in this study was analyzed using the statistical package for social sciences (SPSS) 20 program with the statistically significant level at 0.5. The analyses included demographic data of respondents and the level of nurse's preparedness in on disaster management.

IV. RESULTS

Table 1. Level of nurses preparedness in accordance to knowledge, attitude and skills

| Variables | Level | $\bar{X} \pm SD$ |
|-----------|----------|------------------|
| Knowledge | Moderate | 31.3 \pm 0.74 |
| Attitude | Moderate | 34.2 \pm 0.50 |
| Skills | Moderate | 26.6 \pm 0.78 |

At the time data collected was conducted the population of nurses numbered approximately 136 nurses. Results show that nursing preparedness for disaster management according to knowledge; attitude and skills are at moderate levels although it seemsthat the lowest score of mean score is nursing skills.

Table 2. Association between factor related and nurse knowledge, attitude and skills on disaster preparedness

| Variables | Factors | <i>p-value</i> |
|-----------|------------------------|----------------|
| Knowledge | Educational background | 0.01 |
| | Experience | 0.02 |
| Attitude | Educational background | 0.01 |
| | Experience | 0.00 |
| | Length of working | 0.02 |
| Skills | Training | 0.06 |

There are association between educational background, nurses experience in caring patient and knowledge of nurses

for disaster preparedness (*p*-value <0.01 and <0.02), There are association between educational background, experience in caring patient in disaster and nurse attitude (*p*-value <0.01 and <0.00). There are association between nurses who has been working longer, training and nursing skill on disaster management (*p*-value <0.02 and <0.006).

V. DISCUSSION

In this part will be explain in four parts according to the research objective namely (1) Demographic characteristics of nurses (2) The level of nurses preparedness in accordance to knowledge, attitude and skill for disaster management (3) Association between demographic data and nurses preparedness.

A. Demographic characteristics

The majority of nurses who are married is (84.6%) and more than half of the sample is (64.7%) female, in Indonesia the number of nurse female more than male. The women are still majority in nursing field in Indonesia, although one-third of them is male. Most of the nurses are aged 30 - 40 years old (44.1%), and one-fourth of them (25.7%) is 40 years old.

The respondents who have no experience in disaster is (52.9%). Regarding length of working experience, nurses who have been working for 5-10 years is (48.5%). However, more than half of the respondent had nursing education at diploma degree (52.9%). Regarding to training one-fourth of nurses attending Basic Training Life Support is 27.2%. However, there are nurses who have never attended any training is (12.5%), only 8.8% of nurses have attended disaster management training.

B. Training and education

The finding of this study show that more than half of the respondents had an educational background at the diploma level were (52.9%) respondent, and only (8.8%) had master level. It means that the majority of respondent had low educational background. In Indonesia diploma level is the low level in nursing education.

The subjects who had formal education at the diploma degree possibly have a poor knowledge to prepare their skills in disaster response. According to Chan (2009) [7] found that the nurses in diploma degree had poor of knowledge and skill than bachelor, master or doctoral students in clinical management system.

However, Lampung province is one of the most vulnerable province to natural disaster in Indonesia, but there are more than half of nurses did not have experience in caring for patient with disaster (52%) and there is (13.2%) nurses never attended any training on disaster management. Training for nurse is the important aspect to handling the patient with disaster.

C. Experience in caring patient with disaster and length of working

Previous work experience in critical situations requiring nurses to maintain their readiness specialized knowledge and skills[8] (Nasrabadi, 2007). The nurses who had previous experience can guide nurses to increase their confidence on disaster management.

Nurses should be equipped with their knowledge and skills to work on disaster. However, in this study more than half of nurses did not have half experience in disaster (52.9%).

Suserud and Haljamie (1997)[9] stated that the experience will be related to readiness for action in response to the disaster. A readiness measure to have the feeling that this set is found by a nurse who has previous experience is not certain experienced nurses.

This study also found that near half of nurses who have been working for 5-10 years is (48.5%). Nurses who have longer work experience might be more prepared to handling patient with disaster.

D. Level of nurses preparedness in accordance to knowledge

In this study, the level of knowledge of nurses for disaster management was found to be at moderate level. The finding showed that more than half of nurses had moderate level of knowledge for disaster management is 46.3 %. This finding can be explained with the educational background of the respondents had an educational background at the diploma level is 54.4%.

Educational level of the respondents might have played an important role in the results. Diploma level might have indicated a limited existing knowledge for tsunami responses usually dealing with complicated problem such as insufficiency of skill in seeking information and limited capability to develop further advanced clinical skills in responses to complicated health problem, nurses who had formal education diploma level might have a lack of knowledge to prepare their skills in disaster responses.

It was also found that there is 27.2% nurses had low level of knowledge regarding to disaster preparedness. Based on Indonesian National Nurses Association the diploma level is the lower level in the nursing educational system and the curricular program starts with the 3-year. The bachelor level have to increase their knowledge. Continuing education should be held for the nurses [11](Husna, 2011). In line with Chan (2009) nurses whose education were the diploma level showed that lower level of knowledge and skill than bachelor, master or doctoral students in clinical management system.

The second reason that might have influenced the moderate level of knowledge of nurses is experience in caring for patient patients. More than half of respondents 52.9 % did not have experience in caring with disaster preparedness. In this study found that there is association between education and knowledge for disaster management were p -value <0.001.

This result can be explained that many factors that contributed for the level of knowledge of nurses' preparedness for disaster management. Supported study by Rahmawati (2009) [12]

reported perceived preparedness of knowledge in caring for patient with disaster was at moderate high level.

Grant (2002) [13] cited that nurses should be knowledgeable about their role during disaster; this may include triage, coordination of the first aid response team and direct care to victims of the emergency. As licensed health care professionals, they should respond to all serious events that threaten the health, safety or well being of a population. Contrary study by Husna (2009) reported that training and education was not significantly correlated with knowledge. It was found that the nurses were not trained and had limited direct experience in acute response care for caring patient with disaster.

In the other hand (Gould et al, 2007 cited in Husna 2011), stated that Education and training provide opportunities for the development and application of knowledge and skills to meet the demands of current roles and functions needed for effective and efficient disaster responses.

This finding shows that the low of mean score of the nurses preparedness accordance to knowledge was "identifying risk and taking suitable action to prevent a disaster" which means that the nurses need to increase their knowledge how to reduce the risk and how to prevent disaster in the future. This finding can be explained that there are 17 (12.5) nurses never attended training and more than half of respondents were 72 (52%) didn't have experience in caring patient with disaster.

The study by Johnson (1999) pointed that nurses who have experienced in disaster management such as transferring patient to the hospital will be better than nurses who didn't have experienced. The nurses had learned a better technique of transferring that reflected into there was a correlation between experience nurses in handling patients with transferring technique performance.

According to Fung et al. (2009), reported that there is a lack of understanding regarding nurses' perceptions of their roles and preparation for providing safe and effective care during and after a disaster. Thus, nurses should gain more knowledge regarding disasters and emergencies. On the other hand Burstein (2006) explained that self-preparedness is very important for future disaster occurrences. Rowney & Barton (2005), stated that disaster preparedness will determine their successfulness in responding and recovering from disastrous events.

E. Level of nurses preparedness in accordance to attitude for disaster management

In this study the attitude of nurses for disaster management at moderate level is (44.9%) followed by nurses who had low level is (39.7%) and high level is (15.4%) nurses. The moderate level of nurses attitude for disaster management may indicate that more than half of respondents didn't have experiences with disaster is (52.9%). According to Suserud and Haljamie (1997) stated that the experience will be related to readiness for action in responses to the disaster, nurses who

had previous experience can guide nurses to increase their attitude and confident.

The lowest mean score of nurses preparedness accordance to attitude was “training and education related to disaster preparedness can increased self confidence and a better understanding in disaster responses. It means nurses should increase their training and education related to disaster management. the findings of this study suggest that training program on emergency and disaster care is very important to improve the knowledge of nurses.

F. Level of nursing skills on disaster preparedness

The total mean score of nurses preparedness of skills was 2.01 (SD 0.77) categorized as a moderate high level. It can be conclude that the skill of nurses for disaster management was still insufficient. Some factor that influenced moderate high level are working experience and training for disaster management.

The lowest means score of nurses preparedness accordance to skill was “sorting patient with psychological problems”. The impact of disaster not only physical impact but also psychology problem. Mental health or psychological problems may also be affected after disaster. The effects of a volcanic eruption on society may last far beyond the eruption itself.

G. Association between demographic data and nurses knowledge on disaster preparedness

The findings shows that there were statistically significant between educational background with nurses knowledge on disaster preparedness ($p=0.001 <0.05$). According to (Kak et al 2001 cited in Dewi, 2011) knowledge is defined as a recall of recognition of learned material which comes through processing a combination of understanding the facts and obtaining several ways of understanding, such as education, experience and so forth. The knowledge influences the skill as the combination of action and reaction that the individual performs according their previous understanding of the facts and as the function of both knowledge and strategies to apply such knowledge.

Therefore, knowledge and skills come together and intersect each aspect which could be explained as one combination of competency. According to the results of the study the positive association between education and knowledge on disaster preparedness can be explain due to more than half of nurses had an educational background at the diploma level was 52%, only 8.8% nurses had high educational background as master level. It means that the majority of nurses in this study had limited level of education.

In Indonesia diploma level is the low level in nurse education. Some factors including subjects’ working area, working experience, disaster experience, nursing education, and training and education were contributed to the knowledge of nurses.

It was found that there were associations between experiences in caring patient with knowledge on disaster management (p -value 0.02). According to Chapman (2008), stated that experience in disaster training and having a direct experience of a disaster may also help to upgrade the knowledge and confidence of the nurses to respond to disasters.

The level of nurses preparedness of knowledge was at moderate level as well as the nurses preparedness of skills means that the nurses were less prepare for their knowledge. Interestingly, nurses who had no experience in caring patient with disaster is (52.9). It means that nurses who had experience in disaster has lack significantly affect on their knowledge regarding to disaster preparedness.

H. Association between demographic data and nurses attitude on disaster preparedness

It was found that there were association between educational background with attitude of nurses for disaster management were p -value (<0.01). It can be explain that if nurses had higher educational level they would have better attitude toward disaster preparedness. In line with Fatma (2014) stated that the adequacy of knowledge and practice, and portraying positive attitude was driven by being involved in disaster response and attending disaster-related education. Supported study by Sharma et al (2016), found that hospital staff including nurses, in general, was found to be sensitive toward disaster management, but their level of awareness regarding the same was low. Nurses were found to be significantly more informed than other staff whereas doctors were found to have the most positive attitude toward disaster management. Low knowledge regarding disaster management among hospital staff, as shown in this study, can have catastrophic consequences.

In this study also found that there are association between experience in caring patient with disaster and attitude of nurses (p -value 0.00). In line with Nasrabadi (2007) reported that nurses who had previous experience regarding to disaster preparedness they will be more confidence and had good attitude than nurses who had no previous experience in caring patient with disaster.

I. Association between demographic data and nurses skills on disaster preparedness

In this study found that there are association between working experience and skill of nurses on disaster preparedness p -value <0.01 . According to Stanly (2005) explained that nurse who had experienced are better prepared than nurses with little experience in term of skills. Experience is considered as the basis of preparedness for core competences.

In this study the majority of nurses had working experience 5-10 years (48.5%) were 23.5% of nurses had moderate level of skill regarding to disaster preparedness and

only 14.0% nurses had high level of skill on disaster preparedness. However, nurses who had working in the hospital >10 years (26.5%) were one-third of nurses had high level of skill on disaster preparedness. This finding confirmed that if nurse has a time of working experience in hospital they will have high level of skill on disaster preparedness.

In this study found that there were association between training and skill of nurses on disaster preparedness (p -value <0.02). According to Chapman and Arbon (2008) explained that the training or education for disaster preparedness include Basic First Life Support, Triage, Health Assessment, Counseling, Communication Training, and Decontamination Training that are very important for hospital staff in caring casualty victims. They also showed that nurses who received training or education related to disaster preparedness have positive results such as increased self-confidence and get a better understanding of their role in disaster response.

In summary, the findings showed that there were some factors, including clinical experience, working experience, training and education were found to have association with nurses' perceived preparedness of knowledge, attitude and skills.

VI. RECOMMENDATION

These results due to the nurses had less continuity in attending training and education related to disaster preparedness and the majority of nurses had diploma level. A Training and education program is important for nurses who work in hospital or Puskesmas. The finding also showed that the participants had lowest mean score knowledge on identifying risk and suitable action to prevent disaster, its mean that nurses need to improve their knowledge and increase their training to prevent disaster.

VII. LIMITATIONS

The study was conducted among the nurses with only measured nurses preparedness in accordance to knowledge, attitude and skill regarding management disaster without which mean that this study cannot be generalized to other hospital staff nurses related to their preparedness.

VIII. CONCLUSION

This study highlights limitation of nurses preparedness in accordance to knowledge, attitude and skills. There are association between related factors and disaster preparedness. Nurses play vital role in health care systems throughout in the world. They should fully prepare on disaster management.

IX. ACKNOWLEDGMENT

This research project was funded by Khon Kaen University and School of Health Science Muhammadiyah Pringsewu. The authors would like to thank all Registered nurses who participated in the

study, and directors of Hospitals and Primary care unit in which the study was conducted, for facilitating data collection. Gratitude also to the experts who had given their valuable comments and suggestion during the instruments development.

REFERENCE

- [1] Arbon P, Bobrowski C, Zeitz K, Hooper C, Williams J, Thitchener J. Australian nurses volunteering for the Sumatra—Andaman earthquake and tsunami of 2004: a review of experience and analysis of data collected by the Tsunami Volunteer
- [2] Asian Development Bank, Japan Bank. Sri Lanka 2005 Post-tsunami recovery program preliminary damage and needs assessment, Annex 5, 2005
- [3] Chapman, K., & Arbon, P. Are nurses ready?: Disaster preparedness in the acute setting. *Australasian Emergency Nursing Journal*, 11, 135-144.
- [4] Chan, M. F. (2009). Factors affecting knowledge, attitudes, and skills levels for nursing staff toward the clinical management system in Hong Kong. *Computers Informatics Nursing* 27(1) 2008, pp 57-65.
- [5] Dewi Hermawati. Nurses' Perceived Preparedness of Knowledge and Skills in Caring for Patients Attacked by Tsunami in Banda Aceh, Indonesia and Its Related Factors. Thesis 2010
- [6] Fatma Abdelalim Abdelghany Ibrahim. Nurses Knowledge, Attitudes, Practices and Familiarity Regarding Disaster and Emergency Preparedness – Saudi Arabia. *American Journal of Nursing Science*. Vol. 3, No. 2, 2014, pp. 18-25. doi: 10.11648/j.ajns.20140302.12
- [7] Fung OWM, Loke AY, & Lai CKY. Disaster preparedness among Hong Kong nurses. *Journal of Advanced Nursing*, 62(6) 2008, 698–703 6p.
- [8] Hantoro, Wahyoe, S, et al.: *Tsunami Volkanik Krakatau “Studi Kronologi dan Upaya Mitigasi di Selat Sunda”*. Laporan Penelitian. Bandung. Puslit Geoteknologi –LIPI. 2006
- [9] Husna, C., & Hermawati, D. Nurses' Clinical Experience Questionnaire (NCEQ). Prince of Songkla University, Thailand. Thesis, 2009
- [10] Khalaileh, 2011 Jordanian nurses' perceptions of their preparedness for disaster management.
- [11] Klyman, Y., Kouppari, N., & Mukhier, M. World disasters report 2007: Focus on discrimination.

Geneva: International Federation of Red Cross and Red Crescent Societies, 2007

- [12] Leodoro J. et al. Disaster Preparedness in Philippine Nurses. *Journal of Nursing*. 2015.
- [13] Nasrabadi, A., Naji., Mizabei, G., & Dadbakhs, M. Earthquake relief: Iranian Nurses' responses in Bam, 2003 and Lesson learned. *International Nursing Review*, 59 (1) 2007., pp 13-18.
- [14] Rogers, B., & Lawhorn, E. (2007). Disaster preparedness: Occupational and environmental health professionals' response to hurricane Katrina and Rita. *American Association of Occupational Health Nurse Journal*, 55, 197-207.
- [15] Rowney, R., & Barton, G. X. The role of public health nursing in emergency preparedness and response. *Nursing Clinics of North America*, 40, 2007. pp 499-509.
- [16] Stanley, J. educational competencies for registered nurses responding to mass casualty incidents. Nashville :International nursing coalition for mass casualty education, 2003.
- [17] Veenema, T. G. Disaster nursing and emergency preparedness, 2007.
- [18] WHO, Risk Reduction and Emergency Preparedness : WHO six-years strategy for the health sector and community capacity development, 2007. Available from world health organization. Retrieved december, 20 2017 available from http://www.who.int/hac/techguidance/praparedness/emergency-preparedness_eng.pdf
- [19] Wisniewski, R., Dennik-Champion, G., & Peltier, J. W. Emergency preparedness competencies: Assessing nurses' educational needs *Journal of Nursing Administration*, 34, 2004, pp 475-480.
- [20] Winchester, Simon. Krakatoa : the day the world exploded, 27 August 1883 New York: Harper Collins Publishers, 2003.

The Effectiveness of Breathing Relaxation with Ballon Blowing Technique toward Physiological Changes of COPD Patients

¹Tunik, ²Elsye Maria Rosa, ³Azizah Khoiriyati

¹Master of Nursing Program, Universitas Muhammadiyah Yogyakarta

²Master of Hospital Administration, Universitas Muhammadiyah Yogyakarta

³Master of Nursing, Universitas Muhammadiyah Yogyakarta

E-mail: azizakhairiyati@yahoo.com

ABSTRACT

In Indonesia, COPD ranked as the 5th highest burden of disease. Physiology is one of the problems which statistically experienced by the patients of COPD and decrease their quality of life. COPD patients' quality of life could be increased with nonpharmacological therapy such as breathing relaxation. Breathing Relaxation with balloon-blowing technique is one the best breathing exercises to regain the function of lungs. The objective of this thesis was to measure the effectiveness of breathing relaxation with balloon-blowing technique toward physiological changes of COPD patients by measuring blood pressure, pulse frequency, and respiration rate. The research design used in this thesis was quasi-experimental with pre post design. The sample of the thesis was thirty-six (36) respondents of COPD patients of Flamboyan room in dr. Soedomo hospital. The sampling technique used in this research was consecutive-sampling technique. It was consisted of a group of intervention. The intervention was breathing relaxation which is blowing balloon twice per day with each session consisted of 3 sets of balloon blowing exercise. In each set, patients were asked to blow the balloon 3 times until the balloon was inflated and followed by 1 minute rest before continuing to the next set. Pre-test and post-test were used to collect the data of the research on the third and seventh day. The result were tested using Repeated ANOVA test. The result of statistical analysis showed the p value < 0.05 at the pulse and respiration rate on the third day, and p value <0.05 at all variables on the seventh day. This shows that balloon blowing intervention produced significant positive changes in physiological variables after 7 days of intervention. Relaxation technique by blowing a balloon could help intercostal muscle to elevate diaphragm and rib cage. Physiological respons (blood pressure, pulse rate, and respiratory rate) have changed significantly with balloon blowing for 7 days. Therefore, for future studies need to be conducted with control group, measuring the balloon resistance accurately.

Keywords: Balloon-blowing technique, Anxiety, COPD

I. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a disease characterized by a limitation of airflow which cannot be fully recovered, progressive, and is associated with abnormal response of pulmonary inflammation to harmful particles or gases that cause respiratory tract narrowing, mucous hypersecretion, and changes in the pulmonary vascular system (Brunner & Suddarth [2]). COPD patient will experience significant pulmonary function disturbance because of the inflammation and pulmonary structural resulting in weakness, decreased immunity, imbalances in the body, short breath, and hypoxemia. Patients also show psychosocial problems such as depression and anxiety, leading to decreased quality of life (Causey, R [3]; Vestbo, J et al. [15]).

The main cause of COPD is tobacco-smoking and others supporting factors such as genetic, lung development, and environmental factors (Decramer, M. [6]). Other factors that cause COPD are pollution exposure, chemical exposure, wood, animal waste-based fertilizer, coal, burning processes, electric stoves. Evidence shows that pollutant from biomass used in cooking and sewing is a significant risk factor for chronic pulmonary problems (Vestbo, J et al, [15]).

Clinically, COPD patient would experience depression and have at least two-fold risk for anxiety disorders. Anxiety in COPD patient is associated with increased risk of exacerbations, worsening health status related to patients' quality of life, and deterioration of patient's condition that needs hospitalization (Volvato et al. [16]). Other problems experienced by COPD patient are unstable emotion, inadequate coping strategy, feeling helpless, feeling powerless, feeling restricted, social isolation, and difficulty to socialize with other people (Volvato et al, [16]). The prevalence of anxiety among COPD patients is 10-50%, while the prevalence of depression reached 12-50%; one out of three COPD patient will experience anxiety disorders (Cleland, J A., [4]).

In 2020, WHO estimated that the mortality rate caused by COPD will be one of the biggest health issues and will cause 8.4 million people to die per year. In Indonesia, COPD ranked as the 5th highest burden of disease. From preliminary studies done in RSU dr. Soedomo Trenggalek, it could be seen that Flamboyan room (room for pulmonary disease) treated on average 120-160 COPD patients per year. Interview from 2 patients obtained the information that both are active smoker, have breathing difficulty, and productive cough.

Those symptoms will lead to physiological changes in COPD patient.

COPD patients' quality of life could be increased with nonpharmacological therapy such as breathing exercise, breathing relaxation atau deep breathing (Bilo et al, [1]; Volvato et al, [16]). Breathing relaxation could improve lung functions and acts as a psychological therapy to reduce depression and anxiety. (Volvato et al, [16]). Smeltzer & Bare (2002) noted that the purpose of breathing relaxation is to increase alveolar ventilation, maintain gas exchange, prevent pulmonary atelectasis, increase cough efficiency, reduces both physical and emotional stress by decreasing pain and anxiety. Breathing exercise consists of many techniques, one of them is balloon blowing. Relaxation technique by blowing a balloon could help intercostal muscle to elevate diaphragm and rib cage. It could increase oxygen absorption, exchange substances that remain in the lungs and force carbon dioxide out of the lungs. Balloon blowing is very effective to help lungs expansion so it could supply more oxygen and release carbondioxide trapped in the lungs of COPD patients. Many researches about the effect of balloon blowing to smoker conclude that blowing balloon routinely could improve pulmonary function by increasing peak expiration flow in a smoker with respiratory disturbance (Kim, J.S. [9]; Raju S., [12]).

Based on explanation above, a research is needed to understand the effect of breathing relaxation using balloon blowing technique towards physiological changes that include blood pressure, pulse frequency, and respiration frequency in COPD patients in RSUD Dr. Soedomo Trenggalek.

II. METHODS

This research is a quasi-experimental study using pre-post test design. The population in this research is COPD patients treated in the Flamboyan room of RSUD dr. Soedomo Trenggalek that was chosen by consecutive sampling method. The intervention was breathing relaxation which is blowing balloon twice per day in the morning and evening, with each section consisted of 3 sets of balloon blowing exercise. In each set, patients were asked to blow the balloon 3 times until the balloon was inflated and followed by 1 minute rest before continuing to the next set. Before blowing the balloon, patients took a deep breath for 3-4 seconds, hold it for 2-3 seconds and then blew the balloon for 5-8 seconds. This intervention was done for 1 week. The instruments used are fingertip oxymetry to measure pulse rate, sphygmomanometer to measure blood pressure and a

watch to measure respiratory rate. The data was taken before and after the intervention in the third day and seventh day. The data collected was then tested for normality with Shapiro-Wilk, and the result was normal distribution for all variables. Afterwards, the data was analysed using repeated-measured ANOVA statistic test

III. RESULT

A. Univariate analysis of maximum blood pressure, pulse frequency, respiration frequency, before and after intervention for 3 days and 7 days

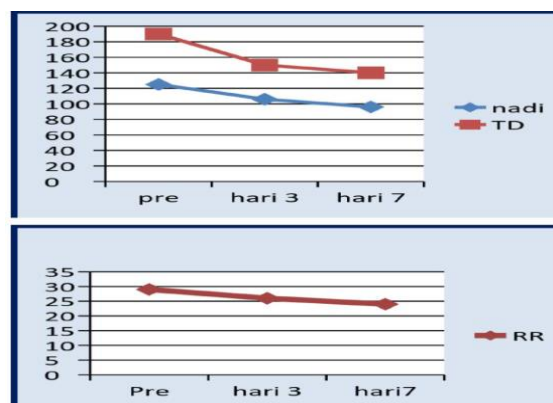


Figure 1 and 2 is the maximum blood pressure, pulse frequency, and respiration frequency before and after balloon blowing intervention in the third and seventh day.

From figure 1 and 2, it could be seen that there was physiological changes. The systolic blood pressure before intervention was 190 mmHg, but after 3 days of intervention, the patient's maximum systolic blood pressure was 150 mmHg, and after 7 days became 140 mmHg. Maximum pulse frequency before breathing relaxation was 125 x/minutes, but after 3 days of intervention, the maximum pulse rate decreased to 106 x/minutes, and after 7 days became 96 x/minutes. Respondents' maximum respiratory rate before intervention was 29 x/minutes and after 3 days of intervention, the maximum respiratory rate was 26 x/minutes, and after 7 days was further reduced to 23x/minutes.

B. Univariate analysis of physiological changes (blood pressure, pulse rate, and respiratory rate), before and after intervention for 3 and 7 days.

Table 1. Means of physiological changes (blood pressure, pulse rate, and respiratory rate), before and after intervention in COPD patients in RSUD Dr. Soedomo Trenggalek

| Physiological Change | Pre | | Post day 3 | | Post day 7 | |
|----------------------|--------------|---------------|--------------|---------------|-------------|---------------|
| | mean±SD | 95 % CI | mean±SD | 95 % CI | mean±SD | 95 % CI |
| BP | 134,0 ± 19,2 | 127,5 - 140,0 | 129,2 ± 10,8 | 125,5 - 132,8 | 124,3 ± 7,9 | 121,5 - 126,7 |
| Pulse rate | 91,3 ± 12,3 | 87,1 - 95,5 | 84,6 ± 7,7 | 81,9 - 87,2 | 81,1 ± 5,6 | 79,2 - 83,1 |
| Respiratory Rate | 25,8 ± 1,8 | 25,2 - 26,4 | 22,4 ± 1,8 | 21,8 - 22,9 | 21,5 ± 1,4 | 21,0 - 21,9 |

Source: primary data 2016-2017

The result on Table 1 shows that the mean of respondent's blood pressure before intervention was 134 mmHg, after 3 days of intervention it was reduced to 129.2 mmHg and after 7 days of intervention it was reduced to 124.3 mmHg. The average pulse rate before intervention was 91.3, after 3 days of intervention it was reduced to 84.6 and after 7 days of intervention it was reduced to 81.1 mmHg. The average respiratory rate before intervention was 25.8, after 3 days of intervention it was reduced to 22.4 and after 7 days of intervention it was reduced to 21.5.

C. Bivariate analysis of the influence of balloon blowing intervention to physiological changes (blood pressure, pulse rate, and respiratory rate) of the respondents after intervention on day 3 and day 7

The explanation below is the result of analysis using repeated-measured ANOVA test to anxiety (blood pressure, pulse frequency, and respiration frequency) after intervention with balloon blowing for 3 days and 7 days.

Table 2. The influence intervention to physiological changes (blood pressure, pulse rate, and respiratory rate) after breathing relaxation with balloon blowing technique for 3 days and 7 days on COPD patients in RSUD Dr. Soedomo Trenggalek

| Anxiety | Time | | | | | |
|------------|----------------|--------|----------------|--------|----------------|--------|
| | Day 1 to Day 3 | | Day 1 to Day 7 | | Day 3 to Day 7 | |
| | Mean ± SD | Pvalue | Mean ± SD | Pvalue | Mean ± SD | Pvalue |
| BP | 134,0 ± 19,2 | 0,168 | 129,2 ± 10,8 | 0,003 | 124,3 ± 7,9 | 0,006 |
| Pulse rate | 91,3 ± 12,3 | 0,002 | 84,6 ± 7,7 | 0,000 | 81,1 ± 5,6 | 0,048 |
| Respirator | 25,8 ± 1,8 | 0,000 | 22,4 ± 1,8 | 0,000 | 21,5 ± 1,4 | 0,000 |

Source: Primary Data 2016-2017

From Table 2, it could be seen that almost all changes were significant ($p < 0,05$). Therefore there was

significant differences between the parameters of physiological changes (blood pressure, pulse rate, and respiratory rate) in the patients before and after intervention with breathing relaxation using balloon blowing technique in RSUD dr. Soedomo Trenggalek. In the result, there were only one insignificant result ($p > 0,05$), that is the blood pressure measurement at the first 3 days. However, after day 7, there was a significant change, with a p value of $< 0,05$. This result shows that there was a significant impact from the intervention towards physiological changes variables (blood pressure, pulse rate, and respiratory rate).

IV. DISCUSSION

The result shows that there were significant physiological changes among COPD patient before and after intervention with breathing relaxation using balloon blowing technique for 7 days. The statistical analysis showed that *p value* reached $< 0,05$ in almost every variables of physiological changes which consist of blood pressure, pulse rate, and respiratory rate.

Non-pharmacologic intervention/non-drug treatment is a main therapy for patients with chronic anxiety and depression who need an effective intervention to decrease the physiological response in COPD patients. One of the psychological interventions that used in the study was breathing exercise/breathing relaxation. Breathing relaxation based was found to reduce physiological response in COPD patients, hence improving patient's health status and quality of life.

Valenza et al. [14] did a study on the management of COPD patients with exacerbation and post-exacerbation; the aim of the research was to decrease or control anxiety and depression in patients with COPD exacerbation and treated in the hospital. The variables used by researcher were degree of shortness of breath, anxiety, depression and quality of life of the patients. The intervention done was controlled breathing program consisting of relaxation exercise, pursed lips breathing, active respiration. Relaxation exercise was done to decrease respiratory rate and increase tidal volume and hence the respiration function. Pursed lips breathing was done to improve expiration by increasing expiration phase and prevent constriction of airway during expiration. Pursed lip breathing could reduce respiratory rate, shortness of breath, PaCO and improve tidal volume and oxygen saturation at rest. The markers observed were increasing tidal volume and decreasing respiratory rate. Active expiration increases the elasticity of diaphragm pressure and rib cage, where after the expiration muscles are relaxed, it is ready for the next

inspiration process. Improvement in patient's respiration function was expected to resolve patients' physiological problem. The study concluded that respiration control exercise could improve physiological response in patients with COPD exacerbation that was hospitalized.

Conventry, P. [5] did a systematic review to analyze the influence of several interventions towards anxiety and depression in COPD patients. From the researches reviewed, the intervention that could reduce anxiety and depression in COPD patient is relaxation (progressive muscle relaxation). The result obtained was reduced anxiety and depression level which was measured with several tools for anxiety such as HADS, STAI, SCL-Anxiety, BAI, SCL and N/A.

Causey, R [3] in his research mentioned that COPD patient must do a respiration exercise with pursed lips breathing (PLB), diaphragmatic breathing and coughing technique to improve their physical condition. PLB has been proven to decrease lung hyperinflation in COPD patients and increase oxygen uptake. This technique has also been proven to reduce respiratory rate and anxiety in COPD patients. Causey's qualitative research obtained an information from the respondent that after breathing exercise, patient's anxiety were decreased, followed by decreased respiratory rate, decreased frequency of micturition, and improvement in nutrition status.

Anxiety causes psychological and physiological changes in the patient. Physiological response that usually accompanies anxiety are increased blood pressure, increased pulse rate, palpitation, increased respiratory rate, dry lips, muscle tension and diarrhea. These responses emerge due to activation of autonomic nervous system and arteriolar vasoconstriction. These responses started with stress, which provoke anxiety which then activate the central nerve system – hypothalamus activation – pituitary glands – adrenal axis and sympathetic nerves that respond by increasing blood pressure, increasing pulse rate, and respiratory rate.

This research shows that there were significant physiological changes after 7 days of intervention which could be seen from the change in blood pressure, pulse rate and respiratory rate after day 7. Breathing relaxation for 3 days did not produce significant changes in physiological response, especially in blood pressure (only significant in pulse rate and respiratory rate). Puspita [11] explained that there are several factors causing anxiety among patients during hospitalization, such as physical condition, environment, limitations and individual's coping mechanism. Physical condition of the patients is related to the disease and symptoms of the

patients. Environment is related to the physical environment of the hospital, the behavior of the nurse and hospital staff, and social environment between patients. Anxiety occurs because of limitation in such as limited activities, social limitations (separated from family), and economic limitations. The insignificant change in blood pressure may be caused by ongoing anxiety caused by several factors mentioned above; this is because in the day 3 of intervention, several respondents were still hospitalized, while in day 7 some respondents had been discharged.

Breathing exercise, breathing relaxation or any relaxation intervention is one of the independent actions of nurses. The interventions are available in nursing intervention classification book, which is nurse's guidance in providing nursing care and intervention to the patient. The interventions could be catered to patients with nursing problems such as discomfort and pain, respiratory problem (breathing pattern, and respiratory tract's discharge) and also used for anxiety management. The interventions were also used by many researchers in the nursing field as an independent act to solve patient's problem, especially in patients with cardiovascular system and respiration system problems.

Clinical value of the physiological variables measured, such as blood pressure, pulse rate and respiratory rate in COPD patient have changed after intervention. PDPI [10] mentioned that COPD patient would have a blood pressure in mild hypertension range (systolic pressure 140-159 mmHg) to severe hypertension (systolic pressure 160-179 mmHg). The pulse frequency of the COPD patients was 60-100 x/minutes and the respiratory rate was 16-25 x/minutes. The guidebook mentioned that COPD patients with respiratory rate >25 must be treated with oxygen therapy. The research shows that maximum systolic pressure reached 190 (severe hypertension), pulse rate 125 x/minutes (tachycardia) and respiratory rate 29 x/minutes. After 7 days of intervention, blood pressure, pulse rate, and respiratory rate decreased to the normal range for COPD patients where blood pressure is in mild hypertension (140 mmHg), pulse rate is in normal range (96 x/minute) and respiratory rate is in the normal range (24 x/minute). This shows that balloon blowing intervention produced significant positive changes in physiological variables after 7 days of intervention.

V. CONCLUSION

1. The mean blood pressure, pulse rate, and respiratory rate of COPD patient before intervention were

abnormal; all three of them were above the normal range.

2. Pulse rate and respiratory rate of COPD patient decreased significantly, from the value before intervention, after 3 days of intervention with balloon blowing. Blood pressure did not change significantly after 3 days of intervention.
3. Physiological response measured, blood pressure, pulse rate, and respiratory rate have changed significantly from before and after intervention with balloon blowing for 7 days.
4. Breathing relaxation with balloon blowing technique caused significant physiological changes, measured from the blood pressure, pulse rate and respiratory rate of COPD patients in Flamboyan room of RSUD Dr. Soedomo Trenggalek, East Java.

VI. SUGGESTION

This study had several limitations. First, the subjects were limited to 36 respondents of COPD patient in a group of intervention. Second, the relative resistance of the balloons was not constant because of individual differences. Therefore, for future studies need to be conducted with control group, measuring the balloon resistance accurately.

REFERENCES

- [1] Bilo *et al.*, (2012). Effects of Slow Deep Breathing at High Altitude on Oxygen Saturation, Pulmonary and Systemic Hemodynamics. *PLoS ONE* 7(11): e49074. doi:10.1371/journal.pone.0049074
- [2] Brunner & Suddarth. (2013). *Keperawatan medikal-bedah Brunner & suddarth*. Alih bahasa. Jakarta : EGC
- [3] Causey, R. (2013). Breathing Easier : Pulmonary rehabilitation in skilled nursing facilities. *Eastern Kentucky University*. [http : //dx.doi.org/10.7138/otp.2013.1821f2](http://dx.doi.org/10.7138/otp.2013.1821f2).di akses tanggal 19 Januari 2016
- [4] Cleland, J A. (2007). Associations of depression and anxiety with gender, age, health-related quality of life and symptoms in primary care COPD patients. Departement of General and Primary Care, Universitas of Aberdeen, foresterhill Health Centre, Wesburn Road Aberdeen.AB25 2A,UK.
- [5] Coventry, P A. (2013). The Effect Of Complex Interventions On Depression And Anxiety In Chronic Obstructive Pulmonary Disease : Systematic Review And Meta Analysis. *Plos ONE* 8(4) : e60532. Doi : 10.1371/journal.pone.0060532.
- [6] Decramer, M. (2012). Chronic Obstructive Pulmonary Disease. *Lancet* 2012; 379: 1341-51. DOI: 10.1016/s0140-6736(11)60968-9
- [7] Domini, D. (2015). Effectiveness of breathing exercise in patients with chronic obstructive pulmonary disease. *Ind J resp Care* 2015;4:561-4
- [8] Jeremy P.T. *et al.* (2008). *At a Glance Sistem Respirasi*. Surabaya : Erlangga
- [9] Kim, J S. (2012). Effects Of Balloon-Blowing Exercise On Lung Function Of Young Adult Smokers. *J. Phys. Ther. Sci.* 24: 531-534
- [10] Perhimpunan Dokter Paru Indonesia (PDPI), (2011). *Penyakit Paru Obstruktif Kronik (PPOK) 1 Diagnosis & Penatalaksanaan*
- [11] Puspita, R N. (2014). Hubungan Kecemasan Terhadap Tingkat Kontrol Asma di Balai Besar Kesehatan Paru Masyarakat (Bbkpm) Surakarta. *PubMed. Eprint.ums.ac.id*. Diakses tanggal 1 juni 2016
- [12] Raju, S. (2013). Effectiveness Of Balloon Therapy Vs Incentive Spirometry On Physiological Parameters Among Children With Lower Respiratory Tract Infection In Selected Hospital, Bangalore. Padmashree Institute of Nursing, Kommaghata, Kengerihobli Bangalore-560060
- [13] Sugiyono. (2010). *Metode Penelitian Kuantitatif, Kualitatif dan RnD*. Bandung : Alfabeta
- [14] Valenza, M C *et al.* (2014). Effectiveness of Controlled Breathing Techniques on Anxiety and Depression in Hospitalized Patients With COPD : A Randomized Clinical Trial. *Respir Care* 2014;59(2):209 –215. © 2014 Daedalus Enterprises. DOI: 10.4187/respcare.02565
- [15] Vestbo, J. *et al.* (2013). Global strategi For The Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. *Am J Respir Crit Care Med* vol 187, Iss. 4, pp 347-365, feb 15, 2013
- [16] Volvato *et al.* (2015). Relaxation techniques for people with Chronic Obstructive Pulmonary Disease : A systematic Review and Meta Analysis. Artikel ID 628365, 22 pages 7 (11) : e49070

Cupping as Complementary Therapy for Patients with Hyperuricemia

¹Umi Hani, ²Rita Wadi W

¹Public and Community Health Nursing Science, Faculty of Nursing, Universitas Indonesia, Depok, Indonesia

²Division of CMHN, Department of Nursing Science, Faculty of Medicine, Universitas Diponegoro, Indonesia

Email: ¹umi.hani51@webmail.ui.ac.id/umi.hani.ners@gmail.com, ²ritahadi@fk.undip.ac.id

ABSTRACT

Hyperuricemia is the high level of uric acid in the blood that can create an abundant small crystal on tissue, especially on the joint. When this crystal was created in joint, it will cause a relapse pain and arthritis. The increase of uric acid usually followed by hypertension, hyperlipidemia, obesity, kidney failure, diabetic, and other metabolism disorder. The increase of uric acid also effects cognitive function through cerebrovascular system. Cupping, known as bekam or hijamah, has used as nonpharmacology therapy for many symptoms and diseases as abnormal blood component. The purpose of this study was to deeply identify the effect of cupping therapy on level of uric acid in the blood of patients with hyperuricemic. This study also aimed to describe changes in symptoms of the disease before and after cupping therapy. This is a case study where the data was collected using pretest and posttest without control and also using in-depth interview. The number of participants are 5 people. Wilcoxon Signed Ranks Test was used to test the effect of cupping therapy of the uric acid level. Researcher then interviewed respondents to find out their gout complaints they felt before and after treated by cupping therapy. The statistical test showed decreasing of uric acid level after cupping that is interpreted from the decreasing of its mean from 8,60 to 4,66. The analyze of Wilcoxon Signed Ranks Test showed the significant score ($p = 0.043$) that means cupping therapy can significantly reduce uric acid level in patients with hyperuricemic. All five respondents stated that symptoms of unbearable pain, swelling, and feeling of heat in the joints were no longer felt after treatment with cupping therapy. This study revealed that level of uric acid on patients with hyperuricemic can be reduced with cupping therapy. Hospitals are advised to recommend cupping therapy as complementary therapy for patient with hyperuricemic, although other factors (i.e. dietary management, medical treatment, exercise, other diseases, etc) should be considered. For further research, it is recommended to investigate the cupping therapy with better instrument and more samples.

Keywords: Hyperuricemia, Uric acid, Cupping therapy

I. INTRODUCTION

Uric acid disease is a term often used to refer to one type of articular rheumatic disease [1]. Study from Shamley [2] showed that 90% of uric acid is the result of purine catabolism aided by guanase enzymes and xanthine oxidase. The latest data from Rumah Sakit Umum Pusat Dr. Cipto Mangunkusumo (RSCM), Jakarta showed an increase of about 9 people from 1993 to 1994 and about 19 people from 1994 to 1995 [1]. In 2007, according to the data of patients treated at RSCM, patients with hyperuricemic are 7% of all patients suffering from rheumatic diseases. While the prevalence of hyperuricemia in the population in Central Java is 24.3% in males and 11.7% in females. In Bandung, Central Java, prevalence in the age group of 15-45 years was 0.8%; covering men 1.7% and women 0.05% [3].

Advanced hyperuricemia can develop into gout [4]. The prevalence of gout not only occurs in the United States but also in some developing countries, such as in Indonesia [5]. Hyperuricemic is classified as primary gout disease (90 %) and secondary gout disease (10 %). Primary gout is a case where the cause is unknown or due

to abnormalities of metabolic processes in the body. Secondary gout is the case where the cause can be known. Approximately 90% of primary gout patients are men who are generally older than 30 years, while gout in women generally occurs after menopause. It is estimated that gout occurs in 840 people every 100,000 people. Gout is strongly associated with obesity, hypertension, hyperlipidemia, and diabetes mellitus.

Management of gout is to stop pain in acute attacks, prevent recurrence, and prevent complications due to deposition of urate crystals in joints, kidneys, or other body parts. While in patients with asymptomatic hyperuricemia, it is not required pharmacological therapy. Reduction of hyperuricemia is needed to prevent the development of acute gout in patients at high risk. Dietary and lifestyle changes including weight loss, alcohol restriction, high purine diet, and hyperlipidemia and hypertension control can lower serum uric acid levels even without drug therapy. Decreased levels of uric acid in the blood can also be achieved with a variety of alternative treatments such as herbal remedies, acupuncture, and cupping. Today, the more frequent method of balancing the blood content is cupping [6,9].

Cupping therapy is a treatment with minor incision techniques using a knife or needle to remove dirty blood, blood poison, blood diseases contained in the body. The bloods cause blockage or constriction in the blood vessels. Cupping has been widely used for various diseases such as excessive menstrual bleeding, inflammation, hernia, sciatica, ulcers, hydrocele, gout, kidney disorders, epistaxis, etc. [7,10]. However, it is limited to find studies that explored what is felt by hyperuricemic patients who get cupping therapy. Therefore, this study is needed to assess the effect of cupping therapy on uric acid levels as well as to explore the symptoms felt by hyperuricemic patients who get cupping therapy.

II. METHOD

A. Design

This is a case study where the data was collected using pre and posttest without control and also using in-depth interview.

B. Participant

Participants are patient with hyperuricemic in Kecamatan Tembalang, Semarang, Central Java, Indonesia. Participants recruitment used purposive sampling. The number of participants are 5 people.

C. Procedure

Before interview, researcher gave cupping therapy to participants. I also checked participants' level of uric acid before first cupping therapy and after third cupping therapy. After three times of cupping therapy, researcher made an unstructured interview to explore the symptoms that participants felt.

D. Measures

Level of uric acid was measured by blood check tool, while the symptoms explored by in-depth interview. The uric acid level measured before first cupping therapy and after third cupping therapy. Wilcoxon Signed Ranks Test was used to test the effect of cupping therapy of the uric acid level. Researcher interviewed respondents to find out their gout complaints they felt before and after treated by cupping therapy.

E. Data analysis

The data of participants' uric acid was analyzed by pair sample t Test. While the results of the transcript interview are analyzed thematically by organizing categories, sub themes, and themes.

III. RESULT

A. Participants Characteristic

The participants were residents of Bulusan Village, Tembalang, Semarang, Central Java, who were recorded as hyperuricemia patients at Tembalang Public Health Centre. The five participants all women ranged 30-50 years old. Participants experienced hyperuricemia for a long time ranged 2-7 years.

B. Statistics

The uric acid levels in patients with hyperuricemia before and after cupping therapy presented in Table I.

Table 1. Table type styles

| Paired Samples Statistics | | | | | |
|---------------------------|------|--------|---|----------------|-----------------|
| | | Mean | N | Std. Deviation | Std. Error Mean |
| Pair 1 | Pre | 8.6000 | 5 | 2.69691 | 1.34846 |
| | Post | 4.7500 | 5 | .92916 | .46458 |

The difference in mean of uric acid before and after Cupping Therapy. The analyze of Wilcoxon Signed Ranks Test presented in table II.

Table 2. Wilcoxon signed ranks test

| Table Head | Test Statistics ^a |
|-----------------------|------------------------------|
| | Post-Pre |
| Z | -1,970 ^b |
| Asymp. Sig (2-tailed) | 0,049 |

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks

Test Statistics shows that Asymp.Sig (2-tailed) is 0,049. This is less than 0,05 means that there is different level of uric acid before and after cupping therapy.

C. Thematic Analysis

One theme created from the interview is less pain. All five participants stated that symptoms of unbearable pain, swelling, and feeling of heat in the joints were no longer felt after treatment with cupping therapy. Participants also stated their desire to obtain further cupping therapy. Participants did not feel pain even though the procedure cupping using sharp tools. Only two participants expressed little pain like an ant bite.

IV. DISCUSSION

Excessive uric acid creates small crystals that accumulate in the tissues of the body, especially in the joints. When these crystals form inside the joint it will cause repeated attacks on joint inflammation (arthritis) and the risk of gout disease [4]. A study conducted at Johns Hopkins University Hospital in 2007 showed that high levels of uric acid became one of the causes of

decline in cognitive, cardiovascular, and biological metabolism in older adults. Increased uric acid is usually accompanied by hypertension, hyperlipidemia, obesity, kidney failure, diabetes, and other metabolic disorders. Increased uric acid is thought to affect cognitive function through cerebrovascular changes. Levels of uric acid in cerebrospinal fluid are increased in dementia patients but decreased in Alzheimer's patients. Invalid source specified.

The effect of decreased uric acid levels by cupping therapy is thought to be influenced by changes in blood content of cupping. A study by Bilal, Khan, Ahmed, and Afroz of the Karachi University Faculty of Pharmacy, Pakistan [8] compared blood cupping and venous blood. The results showed that there was a decrease of white blood cells, red blood cells, hemoglobin, Hb concentration, platelets, and monocytes in cupping blood compared with venous blood.

The first purpose of this study was to determine uric acid levels in patients with hyperuricemia before cupping therapy. In 2007, according to patient data treated at RSCM clinic, uric acid sufferers about 7% of all patients suffering from rheumatic disease [3]. The prevalence of hyperuricemia in the population in Central Java was 24.3% in males and 11.7% in females. In Bandung, Central Java, prevalence in the age group of 15-45 years was 0.8%; Covering men 1.7% and women 0.05%.

This study showed the mean of uric acid level before cupping therapy was 8.60 and could be categorized as moderate hyperuricemia based on categorized according to normalized hyperuricemia, mild hyperuricemia, moderate hyperuricemia, severe hyperuricemia and high severe hyperuricemia. And for the results, data showed that there was a decrease in mean of uric acid levels in hyperuricemic patients one hour after cupping therapy. The result 4.75 interpreted as normal uric acid levels. This study also identify changes in uric acid levels in patients with hyperuricemia before and after cupping. The result of statistical analysis shows mean difference (average) of uric acid level before and after cupping with Asympt.Sig (2-tailed) or p value is 0,049. Value p less than 0,05 means that there is a significant change of the measurement results of uric acid levels in patients with hyperuricemia.

From thematic analysis, this study revealed that patients with hyperuricemia felt less pain due to cupping therapy for three times.

V. CONCLUSION

This study revealed that level of uric acid on patients with hyperuricemic can be reduced with cupping therapy. Hospitals are advised to recommend cupping therapy as complementary therapy for patient with hyperuricemic, although other factors (i.e. dietary management, medical

treatment, exercise, other diseases, etc) should be considered.

ACKNOWLEDGMENT

Thanks to Tembalang Public Health Centre, Universitas Diponegoro, Universitas Indonesia. The author also wish to thank to Indonesia Endowment Fund for Education (LPDP) for the support.

REFERENCES

- [1] Utami, Prapti, dr. dan Tim Lentera, Tanaman Obat untuk Mengatasi Rematik dan Asam Urat, Jakarta: AgroMedia Pustaka, 2003
- [2] Shamley. D., 2005, Pathophysiology an Essential Text for the Allied Health Professions, Elsevier Limited, USA.
- [3] Anonim. 2010. Data Pasien Asam Urat di RSCM (on line), (<http://www.depkes.go.id>).
- [4] Klippel JH, Dieppe PA, Ferri FF (2000) Primary care rheumatology, Harcourt, London
- [5] Walker, R., and Edwarda, C., 2003, Clinical Pharmacy and Therapeutics, 3rd ED., Churchill Livingstone, London
- [6] Soemasto S.A., et al., 2000. Kapita Selekt Kedokteran, editor Mansjoer Arif et al., edisi 2. Jakarta: Media Aesculapius
- [7] Shixi, Huang; Yu, Cao; Michalsen A. 2006. Cupping Therapy. Journal of Chinese Medicine Issue 82, p52-57. 6p
- [8] Bilal M, Khan RA, Ahmed A and Afroz S (2011). Partial evaluation of technique used in cupping therapy. J. Basic Appl. Sci., 7: 65-68
- [9] Ullah K; Younis, A; Wali, M. 2007. An investigation into the effect of Cupping Therapy as a treatment for Anterior Knee Pain and its potential role in Health Promotion. . The Internet Journal of Alternative Medicine Volume 4 Number 1
- [10] Michalsen A, dkk. 2009. Effects of Traditional cupping Therapy in Patients With Carpal Tunnel Syndrome: A Randomized Controlled Trial. Volume 10, Issue 6, Pages 601-608
- [11] Bunner dan Suddarth.(1996). Keperawatan Medikal Bedah: Buku Saku, Jakarta: EGC
- [12] Gaylene dan Patricia, C.(2000). Fundamental and Advanced Nursing Skill, Canada: Thomson Learning
- [13] Grace, Pierce dan Borley, Nell.(2007). At a Glance Ilmu Bedah edisi ke tiga, Jakarta: Erlangga

A Study on Relationship among Health Status and Media Literacy among Elderly in Surin Province

¹Wareewan Wiriwanij, PhD, RN, ²Chularat Howharn, PhD, RN, ³Woranart Promsuan, MS, RN, ⁴Suparanich Wasukanchanavej, MS, RN

^{1,2,3,4}Boromarajonnai College of Nursing, Surin, Surin Province, Thailand

Email: ¹wareewan@hotmail.com, ²howharn@gmail.com, ³woranart_pro@hotmail.com, ⁴suparanich@gmail.com

ABSTRACT

Among this world of communications technology, medial literacy emerges as a necessity for effective filtering of the vast of information we consume. The aims of this descriptive study were to determine health status and media literacy and a relationship between health status and media literacy among elderly in Bakdi Subdistrict, Muang Surin. Sample were purposive samplings from elderly age more than 60 years old who living in Bakdi Subdistrict, Muang Surin which were simple random from lists of subdistrict of Surin province. There were 204 elderly with years of age were 61-80 ($M = 68.28$, $SD. = 4.93$) completed structured questionnaires. Descriptive statistics were utilized to describe the findings. The findings were as followed. Majority of samplings were female (60.8%), never attended school (83.8%), married (50.5%), stay with descendants (58.3%), they have income from premium of elderly only (89.7%), their descendants were caregivers (70.6%), and have chronic disease such as hypertension or diabetes mellitus (71.6%). However, elderly with disease rated their status not statistically difference than elderly without chronic disease ($M = 7.36$, $SD. = .48$; $M = 7.40$, $SD. = .49$, $p=.64$ respectively). All of them never used social media such as email, line, facebook, etc. There was only 16.7% ever computers at Elderly club for entertainments. Moreover, it was very little number of elderly who search for information about treatment, health care providers, and peer health group (2.9%, 4.9%, and 4.9%, respectively). They also rated media literacy at low score. They also have very low self-efficacy score on media literacy. They stated that they chose health care providers first if they want to have more health information. There was no statically significant relationship among health status and media literacy. The suggestions from this study are that any activities lunched in Elderly club should be integrated the promoting of media literacy. However, how to promote media literacy who never attends school is very challenging job for health care providers. Therefore, research and development for develop program enhancing media literacy among elderly should be conducted.

Keywords: *Eldery, Media lieracy, Health status, Surin*

I. INTRODUCTION

Like other country, Thailand now facing with aging society in which faster than expectations. Priori, the proportion of Thai elderly aged 60 and over is expected to increase from 10.5 percent in the year 2005 to 30 percent by 2050 (National Statistical Office [2]); currently, in the next five years, one-third of Thai population will be aging who age more than 60 years old. Significantly, twenty percent of this group will be dependent group. Among the world of communications technology, media literacy emerges as a necessity for effective filtering of the vast of information we consume. Around 50% of older population relies on television as their main form of company and it clearly plays an important role in the lives of many older people (The European Older People's Platform [1]). However, older people are not in the main making the most of the potential of new technology. Thus, medial literacy will foster their self-care then can affect in decreasing the level of dependency.

Surin province is a province that shares the border line with Cambodia. Based on their descendant people living in Surin can categorize into three groups which are Thai-Khmer, Thai-Laotian, and Kui. They have some level of different on their health practice. The majority of people live in Bakdi Subdistrict, Muang Surin which is not far from downtown of Surin province is Thai-Khmer. They are still practice their ways of life as their ancestor practices. From the observation their rarely used of modern way of life. Thus, it is very significant to study their health status, media literacy, and the relationship between health status and media literacy. Findings will be useful for initiate any health intervention integrating with media that can expand their period of good health status and quality of life.

This study is a part of a research and development for the develop of health care model in enhancing the health status of elderly in Surin province.

II. METHODOLOGY

A. Study design

This was a descriptive study aims for determine health status and media literacy and a relationship between health status and media literacy among elderly in Bakdi Subdistrict, Muang Surin.

B. Population and samples

Population were elderly who living in Bakdi Subdistrict, Muang Surin which far from downtown of Surin province about 15 minutes.

G*power was used to determine the sample size, effect size was set at medium, power was set as .80, and α was set at .05. There was 194 cases was need; and 10 cases were added since samples were elderly which may be some items they could not answer.

Samples were purposive samplings from elderly age more than 60 years old who living in Bakdi Subdistrict, Muang Surin which were simple random from lists of subdistrict of Surin province.

C. Questionnaires

There were five structured interview questionnaires used to collect the data.

General information sheet composed of 9 items were used to collect information about sex, education level, marital status, house, income, source of income, age, caregiver, and history of chronic disease.

Health status sheet composed of 10 items was used to rate the health status in which samples rated their health status from 10 (good/healthy/very satisfied) to 0 (bad/poor/very not satisfied).

Behaviors about media consume composed of 4 items was used to gain information about media consuming. Samples were asked to rate the frequency about media consume on email, Line, Instagram, SocialCam, Twitter, Facebook, Blogs, Pantip or Dekdee, searching, entertainment, Games, or other media. Moreover, samples were asked to rate their frequency about the times that they used for searching about health information, entertainment, and communication; also, they have to rate about the devices that they used for media searching.

Media literacy scale was used to determine the score of medial literacy. This scale composed of 8 items.

Self-efficacy on media literacy scales was used to determine their perception on medial literacy. This scale composed of 6 items.

All five questionnaires were sent to five experts for construct validity. The revision version which revised based on the experts was used to determine the

reliability with 30 elderly who were living in nearest subdistrict. Overall, psycho-properties of questionnaire were at good level.

D. Data Collection

After Ethical Committee approved this study, health volunteer were trained for data collection. Perspective samples were approach and asked for volunteer in the study. After they agree to participate, all information about the study were informed again were consent form was presented. Then health volunteer interviewed samples one by one until questionnaires were completed.

E. Data Analysis

For analyze the data, α was set at .05 and assumption of any statistics were conducted. Descriptive statistics were utilized to describe the findings about health status and media literacy. Pearson product moment correlation was used to determine the relationship between health status and media literacy among elderly in Bakdi Subdistrict, Muang Surin.

III. FINDINGS

The findings were as followed. There were 204 elderly with years of age were 61-80 ($M = 68.28$, $SD. = 4.93$) completed structured questionnaires.

Majority of samplings were female (60.8%), never attended school (83.8%), married (50.5%), stay with descendants (58.3%), only have income from premium of elderly (89.7%), their descendants were caregivers (70.6%), and have chronic disease such as hypertension or diabetes mellitus (71.6%). However, elderly with disease rated their status not statistically difference than elderly without chronic disease ($M = 7.36$, $SD. = .48$; $M = 7.40$, $SD. = .49$, $p=.64$ respectively).

Table 1. General information

| factors | Frequency and percentage | | |
|-----------------|--------------------------|-----|------------|
| | subgroup | n | percentage |
| Sex | male | 80 | 39.20 |
| | female | 124 | 60.80 |
| Education | Never attend school | 171 | 83.80 |
| | Primary school | 33 | 16.20 |
| Marrital status | Marry | 103 | 50.5 |
| | Widow | 86 | 42.2 |
| | Divorce | 15 | 7.40 |
| Caregiver | None | 38 | 18.60 |
| | Clan | 144 | 70.60 |
| | Cousin | 22 | 10.80 |

| | | | |
|-----------------|--------------|-----|-------|
| Chronic disease | None | 58 | 28.40 |
| | At least one | 146 | 71.60 |

All of them never used social media such as email, Line, Facebook, etc. There was an only 16.7% ever used computer which all of them used computer at Elderly club and used for entertainments. These were as S. Rattanapan, W, Fongkeaw, R. Chontawan, S, Panuthai, & D. Wesumperuma, found that elderly still had limited manifested participating in elderly club and community activities (S. Rattanapun, et al. [3]). Moreover, it was very little number of elderly who search for information about treatment, health care providers, and peer health group (2.9%, 4.9%, and 4.9%, respectively). They also rated media literacy at low score. They also have very low self-efficacy score on media literacy. They stated that they chose health care providers first if they want to have more health information.

There was negative relationship among health status and media literacy in which if they rated health status as healthy they would have rate their media literacy at low score. However, There was no statically significant relationship among health status and media literacy ($p=.203$, NS). These may be because very little number who searches for health information from media, most of them relies on health care personnel. Moreover, their mobile phone can be used for calling and text messaging. These findings were supported from the findings that all of them never used social media. These findings support report from The AGE that around 50% of the older population rely on television (European Older People's Platform [1]). If they want to use other device for searching health information, they have to go to Elderly club.

IV. CONCLUSIONS

Elderly in this study rated media literacy at low score with very low self-efficacy score on media literacy. They stated that if they want to have more health information they chose health care providers first. Since, most of them have cellphone that can use for only call and text message, very low number who searched for health information from other media. There was no statically significant relationship among health status and media literacy.

V. IMPLICATIONS

The results show a low score of media literacy which illustrated the need for priority interventions based on local, regional works to improve media literacy among elderly. The suggestions from this study are that any activities lunched in Elderly club should be integrated the promoting of media literacy. However, how to promote media literacy who never attends school is very challenging job for health care providers. Therefore, research and development for develop program enhancing media literacy among elderly should be conducted.

ACKNOWLEDGMENT

We would like to acknowledge Boromarajonani College of Nursing, Surin for research fund.

REFERENCES

- [1] The European Older People's Platform, "Media Literacy, digital exclusion and older people", Age Publication, 2008.
- [2] National Statistical Office, Report on the 2007 survey of the older persons in Thailand. Nureau of Socio-Economic and Opinion 1, Bangkok, 2007.
- [3] S. Rattanapun, W, Fongkeaw, R. Chontawan, S, Panuthai, & D. Wesumperuma, "Characteristics Healthy Aging among the Elderly in Southern Thailand," CMU.J.Nat.Sci., Vol.8(2), 2009, pp.143-160.

Effect of Plasticizer and Chitosan Composition on the Plastic Biodegradable Quality from Starch Cassava Rubber (*Manihot Glaziovii*) as Alternative Plastic

Youges Putra Merly Paradika

State Polytechnic of Sriwijaya, Indonesia

yougesparadika@yahoo.com

ABSTRACT

The rapid increase in urban population in Palembang city is accompanied with the waste plastic problem which estimated 14.5 % plastic waste dominates river and soil. The biodegradable plastic is one solution to overcome the problem of environmental pollution. Plastic Biodegradable is a natural polymer that is easily decomposed by microorganisms. Starch is a polymer that can be used for bio plastic because it is easily updated, and abundant source, for example, a rubber cassava starch (*Manihot Glaziovii*). This study aimed to determine the effect plasticizers and chitosan composition of the characteristics of biodegradable plastics and obtain optimum composition. Manufacture of biodegradable plastics is done in three stages, manufacture of cassava starch rubber, the manufacture of biodegradable plastics with the addition of sorbitol, glycerol, chitosan composition variation of 50% by weight of starch that is 5 grams, and physical properties of edible film includes tensile strength, percent elongation, and biodegradation testing. Results obtained is the form of a thin sheet of plastic biodegradable tested mechanical properties. The addition of plasticizers with high levels produces biodegradable plastics with low tensile strength values, and the high percent of flexibility. While the addition of chitosan with high levels produces the opposite results. The results showed that the biodegradable plastic obtained the best results by a tensile strength that is on the composition of 0% Sorbitol + 0% Glycerol + 50% Chitosan is 0.00980 MPa. While based on the percent elongation of the best results that the composition 20% Sorbitol + 15% Glycerol + 15% Chitosan is 3 %, and all of the resulting plastic degraded completely less than 60 days, the media plastic waste water more quickly degraded. The biodegradable plastic is one solution to plastic waste problem of environmental pollution. Plastic Biodegradable is a natural polymer that is easily decomposed by microorganisms and Biodegradable plastic can be answered one of environment problem in Palembang city about plastic waste.

Keywords: Bioplastics, Cassava rubber starch, Chitosan, Tensile strength, Biodegradable

I. INTRODUCTION

Approximately 20% of Palembang waste volume is plastic waste. 14.5 Percent of plastic waste dominates garbage in rivers and soil, meaning every day 150 tons of garbage dumped to the ground and river. The plastic waste can not be broken down by microorganisms, consequently we are constantly in need of areas for waste disposal. Although not toxic, plastic waste can cause soil contamination, in addition to damaging the scene. Plastic is one of the world's environmental problems, especially in Indonesia due to the properties of plastics that are difficult to unravel. According to statistics on waste in Indonesia Deputy Pollution Control Ministry of Environment (MOE) in 2008, said that based on an estimate of 26 metropolitan cities with a total population of 40.1 million people generate 14.1 million tons of waste. Plastic waste reached 14% or 5.4 million tons per year and ranks second only to kitchen waste / organic .

Various efforts and innovations reducing the impact of plastic waste has been carried out. In addition to recycling plastic, environmentally friendly plastics have also been developed. Plastic made from synthetic chemicals are

lightweight, strong, elastic and not easily decomposed replaced with biodegradable raw materials by the parser, called Biodegradable plastic.

The main ingredient manufacture Biodegradable plastic is starch. Starch is used as a material that can be easily degraded by nature into compounds that are environmentally friendly. Starch is a polymer type that is naturally produced by plants types of tubers, maize, and rice (generally, the starch found in plants that contain lots of carbohydrates) in the form of fine grains . One of the innovations in the manufacture of biodegradable plastic is to utilize cassava starch derived from rubber. Rubber Cassava is one of the varieties of cassava starch source which has a huge potential used as raw material for making plastics biodegradable. Besides cassava rubber is one kind of cassava tree containing toxic compounds are not traded and HCNm so underused by the public Risky Aryani (2014) have examined the manufacture of biodegradable plastics from starch cassava rubber.

Based on these studies, it is necessary to further study regarding the composition of the addition of plasticizers and chitosan. The addition of plasticizer aims to improve the mechanical properties of biodegradable plastics. In addition to plasticizer, the manufacture of biodegradable plastics need to be added as a biopolymer chitosan that is useful to improve

the mechanical properties as chitosan can form hydrogen bonds between chains with amylose and amylopectin

II. RESEARCH METHOD

A. Place and Time

The method used in this research is experimental method. Data collection using observation method. The study was conducted for approximately one month from March 14th, 2016 to April 14th, 2016, and was conducted in the Operation Unit Laboratory State Polytechnic of Sriwijaya.

B. Tools and Material

• Tools

1. Knife
2. Hot Plate
3. Tool of grated coconut
4. Filter
5. Beaker Glass 100 ml
6. Measuring glass 100 ml
7. measuring Pipette 10 ml
8. Rubber ball
9. Thermometer
10. Magnetic stirrer
11. Spatula
12. analytical balance
13. Mortar
14. Glass Plate
15. Stirrer
16. Elongation test tools

• Material

1. Cassava Rubber
2. Sorbitol
3. Glycerol
4. Chitosan
5. Acetic Acid
6. Aquadest

C. Treatment and Research Design

Research of Making biodegradable plastic is preceded by the making of starch from cassava rubber. Stages in making starch cassava rubber are washing, stripping, slicing, smoothing, drying, and filtering. After that making of biodegradable by using Starch cassava rubber and added plasticizer sorbitol , glycerol and chitosan with certain variations. Plastic printing is done by plastic molding on top of the glass mold then dried at room temperature, then analyzed.

D. Preliminary Research

This preliminary study was conducted to obtain the main research objectives, namely to get the starch cassava rubber

that will be used for the main research is the making of biodegradable plastic.

E. Main Research

The main research was conducted to determine the absorbent optimum composition. Sorbitol, glycerol and chitosan in the making of biodegradable plastic from cassava rubber starch. Stage of research that will be done affixed chart shown in picture below.

F. Experiment Procedure

Making of rubber cassava Starch

1. Soaked cassava rubber in air for 1-2 days
2. Shredded rubber cassava by using grated coconut
3. Looking cassava rubber that has been shredded for separation of cassava rubber dregs and Cassava rubber starch.
4. Prepared cassava rubber starch has been obtained
5. Dried for 1-2 days in the sun
6. Sieve for the size of a smooth size
7. Gotten cassava rubber starch is smooth and white colored

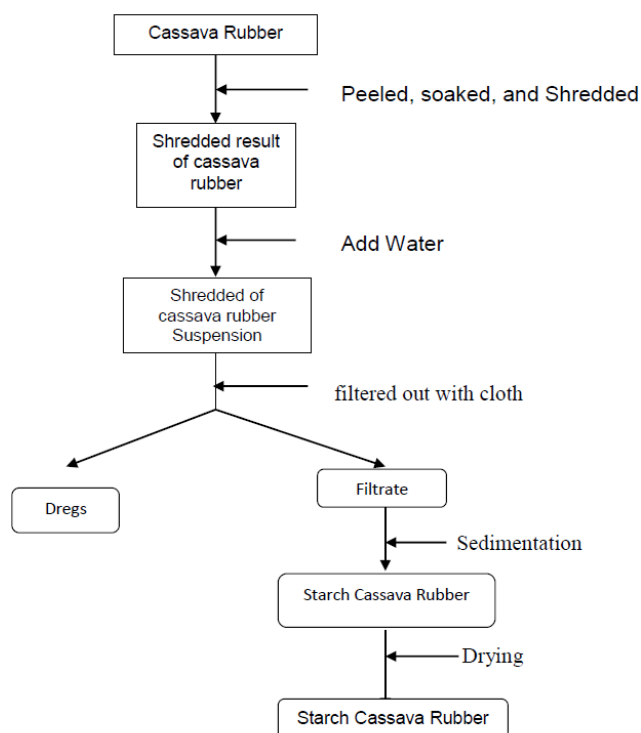


Figure 1. Flow Chart Making of Starch Cassava Rubber

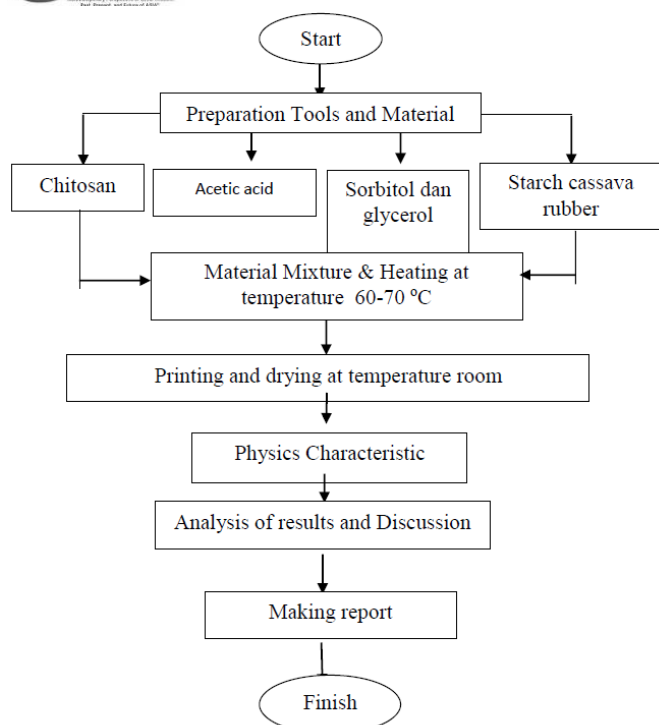


Figure 2 Flow chart of Making of Biodegradable

G. Making of Biodegradable Plastic

1. Weighed 5 grams of cassava rubber starch
2. Weighed chitosan with variation of composition 50%, 25%, 20%, 15% from starch weight
3. Prepared Plasticizer (Sorbitol and Glycerol) with variations of composition of 50%, 25%, 20%, 15% by weight of starch
4. Chitosan chitosan by using Acetic Acid 1 ml
5. Mixed all ingredients that have been prepared into the beaker
6. Heated and stirred all mixture above the hot plate at 70oC at 200 rpm until gelatination occurs
7. Poured a diluted solution on a glass mold
8. Flatten the diluted solution using a ruler
9. Silenced plastic that has been printed at room temperature for 2-3 days until drying
10. Obtained biodegradable plastic from cassava rubber starch in rectangular shape according to the size of the glass mold

H. Biodegradable Plastic Analysis

The main ingredient in this study are rubber and cassava starch plus supporting material, namely sorbitol, glycerol as plasticizer and chitosan composition v ariation of 50% by weight starch. The manufacture of biodegradable plastics is done in three stages. The first stage is to make cassava starch

rubber, where the rubber before made cassava starch is soaked in water for 1-2 days which aims to eliminate the levels of HCN.

The second stage of the manufacture of biodegradable plastics is done using blending methods by mixing all the ingredients together and heated to a temperature of 75oC or occur gelatinization after that the solution has gelatinization was poured on a glass plate to be printed. The last stage is the analysis of physical properties of biodegradable plastics where physical properties are analyzed, tensile strength, elongation test, and the biodegradation test.

- *Tensile Strength*

Pull test mechanical properties are closely related to the chemical structure of the plastic biodegradable. Tensile strength shows the maximum force required to break the plastic. These properties depend on the type of plastic material maker that influence the properties of biodegradable plastics structural cohesion.

- *Test Percent Elongation*

Elongation is the process of changing the maximum length at the time of stretching to biodegradable plastic samples disconnected.

- *Biodegradation Test*

Biodegradation test aims to determine how long the sample is degraded. Biodegradation is defined as the ability of the material to be easily degraded by microbes. The process of degradation occurs, releasing carbon dioxide and water in nature. According Subowo (2013), the technique of soil burial test is one test biodegradation by soil microorganisms as an auxiliary control degradation processes .

III. RESULT

A. Bioplastics Result



Figure 3 Bioplastics produced a sheet of thin and transparent

Table 1 Tensile Test Results Analysis & Percent Elongation

| Number of Sample | Plasticizer Variation (%) | | | Tensile Strength (Mpa) | Percent Elongation (%) |
|------------------|---------------------------|----------|----------|------------------------|------------------------|
| | Sorbitol | Glycerol | Chitosan | | |
| 1. | 25 | 25 | 0 | 0,00204 | 1,000 |
| 2. | 25 | 0 | 25 | 0,00686 | 0,500 |
| 3. | 0 | 25 | 25 | 0,00271 | 0,500 |
| 4. | 20 | 15 | 15 | 0,00490 | 3,000 |
| 5. | 15 | 20 | 15 | 0,00490 | 2,000 |
| 6. | 15 | 15 | 20 | 0,00729 | 0,500 |
| 7. | 50 | 0 | 0 | 0,00204 | 2,000 |
| 8. | 0 | 50 | 0 | 0,00294 | 1,000 |
| 9. | 0 | 5 | 50 | 0,00980 | 0,100 |

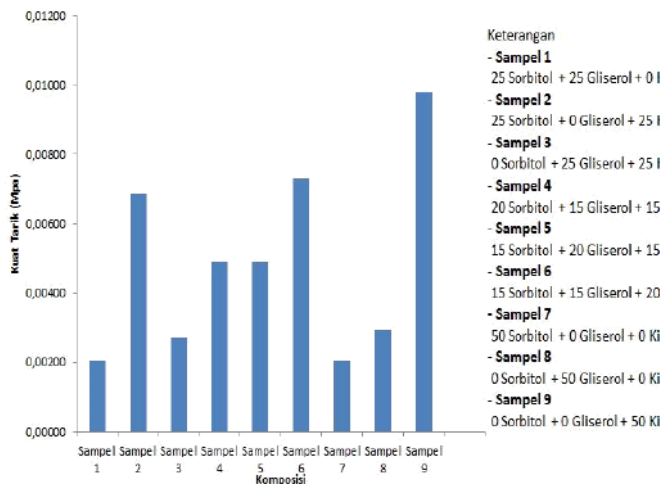


Figure 4 Graph tensile test



Figure 3 .1 Bioplastics produced a sheet of thin and transparent

Table 1.1 Tensile Test Results Analysis & Percent Elongation

| Number of Sample | Plasticizer Variation (%) | | | Tensile Strength (Mpa) | Percent Elongation (%) |
|------------------|---------------------------|----------|----------|------------------------|------------------------|
| | Sorbitol | Glycerol | Chitosan | | |
| 1. | 25 | 25 | 0 | 0,00204 | 1,000 |
| 2. | 25 | 0 | 25 | 0,00686 | 0,500 |
| 3. | 0 | 25 | 25 | 0,00271 | 0,500 |
| 4. | 20 | 15 | 15 | 0,00490 | 3,000 |
| 5. | 15 | 20 | 15 | 0,00490 | 2,000 |
| 6. | 15 | 15 | 20 | 0,00729 | 0,500 |
| 7. | 50 | 0 | 0 | 0,00204 | 2,000 |
| 8. | 0 | 50 | 0 | 0,00294 | 1,000 |
| 9. | 0 | 5 | 50 | 0,00980 | 0,100 |

B. Tensile Strength test

The first analysis is an analysis of tensile strength, this test aims to determine the resistance of a material to loading at the point of bending and also to determine the elasticity of a material [7] Figure 2 shows that the more the chitosan composition of the tensile strength will be even greater. This is seen in the sample with a composition of 15% sorbitol, 15% glycerol, and 20% chitosan as well as samples with composition 0% sorbitol, 0% glycerol, and 50% chitosan. Where the chitosan composition is more dominant than the plasticizer effect of chitosan greater tensile strength greater cause This is due to the addition of chitosan increases the density of the alloy so that the structure of the resulting polymer increases and difficult to cut off [8].

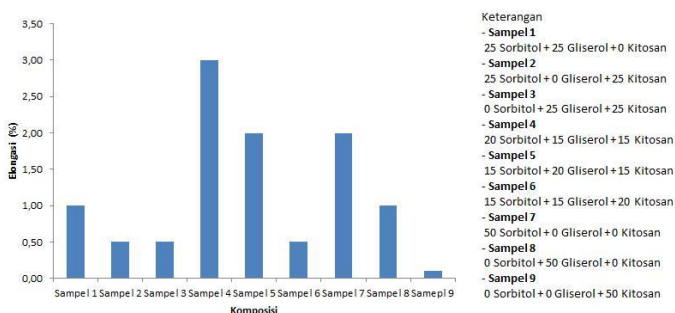


Figure 5 Graphic Test Elongation Percent

IV. DISCUSSION

A. Bioplastics Result

Figure 3.1 is a biodegradable plastic products produced, in the form of thin sheets, and transparent, biodegradable plastics in addition to chitosan more properties rigid and hard plastic, while plastic has plasticizer composition that has many properties of elastic and thin.

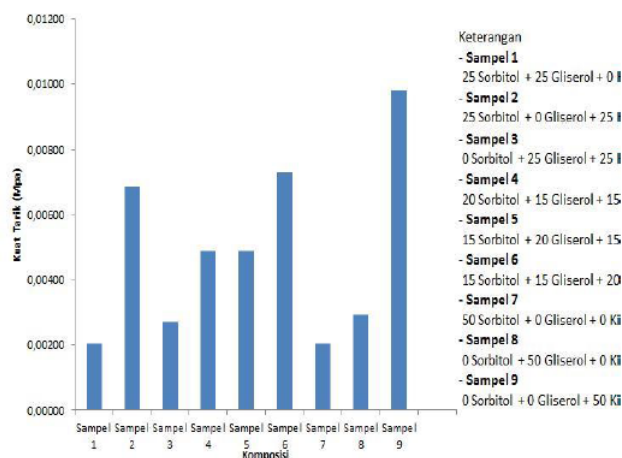


Figure 4.1 Graph tensile test

Composition of chitosan and the plasticizer also affect the physical properties of the biodegradable plastic. According Krochta (1997), higher concentrations of the chitosan produced plastic structure more rigid and hard, causing the value of the resulting high tensile strength. [9].

When compared with the standard international plastics (ASTM5336) in (Utomo, 2013) the magnitude of the tensile strength of PLA plastic from Japan reached 2050 MPa and plastic PCL of England reached 190 Mpa. According Darni and Herti (2010) the amount of tensile strength of the plastic by Indonesian national standard is 2.47 to 302 MPa. While the magnitude of bioplastics

produced tensile strength of this study was 0.00980 MPa, where great tensile strength are not in accordance with the standards used by the plastic PCL of UK and Japanese standard of PLA plastics and plastic SNI. This is because since the products produced are not entirely of plastic, but rather a new, plastic.

The test results also show the same thing to the research conducted by Nurfajrin, Z (2015), the research conducted is the manufacture of edible film of starch banana peel with the addition of chitosan and glycerol as a plasticizer. Tensile strength values in glycerol 2 ml, 4 ml, and 6 ml respectively amounted to 23.78 kg / cm², 34.78 kg / cm², 37.45 kg / cm². more plasticizer added, the tensile strength will be reduced.

C. Percent Elongation Test

Percent Elongation is the mechanical properties are closely related to the physical properties of biodegradable plastics. Elongation or elongation is the maximum length change during a stretch until the sample is disconnected. In Figure 5.1, the result is the addition of sorbitol directly proportional to the percent elongation that means the greater the concentration of sorbitol the more percent elongation.

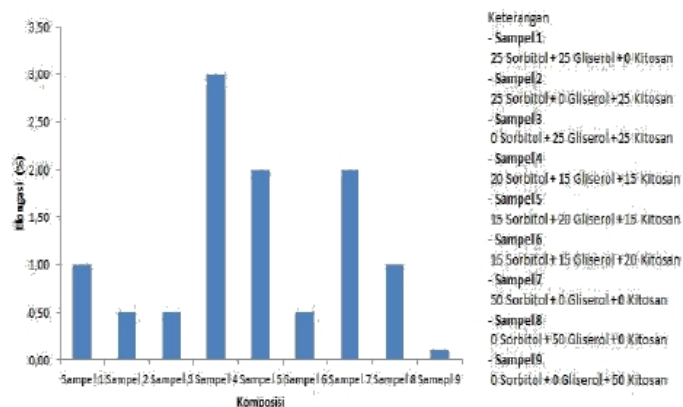


Figure 5.1 Graphic Test Elongation Percent

THE OPTIMUM CONDITIONS FOUND IN 4 SAMPLES (20% SORBITOL, 15% GLYCEROL, 15% CHITOSAN) AND PERCENT ELONGATION OF BETWEEN 3% AND MINIMUM CONDITIONS CONTAINED IN THE SAMPLE 9 (0% SORBITOL, 0% GLYCEROL, 50% CHITOSAN) THAT THE ELONGATION OF ONLY 0, 10%. WHEN COMPARED WITH THE STANDARD INTERNATIONAL PLASTICS (ASTM 5336) THE PERCENTAGE OF ELONGATION (ELONGATION) FOR PLASTICS PLA FROM JAPAN REACHED 9% AND PLASTICS PCL OF UK REACHED MORE THAN 500%, ACCORDING DARNI AND HERTI (2010) MAGNITUDE% ELONGATION BASED ON NATIONAL STANDARDS OF INDONESIA IS 21 - 220%. THE AMOUNT OF ELONGATION BIOPLASTICS PRODUCED FROM THIS RESEARCH HAS NOT BEEN IN ACCORDANCE WITH THE STANDARDS USED BY PCL OF THE UK PLASTICS AND PLASTIC PLA STANDARD OF JAPAN, AS WELL AS THE NATIONAL PLASTIC STANDARD (SNI).

THE ADDITION OF PLASTICIZER ABLE TO REDUCE BRITTLINESS AND INCREASE THE FLEXIBILITY OF THE POLYMER FILM BY MEANS OF DISRUPTING HYDROGEN BONDS BETWEEN ADJACENT POLYMER MOLECULES SO THAT THE TENSILE STRENGTH OF THE INTERMOLECULAR ATTRACTIVE POLYMER CHAINS TO BE REDUCED AS A RESULT OF THE ADDITION OF PLASTICIZERS.

D. Biodegradation test

Biodegradation test was conducted to determine the sample time bioplastics to degrade. Biodegradability process can occur with soil burial test technique where by controlling soil microorganisms maid degradation process. The process of biodegradation test analysis was carried out for less than 60 days, the tested plastic cut to size 2cm x 2cm. This test is conducted on each sample in soil media and water media. In the soil media, plastic planted in the ground for 60 days, in the sample biodegradable plastics have decomposed completely because the intensity of the microbes in the soil is very much.

While in aqueous media, placed inside plastic containers have water contains different media that is using rain water, well water, waste water, distilled water, and water taps. During the 60 days most of the plastic has been degraded completely. the waste water completely degradable plastic is faster than other media due to the intensity of the water which microbes in the waste water is high enough. in some samples biodegradable plastics have not seen shriveled and in some parts there is a cracked and overgrown mushroom samples, and also changes the color of the water becomes murky and slimy.

According to international standard (ASTM 5336) the length of degradable plastic films for PLA plastic from Japan and PCL from the UK will need 60 days to decompose as a whole (100%) (Coniwanti P, 2014). The length of degraded resulting from this research are less than 60 days to decompose almost all (85%). This proves that our results meet the criteria for the degradation of plastic film. Based on the composition of the plasticizer and chitosan, chitosan composition of the plastic has more, relatively longer be decomposed due to chitosan as a preservative, either Chitosan is used as an additive in the manufacture of plastic because it has properties micro anti bacteria (Dutta et al., 2009).

V. CONCLUSION

From the research that has been done can be concluded that:

1. Plastic Products from starch cassava rubber is type biodegradable can decompose by good microorganism on soil media and water media.
2. In the tensile strength test obtained best result on samples without plasticizer (0% sorbitol , 0% glycerol , 50 % chitosan) is 0,00980 MPa, while the elongation test obtained best result in the sample , plasticizer dominant is 20 % sorbitol , 15% glycerol , 15% chitosan with percent elongation is 3 % .
3. Biodegradable plastics produced based on the value of tensile strength test , the physical properties is rigid and hard , while based on the value percent elongation , the physical of biodegradable plastics is more elastics. Based biodegradation test , biodegradable plastics produced have the physical properties can decompose completely in less than 60 days on soil and water media and biodegradable plastics can not be applied as a food packaging because it is still very fragile and so fast moldy.
4. The biodegradable plastic is one solution to plastic waste problem of environmental pollution. Plastic Biodegradable is a natural polymer that is easily decomposed by microorganisms and Biodegradable plastic can be answered one of environment problem in Palembang city about plastic waste.

CONFLICT OF INTEREST

Effect of Plasticizer and Chitosan composition on the Quality of Plastic Biodegradable from starch Cassava rubber (*Manihot Glaziovii*) As Alternative Plastic certify that the findings Paper writing that we create is purely the result of the findings of the work of Our Own (Not plagiarism).

ACKNOWLEDGEMENTS

Thanks to Ms. Meilianti , S.T. , M.T. as Supervisor.

VI. REFERENCE

- [1] Septiosari, Arum, et al. 2014. Preparation and Characterization of Waste Bioplastics Mango Seed With Addition of Cellulose and glycerol. Indonesian Journal of Chemical Science 3, Volume 2, Page 157-162
- [2] Darni, Yuli and Herti Utami. 2010. Preparation and Characteristics of Mechanical Properties and Hydrophobicity Bioplastics from Sorghum Starch. Journal Chemical and Environmental Engineering, Faculty of Engineering, University of Lampung Bandar Lampung. Vol.7, 4, Page 88-93
- [3] Briassoulis, D. 2004. An Overview on the Mechanical Behaviour of Biodegradable Agricultural Films. Journal of Thermal Analytics and Calorimetry, 12: 65-81.
- [4] Aryani, Riski. 2014. Making Biodegradable Films Using Cassava Starch Rubber (*Manihot glazovii*). Palembang: State Polytechnic of sriwijaya.
- [5] Ferdinand, Arief.2015. Effect of Plasticizer composition and Chitosan against mechanical sifat bioplastics from starch tuber taro. Department of Chemical Engineering. State Polytechnic of Sriwijaya
- [6] Sari, Diah Permata. 2014. Making use Biodegradable Plastic Starch from Tubers Keladi. Department of Chemical Engineering. State Polytechnic of Sriwijaya.
- [7] Utomo, Rev. Arif et al. 2013. Effect of Temperature and Drying Against Old Fisikokimiawi Characteristics of Biodegradable Plastic Composites Tongue Buaya-Starch Chitosan. Department of Agricultural Engineering Faculty of Agricultural Technology Universitas Brawijaya. vol.1,1, Page 73- 79
- [8] Nurfajrin, Z. D., Mahendrajaya, G. S., & Sukadarti, S. 2015. Characterization and Properties Biodegradation of Starch Edible Film Skin Jackfruit Banana (*Musa Paradisiaca* L.) with Addition of Chitosan and Glycerol Plasticizer. Proceedings of the National Seminar on Chemical Engineering "Kejuangan". Yogyakarta, March 18, 2015
- [9] Krochta, J.M. and Johnston, C. D.M. 1997. Edible Films and Biodegradable Polymer J. Food Technol. 51 (2). 61.



Education and Social Science



Preserving 'Kampung Pulo' Local Wisdom, Garut, Indonesia

Ethnography of Communication Study of Local Wisdom Symbolic Meaning for Kampung Pulo, Garut, Indonesia.

¹ Afni Faujiah, ² Hafidin Syarif Huda, ³ I Gusti Wayan Albar

^{1,2} Communication Management Department, Faculty of Communication, Padjadjaran University, Sumedang, Indonesia

³ TV & Film Department, Faculty of Communication, Padjadjaran University, Sumedang, Indonesia

E-mail: ¹afnifauziah04@gmail.com, ²hafidin121@gmail.com, ³igustiw@gmail.com

ABSTRACT

Kampung Pulo is a traditional village located in Garut, Indonesia. Located in the middle of a small island surrounded by a large lake so that this village is famous as "Kampung Pulo". This village has been established since the 17th century and his descendants are scattered in various regions, even to foreign countries, one of the Netherlands. There are relics of Hindu temple building adjacent to the tomb of a disseminator of Islam which is a symbol of inter-religious harmony and is characteristic of the area. Uniquely, until now they still maintain the local wisdom, that is musn't change the shape of the building, not allowed to add or reduce the number of custom homes and head of the family that only 6 houses and 6 heads of family, the head of the family should not work outside Kampung Pulo, should not hit the goong musical instruments, and can't keep four-legged animals. All of it is taboo to be violated. If there is a violation, then it is believed there will be a great disaster overwrite the village. Because of its unique, this village is become tourism village and visited by domestic and foreign tourists to know the history and development of their lives to date. This research based on observations in Kampung Pulo and interviews to the parties concerned and also from literature studies. The data were analyzed by referring to theories. There is theory of symbolic interaction and social identity. It explains the interactions used in constructing meaning that ultimately create the distinctive behavior that differentiates Kampung Pulo from other cultures. The method of this research is qualitative. Goals of this research are revealing how people in Kampung Pulo successfully defended the symbolic meaning of local wisdom and create the identity as information about communication, tourism promotion, especially in Garut, Indonesia, and Asia for all of the elements such as experts, academic staffs, students, government, and society in the world. The result of research is communication pattern and symbolic meaning of local wisdom.

Keywords : component; Local Wisdom, Culture, Taboo, Village, Tourist, Traditional, Interaction, Identity.

I. INTRODUCTION

Local wisdom is about the truth which is rooted in an area. It is a culture product which is being life guidance for people from one to other generation continuously. Although it is a local value, the core value inside of it is believed to be universal value. Local wisdom is created as the superior culture of such society.

Such a place in the middle of Small Island which is surrounded by lakes only can be visited by boat to cross the lake. Such place which still holds the local wisdom tightly is Kampung Pulo, Garut, Indonesia who the people are the descent of Mbah Dalem Arief Muhammad, the pioneer of Kampung Pulo. The local wisdom here is created as the acculturation result of Hindu culture transition being Islam culture. The finding of two archaeologies in one location those are Cangkuang Temple with Dewa Siwa statue side by side to Mbah Dalem Arief Muhammad cemetery as the disseminator of Islam, being the evidence of the acculturation process.

Some believe kept by people in Kampung Pulo are: people there forbidden to visit the cemetery on Wednesday, they do not allow to strike the bronze big bell (Gong besar), they banned to build prism (jure) roof, they also forbidden to add or decrease the main building and

the family leader, it means that there must be 6 house and 6 family leader, and the last they banned to keep the animal with four legs. Even this place is the traffic of tourist who come to Situ Cangkuang.¹

Uniquely, since XVII century up to now that local wisdom which being the tradition of Kampung Pulo never be faded although people also follow the improving technology. It is because of their interaction which they use to build a meaning then it creates the custom attitudes that make them different from other culture. The local wisdom of Kampung Pulo is including some taboo. They believe that there will be a disaster if their attitude is different with the norm or custom.

The things which are taboo sometime just thought only as a myth but for us, those things have such important vision and function in the society and may explain the symbols that only can be described by them who are in the Kampung Pulo. For example node your head can be mean "yes" for Indonesian but it means "no" for Indian. Therefore, this study is important to be done.

The things which are taboo sometime just thought only as a myth but for us, those things have such important vision and function in the society and may explain the symbols that only can be described by them who are in the Kampung Pulo. For example node your head can be

mean “yes” for Indonesian but it means “no” for Indian. Therefore, this study is important to be done.

According to the explanation above us formulate the problem of the study as follows: what are the symbols of local wisdom of people in Kampung Pulo, how the people in Kampung Pulo interpret the symbols, and how the communication patterns of people in Kampung Pulo to maintain their local wisdom. Then, the aims of the current study are to show how Kampung Pulo people success to maintain the symbolic meaning from that local wisdom and make identity as the information about communication, tourism promote, especially in Garut, Indonesia and Asia for all elements such as expert, academic staff, collage, government, and people in the world. Moreover, the result of the study is about the communication pattern and symbolic meaning of local wisdom.

II. THEORITICAL FRAMEWORK

A. Previous Research

There are some previous studies which related to the present study. According to the explanation of the previous studies the writer may show the position of the current study so that the originality of the study is no doubt. The The different of the study about Preserving “Kampung Pulo” Local Wisdom, Garut, Indonesia from Review of related Literatur will be shown in table 1.

B. Literature Review

(1) Language, Communication, and Culture

Each society has its own uniqueness so there will be no two similar societies in the world. Social environment may help people to adapt and create them different from one to another. Then, it influences the communication and language used by the society.

Language is being the core of communication and by it people make society and culture. Unintentionally language also has a role in creating human culture. As we know, culture is about all of thing which belongs to the society. Culture is life guidance from such society in the form of attitude, believes, value, and symbols that they accept unknowingly or without thought where all of them inherit through communication process and imitating from one generation to another [1].

The relation between language, communication and culture creating a linguistics relativity hypothesis from Safir and Whorf which explain that “language structure and speaking rule of such culture will decide the attitude and pattern in that culture.” Language is being the main element of a culture because it will decide how people as speaker such a language categorize their experience [2]. Language life in communication to create a culture then the culture will decide the communication system and language form that suitable for them.

(2) Symbolic Interaction Theory

According to the theory of symbolic interaction, social life is essentially human interaction that uses symbols, they are interested in how humans use symbols that

represent what they mean to communicate with each other. And also influences arising from the interpretation of these symbols on the behavior of the parties is seen in social interaction.

A person's behavior is influenced by symbols given by others, as well as the person's behavior. Through the signing of symbols, we can express feelings, thoughts, intentions, and vice versa by reading symbols displayed by others. According to Mead's thoughts in [3], a brief definition of three basic ideas of symbolic interaction is mind, self, and society.

This theory concludes that social interaction is essentially symbolic interaction. Humans interact with others by conveying symbols, and others give meaning to the symbol.

(3) Social Identity Theory

A character in social psychology, Tajfel (1957) spawned a social identity theory that stated social identity is part of one's self-concept derived from their knowledge of membership in a social group along with the significance and emotionality of the membership. Social identity relates to the involvement, caring and feeling of members in a particular group [4].

The people of Kampung Pulo have a tradition that is adhered to from generation to generation. Every new descendant of the Pulo Kampung family has been confirmed as a member of the group and is binding. Turner reveals social category as the division of individuals based on race, class, occupation, gender, religion, and others. Social categories relate to social groups defined as two or more persons who perceive themselves or consider themselves part of the same social category. An individual is at the same time a member of various categories and social groups, and that's where someone has a social identity.

III. RESEARCH METHODS

The current study use qualitative ethnography approach. Qualitative approach is research which use inductive approach analysis that is investigating something from specific up to general to find out a theory. Researcher must think inductively, record many social facts or phenomenon in the field then analyze it and try to theorize based on what he/she analyze [5].

Communication ethnography looks the communication behavior as the behavior which appear from integration of three creativities that belong to each

¹ Efener. 2012. *Masyarakat Adat Kampung Pulo*. Web: <http://www.disparbud.jabarprov.go.id/wisata/detail.php?id=28&lang=id>. Accessed on Thursday, 2 Feb 2017. 13 26 WIR

people as social human. The three creativities are including into linguistic, social interaction, and culture creativity [2]. This study is done in Kampung Pulo, Garut, Indonesia. The objective of the study is the meaning of social interaction of Kampung Pulo which born the local wisdom there which still exist until now.

The data source of this study is from informant chosen by using purposive sampling technique with

criteria they are real people of Kampung Pulo. Meanwhile, the data collection technique is interview (in-depth interviews), participant observation, and documentation. The researcher use Creswell model to analyze the data those are description analysis, and interpret [2].

Table 1
The difference of the study about Preserving “Kampung Pulo” Local Wisdom, Garut, Indonesia from Review of related Literatur

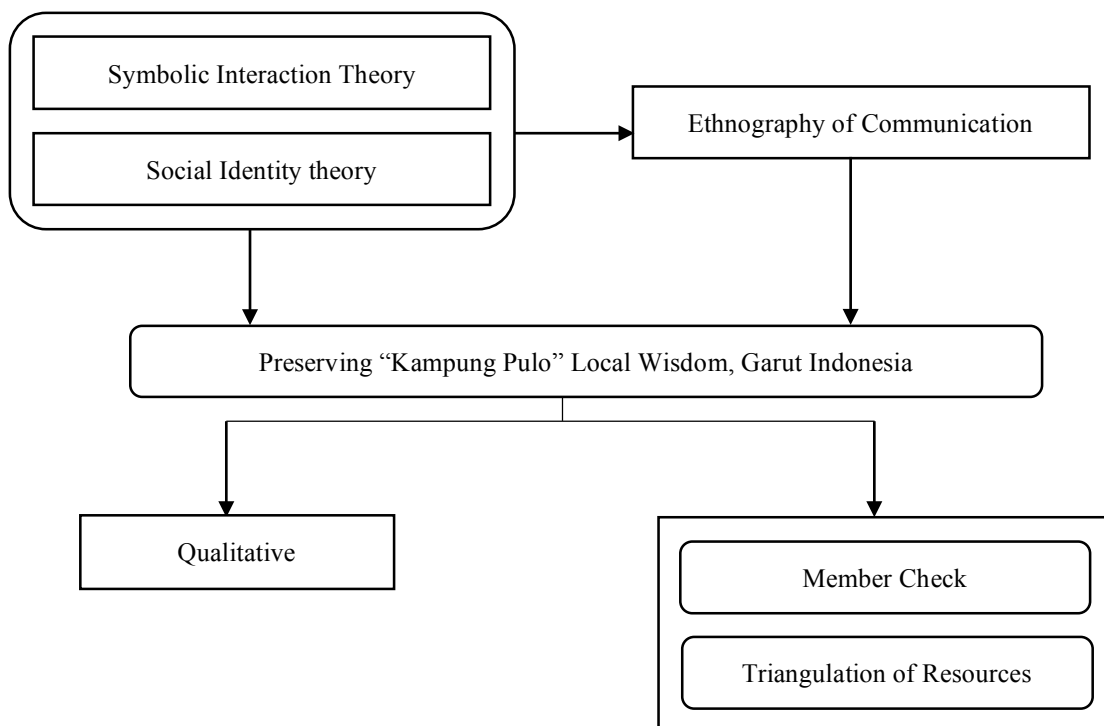
| Research Tittle | | | |
|---------------------------------|--|---|--|
| Author | Tradition <i>Ngaplus Imah</i> In Kampung Pulo Garut district, West Java Province | Communication Interaction Oral Tradition Rule <i>Basiacuang</i> in Kampar Riau Malay Customary Marriages | Preserving “Kampung Pulo” Local Wisdom, Garut, Indonesia |
| | Prijana | Nova Yohana & Kurnia Husmiwati | Afni Faujiah, Hafidin Syarif Huda, & I gusti Wayan Albar |
| Description of the study | Kampung Pulo has tradition called ngapulus imah that has been managed by the norms assign that a daughter as the substitution of tradition house. The old people who life in tradition house switch their roles as family member of new occupant. Not demanding possibilities that the replacement occupants come from the outside of main family as long as the daughter is purely the descent of Kampung Pulo. | The tradition or verbal culture of basiacuang now days still used in wedding tradition of people with melayu Kampar speech. The sentences in basiacuang being such message for the speaker and the listener because have social function and philosophic meaning for people of Melayu Kampar. | The local wisdom of Kampung Pulo is still maintained very well. The things which being the local wisdom are including the taboo things that cannot be violated by them. Of course that symbol contains their own meaning and perfectly believed by people there. Such thing which is being the tradition bond and life guidance of people in Kampung Pulo. |
| Focus of the Study | The tradition of ngapulus imah in social life of Kampung Pulo people. | Communication rule of basiacuang verbal tradition in wedding custom of Melayu Kampar through communication ethnography perspective. | Interaction rule of communication pattern being the reason of maintaining of such local wisdom in Kampung Pulo. |
| The aims of the Study | Describe clearly in detail the plot or procedures of ngapulus imah in Kampung Pulo | Explain the linguistic rule, social interaction rule and culture usage of verbal tradition of basiacuang by people of Melayu Kampar Riau in wedding custom. | Describe clearly the real meaning of the symbols which is shown by people in daily and only can be understand by the people via communication act and communication pattern . |
| Research Approach | Descriptive | Ethnography of Communication | Ethnography of Communication |

Sources: Processed from various sources, 2017

Table 2
Informant

| No | Name | Age | Status |
|----|---------------------|-----|---|
| 1 | Umar | 46 | Residents of kampung Pulo, 10th generation |
| 2 | Ida | 60 | Residents of kampung Pulo, 9th generation |
| 3 | Yayat | 45 | Residents of kampung Pulo, 10th generation |
| 4 | Imas | 45 | Residents of kampung Pulo, 10th generation |
| 5 | Nenah | 47 | Residents of kampung Pulo, 10th generation |
| 6 | Tatang Sanjaya | 63 | Residents of kampung Pulo, 9th generation |
| 7 | Siti Hartati | 38 | Residents of kampung Pulo, 10th generation |
| 8 | Dadan Ramdhani | 29 | Secretary of Cangkuang Village (Kampung Pulo) |
| 9 | Dade Mazhuni M.Si | 62 | Historian |
| 10 | Wawan Kurnaedin S.E | 60 | Head of UPTD Cangkuang, Garut Tourism Office |

Source: result of research, 2017.



Picture 1. Thinking Framework

IV. FINDING AND DISCUSSION

A. *The Local Wisdom Symbol and Meaning in Kampung Pulo.*

Language is people's tool to communicate with others and tool to think. Therefore language is functioned as mechanism to communicate and also as the guidance to see the social reality because language may affect the perception, share and create the thought. Language is delivered by

symbols and always has a meaning. According to the present study, the writer gets the correlation of what are the symbols of local wisdom of Kampung Pulo society and how they interpret them. Supposedly, they who break the rule from this tradition will get terrible violence on themselves. They will get punishment from nature that surely will happened although no one knows when it will happen. That symbols are in the following:

- Visiting on Wednesday Night Wednesday
The enactment of prohibition about visiting on Wednesday night Wednesday is related to the history of Kampung Pulo. Before being Muslim, Kampung Pulo people are Hindu and on Wednesday night Wednesday is the best day for them to pray, by praising the Dewa Siwa statue. Therefore, this prohibition is used to avoid the misunderstanding in religion. They worry that if visiting is allowed, the headstone and cemetery will be used to praise also. This prohibition is aimed to avoid the discrimination in different religion so that one of the religions there not feel isolated or considered bad, that is tolerance among religious people.
- Change/Decrease the main Building and Family Leader
This thing has meaning and relation with the symbol of the fact that Mbah Dalem Arif Muhammad has 6 daughters which symbolized by 6 houses and 1 mosque as the symbol of 1 son. The son is symbolized by mosque because he was dead during circumcision so that, he never has their own family and mosque being his symbol. In this case the house just for one family leader. It is encouraging the emergence of other tradition that is Ngapulus Imah where the inheritance right is given to the daughter because they follow the matrilineal system. The meaning inside this symbol actually is about parental concern toward their children. When the parents have deadd the house will belong to their children directly.
- Banned To Strike Bronze Big Bell And To Use Roof In Prism/Jure Shape
These two prohibitions can be explained from the event when Mbah Dalem Arif Muhammad do circumcision to his son who was paraded through jampana with prism roof. Nowadays, the form of jampana is design in many ways, even some of them are covered by animal design such as Leon to give heroic impression. That event was also enlivened by entertaining music of gamelan and big bell. When the event is in progress and the bell was strike, the hurricane was coming, and that son suddenly felt down and dead. Since that day, Mbah Dalem Arif Muhammad suggests their descent not to make a house with prism roof and not to make entertainment with big bell. Actually it means that people must tolerance to others, not to disturb them with noisy.
- Banned to Keep the Big Animals with four Legs
It has meaning of people in Kampung Pulo has taught to life clean and some of them work as farmer that's way they worry if that animal will destroy anything that has been taught since in the past. Even more, now there are many sacred cemeteries that must be kept well. They think that the animals with four legs will break that cemetery.

Symbolic interaction theory state that basically human is relational creature. Every individual surely has relation with others. This theory explains to us that when people interact with others, they will share the meaning for such time and such acts. The meaning here is closely related the shown symbols because according to Langer, symbol is the causes of all of knowledge and understanding which is owned by human [6].

Symbol is shown through language, whether verbally or non-verbally. Sometime, some symbols only can be understood by them who have the same perceptions and agree with the meaning of such symbol for instance culture society. They do interaction, creating of same thinking pattern and ended by the same identity. Unintentionally, the agreed symbol also creates the group identity.

It is coherence with the states of culture include all of things that belong to the society. Every culture has its own behavior pattern. Culture teaches human to live in harmony with nature and also guide human to interact with others. According to the Budiono Kusumohamidjodjo opinion in his book of *Filsafat Kebudayaan; Proses Realisasi Manusia* which state that every individual has status and role. The status can be meant as the position of people in the society, while role is always being correlate of the status [7]. As well as people in Kampung Pulo that have status as traditional people and do their role by acting as traditional people, one of them not visit on Wednesday night Wednesday.

B. Communication Pattern of People in Kampung Pulo in Kept Their Local Wisdom

Basically, human creates culture or their social environment as their adaptation toward physical biological environment. All Customs, practices, and traditions are used to live continuously and thrive inherited by one generation to next generation in such society. The future generation has set to receive such truth about life in their environment, prohibition and values are applied, and through many ways people accept the behavior that allowed living in that society. In this case believing is important thing to create a culture

As well as people in Kampung Pulo, the existing culture is the heritage from their ancestor, reflected in the form of their behavior. Not only to save their tradition but people in Kampung Pulo believe that those tradition must be done and if not it may cause a disaster. By keep these traditions they also praise their ancestor.

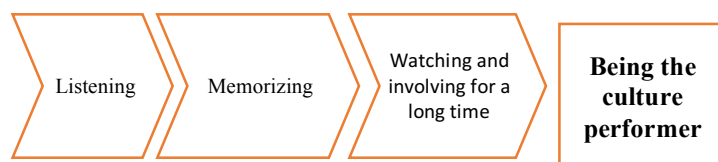
The behavior of traditional people do their custom since they have born make those things tightly stick in their mind and their life. Listening, memorizing, and watching the concrete evidences for long time is the pattern of building their believing as the traditional people and continuously try to keep their tradition and finally that tradition is acculturated and ingrained. Believe is subjective thought that an object or event has character or

such value [8]. Clearly, more sure people toward their believing so the bigger intensity of that believe. As well as the people believe in Kampung Pulo toward these tradition. In this condition there is nothing wrong since those things still related to the believing.

The function of a pattern which creates that tradition is as unifier that makes people relation inside the society more closely. The worries feeling of disaster coming and respect toward their ancestor actually are the value which is reflected on members' behavior demanded by culture being the evidence of their obedient toward tradition. Culture values usually come from philosophic issues which is part of culture base. These values generally is normative in the meaning of that these values be the reference for a member about what is bad and what is good, what is right and what is wrong, positive and negative, and so on. This tradition is mechanism to close and unifier the traditional member. It is because the symbolic interaction among people inside the society, where people create something which is agreed has meaning and only people there who can understand it.

In delivering those messages, of course the communication subject must have communicative competency in order each saying of him/her can be trusted and inherited continuously to next generation. The sacred things that is being the tradition usually delivered by a figure or wise people in each generation, for instance the key keeper who respected and obeyed because he is compatible and respected among the society and they explain those sacred thing like they were in that event. Therefore, this believes from generation to the generation very stick. The survival of this tradition indicated by the existence of the relation between the information sources since the past until today. Their generation are demanded to watch directly and follow anything which are done by their parents. Therefore, the communication sources among generation continuously correlated and make the tradition tighter.

The explanation above is appropriate with the scope of communication ethnography (Hymes) which talk about the pattern and function of communication, the ways of communication, the elements of communicative competence, and the relation of language with world and social organization point of view [2]. It is also related to the symbolic interaction concept where the essence of it is activities that being the human character that is communication or symbol exchange which give a meaning. This perspective suggest that human behavior must be seen as the process that give possibilities to human to create and manage their behavior by considerate others expectation as their interaction partner. The definition which is given by them to other people, the situation, the object, and even they themselves that decide human behavior [9].



Picture 2. The Model of Culture Inherited

V. CONCLUSION

1. According to the research result, in Kampung Pulo there are some local wisdom symbols which can be investigated the history and the developing of such symbols usage including:
 - (a) Banned to visit on Wednesday night Wednesday,
 - (b) banned to add or decrease the amount of main building/family leader,
 - (c) banned to strike the bronze big bell,
 - (d) banned to build prism/jure roof,
 - and (e) banned to keep animal with four legs.
2. In using those symbols people in Kampung Pulo not far from the wise word and story of karuhun (ancestor) and such aimed for their life in the future. Banned to visit on Wednesday night Wednesday means the tolerance among religious people by using that day to learn more about Islam, banned to strike the bronze big bell and build the prism/jure roof means to create comfort situation among the society and the environment in order to avoid the terrible disaster, prohibition of add or decrease the main building and family leader means the symbol of caring and responsibility. The last, prohibition of keeping four legs animal means to keep the soil and cemeteries from breaking.
3. Through this research, it can be described the communication patterns that impact on the survival of local wisdom to date. Listening, memorizing, watching and involving for a long time the disastrous linkage that befell the ban being broken into its own pattern of enduring traditions to date. The aim is to avoid the adverse events experienced in the past of his ancestors, as applicable normative value, in other words as a regulator of the mechanism of community life, as well as to preserve the culture that has been embedded since the first.

REFERENCES

- [1] Liliweri, Alo. 2003. Makna Budaya dalam Komunikasi Antarbudaya. Yogyakarta: Lkis.
- [2] Kuswarno, Engkus. 2008. Etnografi Komunikasi. Widya Padjadjaran.
- [3] West, R & Turner, L. 2007. Introducing Communication Theory: Analysis and Application. Jakarta: Penerbit Salemba Humanika.

- [4] Widyarini, N. 2009. Seri Psikologi Populer; Kunci Pengembangan Diri. Jakarta: PT Elex Media Komputindo.
- [5] Bungin, Burhan. 2011. Penelitian Kualitatif; Komunikasi, Ekonomi, Kebijakan Publik, dan Ilmu Sosial Lainnya. Jakarta: Kencana Prenada Media Group.
- [6] Morissan. 2013. Teori Komunikasi; Individu Hingga Massa. Jakarta: Kencana Prenadamedia Group.
- [7] Kusumohamidjodjo. 2009. Filsafat Kebudayaan; Proses Realisasi Manusia. Yogyakarta: JALASUTRA.
- [8] Mulyana, Deddy. 2007. Komunikasi Massa Suatu Pengantar Edisi Revisi. Bandung: Simbiosis Rekatama Media.
- [9] LittleJohn, S & Foss, K. 2009. Teori Komunikasi; Theories of Human Communication. Jakarta: Salemba Humanika.
- [10] Prijana. 2008. Tradisi Ngapulus Imah Di Kampoeng Pulo Kabupaten Garut Provinsi Jawa Barat. Padjadjaran University Journal.
- [11] Yohana, N & Husmiwati, K. 2015. Kaidah Interaksi Komunikasi Tradisi Lisan Basiacuang dalam Adat Perkawinan Melayu Kampar Riau. Communication Science Journal. Vol. 18 No. 01, Juli 2015: 43-56
- [12] Efener. 2012. Masyarakat Adat Kampung Pulo. Web: <http://www.disparbud.jabarprov.go.id/wisata/dest-det.php?id=28&lang=id>. Accessed on Thursday, 2 Feb 2017. 13.26 WIB.

An Assessment Agrarian Conflict Dynamics and Conflict Resolution Practices in Central Borneo

Agustiyara

Jusuf Kalla School of Government (JKSG), Department of Public Administration, Khon Kaen University

E-mail: agustiyara@gmail.com

ABSTRACT

The aim of this article is to introduce the factors of agrarian conflict and resolution practices in Central Borneo Province. Central Borneo is the highest of agrarian conflict sectors with 87% oil palm plantation owned by the company, and smallholder's only 13% of oil palm plantation belonging to independent smallholders. Conflict over the land and natural resources issues are often found among various factors and involved diverse parties. It could include members of households, families, ethnic groups, governments, and the agencies or other actors such as investors or corporations. Agrarian conflicts in general caused by two things. Firstly, the inequality of land tenure. Secondly, the countries and corporations that have control over the land that is dominant rather than the control of society in rural areas who lives in under poverty line. Therefore, the hypothesis is discussed by requires balancing between access to use forest and sustainability ways. Imbalance of planting oil palm industry has resulted in the degradation of forest and environment. Furthermore, this study will use the term of "best practice" in analyzing dispute and conflict resolution of oil palm plantation in a sustainable way. In one hand, oil palm plantation to increase the productivity, on the other hand decreasing dispute on the local community and company in Central Borneo. The analysis will significantly contribute to the development of conflict resolution practices on the governmental studies, particularly on dealing conflict natural resource of oil palm plantation. The methodology of this research uses qualitative method with the explanatory approach. Data collection technique used in term of library research by collecting data from the books, academic journal, article and other sources that relevant with this research.

Keywords: Natural resource, Policy, Resolution Practices.

I. INTRODUCTION

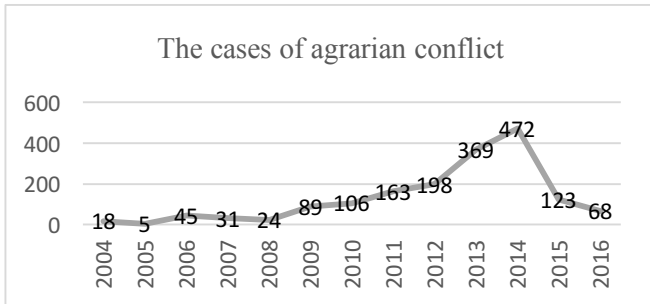
Conflict over the land and natural resources issues are often found among various factors. Land conflicts are involved various parties. It could include members of households, families, clans or ethnic groups, governments, and the agencies or other actors such as investors or corporations [1]. The conflict over land in Indonesia usually arises between indigenous communities, Industries and the state [2]. Land tenure arrangements have undoubtedly influenced the way in which natural resources are controlled by the state and indigenous communities in Indonesia [3]. The term of land tenure means a set of rights which include the right to access, right to use, right to manage, exclusion, and divert. Access refers to the right to enter certain areas. Usage or utilization means the right to obtain resources from the forest [4]. The explanation indicates that research on agrarian and conflict analysis is necessary to determine the cause of the agrarian conflicts and conflict resolution practices.

The increasing of agrarian conflicts required the agrarian reform, conflicts caused by inequality of ownership, control, and management of agrarian resources or inequality of the agrarian structure. The agrarian conflicts are a) Chronic, massive and widespread, legal, social, political and economic. b) Structural agrarian conflict, government policy on land

use and natural resources management. c) Permit of land use and natural resource management. d) Human rights abuses [5]. Land access regulated through a system of land ownership. Land tenure is a legal aspect or relations between indigenous people as individuals or groups associated with the land [6]. According to the Centre for International Forestry Research (CIFOR), it is stated that Indonesia needs to have a conflict resolution, in resolving land conflicts. Therefore, the business development that utilizes the large land plantations has great potential overlap to the community land and forest area. The cases of agrarian conflict that occurs including inequality of ownership, control, and management of agrarian resources (inequality of the agrarian structure) become a major problem unresolved even last ten years.

Agrarian disputes cause the loss of social welfare, property, and live hoods. The dispute also interferes the performance of government and industrial efforts, especially in the local government (provincial and district levels), the impact is not directly to the indigenous peoples and the local community, but the local and national levels and industry [7].

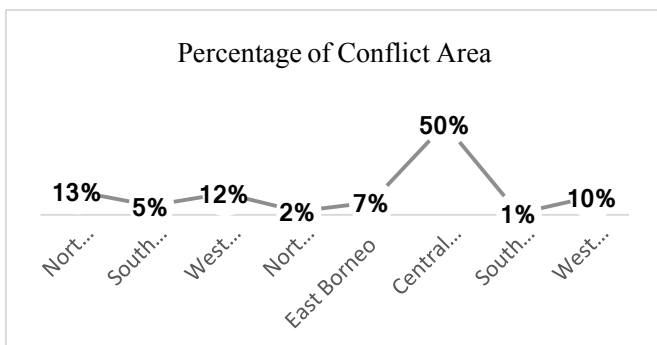
Figure 1 The Agrarian Conflict cases in Central Borneo During 2012 to 2016



Sources: KPA (Consortium for Agrarian Reform) and BPHN 2015

The rapid expansion of oil palm in some area of Indonesia, especially in Central Borneo can contribute to deforestation, peat degradation, biodiversity loss and burning and slash of forest area, but oil palm became the major contribution to economic growth for regional government income. In 2012, roughly 11 million hectares were planted with oil palm plantation [8]. Most of the oil palm were in Sumatra (64%) of oil palm plantation and followed by Borneo with (31%) of oil palm plantation. The unsustainable expansion of oil palm plantation damaged forest area, wildlife, and the environment. Most of the palm oil industry had a land dispute with land communities.

Figure 2 The Agrarian Conflict Area



Source: HUMAWIN REPORT, 2015

The high numbers of conflict that occurs in Central Borneo are interesting to choose Central Borneo as a research area in 2015, In this case. It is noted that the government plays roles in resolving conflicts in Central Borneo. Conflict resolution between society and company becomes a challenge for any stakeholders, the interest of certain parties in the protected conflicts. The conflict which occurs in Central Borneo describes that

the conflict could not be resolved especially in the case of conflict between society and company. There are many terms of land tenure and land tenancy. Land tenure means the legal status such as ownership rights and land tenancy that people who as owner, occupy and land use. It is undeniable that many conflicts between society and companies based on authority, and perceived divergence of interest. In order to describe the issue, this research will utilize the secondary data and this study will analysis the conflict resolution between society and company in the context of ownership.

There are three reasons why the research on agrarian conflicts in this study becomes important, which are: first, the increasing of agrarian conflict cases in various years. Second, Central Borneo is the highest number of agrarian conflicts. Third, conflict and resolution practices are involved various parties. Therefore, this research will discuss how the settlement of conflicts in Central Borneo could be completed in case of conflict resolution in Central Borneo.

The Objectives of this research are: To study on the conflict dynamics of agrarian issues and conflict resolution practices in Central Borneo.

II. THEORETICAL FRAMEWORK

Theoretically, the scientists defined agrarian conflicts in different understanding, depends on the perspective. According to [9] states that the conflict is a process of interaction between two or groups in getting the interest of the same object. Limbong sociologically argues that conflict is a social interaction between two or groups where one party trying to get rid of the other parties [10].

1. The Cause of Conflict,

Soetrisno (2003) says that there are several causes of conflict in various forms that are: *Conflict objectives*; A conflict may occur due to the differences of the purpose of the system. In a social system, there is a faction, a group that has a purpose and a different mindset. Each group has purpose accordance with the purpose which they are formulated, and this can lead to conflict. *Resource of conflicts*; the organizations require human resources, money, materials, and machines to execute the activity. Organizations must compete on the limited resources. Competition for these resources could lead to the conflict. *Conflict of powers*; one of the influences of groups in a building up social power is leadership influence. Leadership is the process of

influence while power is the potential to influence and authority to act. Without power, it's hard to influence others and policies often lead to the conflict. *Conflict of Culture*; Conflicts can occur in the aspect of culture, ethnic background, education, experience, gender, etc. This diversity raises the differences of mindset, behavior, and communication. The diversity can lead to conflict, both within communities, organizations, and governments [11].

2. Agrarian conflicts

Agrarian conflict, as stated by Christodoulou, is "Agrarian reform is the offspring of agrarian conflict" [12]. Agrarian reform is the agrarian conflict. It means that it come up from the reformation of ownership/land control and known as the "land reform" which is developed into "agrarian reform" is a response toward the conflict situation on land issues. Therefore, to understand about agrarian reform, the problem of agrarian conflict should be understood [9]. According to [27] divide three types of conflicts causes of land ownership. The main of the conflict causes are:

First, Politics factors. Almost every conflict occurs on land ownership. The potential to become a conflict when there is a big changes (which are really happening or presumed exits) land tenure.

Second, Legal aspects. Many land tenure conflict occurs cause of several problems. The main problem is that some actors do not know the legal rights, unknowing about the legal framework that governs access to some areas and utilizes of natural resources in a manner opposite to each other. The organizations on the legal authority to set the same area can also cause the land tenure conflicts.

Third, Economic factors. The land is a source of income and a natural resource for grabs are involved in the conflict, and they are ready to do anything to maintain their positions.

As a social phenomenon agrarian conflict is a when process of the interaction between two or more people or groups which pursuit of the interest with the same object, namely, land or other objects related to land, water, plants, etc. but when they opposed each other there was a conflict situation [9]. The source of agrarian conflict is basically because of the imbalances and incompatibilities of land status[12].

3. Conflict Resolution

According to [9] there are several approaches in dealing with conflicts that are: *First*, to avoid the conflict, being uncooperative and unassertive, withdraw from the developing situation, and or neutral in all

conditions. *Second*, authoritative, being uncooperative, but assertive, against the wishes of other parties, struggle to dominate in a situation of "win or lose", by using existing powers. *Third*, leveling, let the other party wishes to stand out, leveling the differences in order to maintain the harmony created artificially. *Forth*, Compromise, be cooperative and assertive, not at extreme levels. Working towards a partial interest of all parties concerned, implementing bargaining efforts to achieve solutions, nobody feels that he won or lost absolutely, and *five*, problem solving, be cooperative and assertive, trying to achieve the satisfaction of any interested party, through differences that exist, solve the problems that everyone achieves advantages as a result.

Based on the theory it can be concluded that the conflict may occur among individuals in organization, institutions and community. It is considered to be endemic to all social relations and could be understood as a conflict about legitimacy and authority in any organization, roles, and positions, by using the perspective of [12].

III. METHODOLOGY

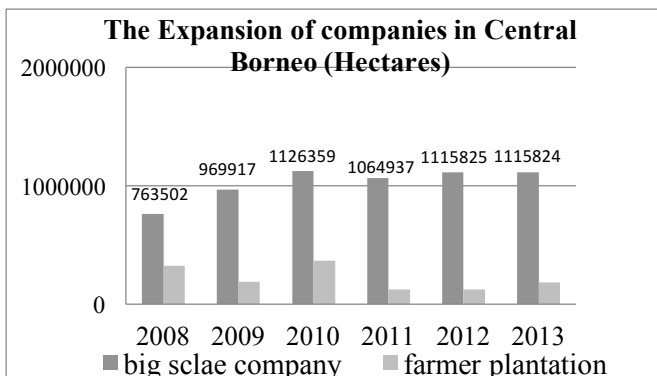
Qualitative method is the primary method in this research which used to find out and analyzed the data. Qualitative research involves the studied use and collection of a variety of empirical materials case study, personal experience, observation and describes the problematic moments [13]. The research conducted is included the category of library research. Moreover, the Data collection technique used by collecting various journal articles, documents, books that related to the agrarian conflict. It is useful to examine the dynamic of agrarian conflict over the land, reflects an attempt to secure an in-depth understanding of the land dispute phenomenon in question [14]. In this research, the researchers used explanatory qualitative research approach, focused on analyses the agrarian conflict in Central Borneo. The problems of this research were related to the dynamic of the agrarian conflict. In order to describe the issue, this research will utilize the secondary data and analysis the conflict resolution practice based on best practice. Data collection is done by describing the data to understand what is happening based on the data that has been presented [15]. The conclusion from the entire data of each variable by comparing the data obtained from the various sources to see the possible variations that occur, based on findings could be concluded into the conclusions. This research located in Central Borneo, it's one of the highest

expansion areas for palm oil plantation and the numbers of agrarian conflict cases.

IV. RESULT AND ANALYSIS

Indonesia has recently become the biggest producer of oil palm in the world, with over six million hectares of oil palm plantations that can produce over 17 million tons of crude oil palm (CPO) [16]. The demand for oil palm on the global market has encouraged the Indonesia government to stimulate the expansion of oil palm plantation. Many facilities and incentives have been given to private investor to invest the sectors. While the policies that protect local communities and environment are lacking [17]. The investors cover more than seven million hectares and are managed by more than 600 companies and one million small farmers.

Figure 3 The Numbers of plantation area in Central Borneo



The emerging of companies began from Mega Oil Palm Projects and the new focus of development plants after the fall of Soeharto in 1998. Under Soeharto era, the area had been allocated to military controlled logging concessions, reflecting both the importance of the timber industry and security concerns. The first plans to develop the area with oil palm were drawn up under Megawati in West Borneo for the expansion area. Under Susilo Bambang Yudhoyono, Central Borneo is an expansion area as oil palm corridor.

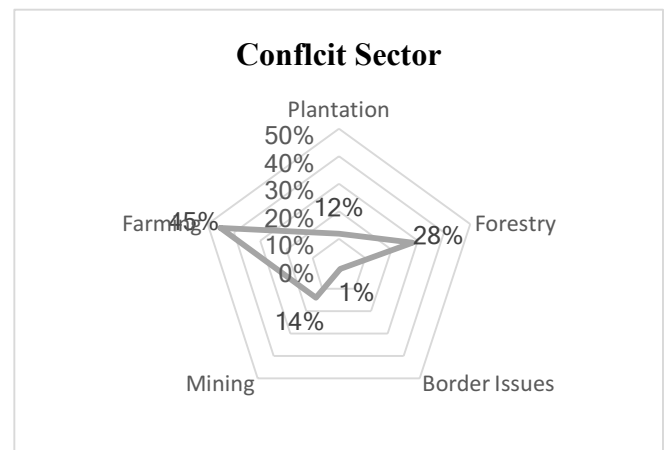
Industrial forest plantations are expected to expand dramatically to meet the demands of the needs, food, and energy in the future, the expansion of plantations occur on a large scale which reaches five million hectares per year globally [18]. Master plan acceleration and expansion of Indonesia's economic development (MP3EI) 2011-2025 assert that the economic corridors are designed to produce a particular global commodity.

The Borneo corridor became the center of production and processing of mining products and the national energy sector with the focus on oil, gas, oil palm and coal. According to [23] Rachman, the stakeholders to understand how the acceleration and expansion of global commodity production in the term of plantation concessions, forestry and mining became the main establishment of the three fundamental problems, that is the damage to the environment, the distribution of land tenure and natural resources are lame, and the occurrence of agrarian conflicts.

The increasing of oil palm plantation in Central Borneo has started since 1994 until 2014. It shows that the conflict frequency every year which reaches the highest cases of agrarian conflict, the expansion of plantation build up the social conflict between community and company in term of land tenure. The causes include the local people felt the injustice related to large-scale forest management system which causes community access to the forest resource is limited.

According to [19] states that the widespread expansion of monoculture plantations such as oil palm in Borneo reduces forest area drastically. The development of oil palm plantation sector investment is alleged to strengthen the pressure on land needs and the most vulnerable which are the forests. A massive plantation conflict that occurs indirectly is triggered by the government ambition to make oil palm as primary commodities in Indonesia. It's considered as business community of oil palm sector to get protection from the local government is also involved in facilitating the ownership and oil palm plantation operation in region with economic and political considerations of short-term planning [20].

Figure 4 Conflict sectors in Central Borneo



Sources: Central Bureau of Statistics, 2013.

Conflicts over natural resources and agrarian in general caused by two things. *First*, the inequality of land tenure (overlapping of land tenure), countries and corporations that have control over the land that is dominant rather than the control of society in rural areas who lives in under poverty line. The data of Consortium for Agrarian Reform (KPA) asserts that about 64.2 million hectares or 33.7 percent of land in Indonesia used by forestry companies, mining, gas, minerals, and coal in the form of concessions (Rachman, 2014) and the implementation of REED+ by the government still questioned.

The second, cause of the agrarian conflicts are differences between the systems of land tenure in the agrarian conflict is uncertainty. Society adamant tenure is hereditary and informal while the company and the other actors come up with the formal system which is unknown in society [21] the root of natural resource and agrarian conflict usually stems from inequality of land tenure and natural resource. Inequality of tenure due land grabbing of the right and over control of the land and natural resource, the control over the land are dominant. Meanwhile, the other party is eroded by power. The power can lead to intense of conflict that occurred [20]. The main impact of various interpretations the policies that are the conflict occurs and dispute claims over the land ownership between communities and companies [22].

Central Borneo Province is the highest of agrarian conflict and natural resource based on the HUMA data and the partners [20]. The expansion of oil palm in Central Borneo (doubled during the last ten years) which is spurred economic growth in Central Borneo, but has caused a loss of social and environmental significantly. However, the local Parliament of Central Borneo province issued the regulation years 2011 on Management of Plantation Sustainable Business [8].

In other local government about the case of agrarian conflict that occurs, in Central Sulawesi, the competition in securing access to the land in the context of migration of people and changing the pattern of land ownership which caused a conflict between indigenous people and migrants people [24]. The same causes of agrarian conflict are also found in Maluku, many migrants of Javanese and Bugis get more profit and privilege during Suharto era to access the natural resource, its caused the indigenous people even begrudge them [25]. In Papua, the power and arrangement by the government were reported as the cause of conflict [26]. Besides, the comparison help to understand the dynamic of natural resources controlled,

regulated and divided, and how various actors could access and land use of natural resources, and the causes of conflict that occurs in any provinces.

In Kapuas District of Central Borneo Province which documented by *Yayasan Petak Danum* (Local community) (HUMA, 2014), it is asserted that is around 7.000 territories of indigenous people Sei Ahaz and several villages included in palm oil plantation by the company. This region is the new status of non-forest areas which decree by Ministry of Forestry No. 529/Ministry of Forestry II/2012 regarding the amendment of forest area become the non-forest area in Central Borneo. The explanation above shows the importance assessment of conflict between communities and companies. Besides, the local government policy to give permits for palm oil plantation and mining company not only caused by the problems and changes in the system of land tenure, but also opposed to national policy and decision to preserve and protect land use [24].

The procedure for land settlement and post-conflict management, Settlement legally or by placing a formal law as main points, mostly deadlocked and not proportional to the costs which incurred by each party involved (both the plantation of community and company), complicated situation to find out the point of conflict resolution, moreover, the cases which involving many parties will uncounted costs.

The conflict resolution mechanism has been established through Governor's Decision No. 188.44/108/2012 concerning a mechanism to prevent, handle and resolve conflicts related to plantation businesses. Land conflicts and causes have been identified (Earth Innovation Institute, 2015). Based on Central Borneo Governor Decree No. 188.44 / 335/2010 on the Formation Team Prevention, Control, Management and Business Interruption Settlement of Plantation in Central Borneo province. Central Borneo has published the Governor Regulation No. 42/2014 concerning management and conflict resolution plantation business in Central Borneo province. In 2010 approximately 12 years after the agrarian conflict began, the uncertainty of legal, the citizens are entitled to claim the former plantation land, and the company also felt entitled to the land. The community will win on the field, but the company will win on legal, the position of the State, in this case, the national land agency (BPN) is silent. The Supreme Court decision for the execution is to deal with the citizens and plantation actors. All parties do not desire this situation to the

dispute, is the need for ensuring legal certainty for all sides to get legal justice.

Dispute resolution mechanisms developed by the Regional Government, both the Provincial Government and District Government (in this case is the Kapuas district), [7] dispute settlement mechanisms of agencies, Such as the Department of Plantations, and the Dispute Settlement Mechanism by the regional and national land agency office. Governor regulates the indigenous land and community's rights on land, and provincial level regulation on sustainable oil palm as follow: first, the rights of local communities, especially for customary or traditional land claims. Second, a responsibility of the company to comprehend the indigenous land claims and invest in job creation locally supports for small farmers and build the diverse local economy.

According to UNDP, there are five important stages in best practice conflict. The first: Grievance: the existence of natural resource related issues or claims by one part of society against another. Grievances are common in many societies. A grievance is an issue, concern or claim perceived which held by one party against another party.

Second, insecurity: when one or more groups perceive their interests or community to be under threat. In a context of insecurity, there is often a growing recognition of the potential for land grievances to become violent, at this stage, land dispute management efforts should focus on addressing land-related grievances as part of a comprehensive conflict prevention strategy.

Third, conflict: the transformation of grievance into violent conflict and the evolution of that conflict over time. Forth, negotiation and Peacemaking: attempts to transform the conflict from one characterized by violence to a non-violent path and resolution.

In practice, the rights of rural populations are often ignored despite the recognition of rural land tenure rights by national regulations. Several technical issues currently preventing the recognition of rural land tenure are:

Clear evidence, such as a map, will be required to obtain formal recognition of land. Developing a map of traditional or customary land tenure. However, it's challenging, the boundaries of customary claims between individuals or groups are usually marked by natural features such as a stone, trees, a river or certain plants. As communities are no longer ethnically

homogeneous, the natural boundaries are no longer effective.

The consultant company that won the bid for executing the national program on land certification does not understand the complexities of land tenure claims in Central Borneo.

The research institutes such as the Centre for International Forestry Research (CIFOR) have used community mapping techniques to document and facilitate local conflict resolution mechanisms.

V. CONCLUSION

The increasing numbers of agrarian conflict in Central Borneo are caused by inequality of ownership (overlapping of ownership), spatial planning of forestry area and inequality of agrarian resources management. The agrarian conflict that occurred in Central Borneo is one of expansion result of oil palm plantation. The impacts of oil palm plantation are indigenous land disputes between the community with company owners over the land community and forest area and land grabbing land needs. Oil palm plantation is the potential in term of economic growth, and it could provide job opportunity to the local community and provides the income resource for local government. However, the consequences of the increase of palm oil companies are the number of agrarian conflicts, forest degradation, and environmental impact.

Furthermore, the government of Central Borneo Province roles to deal wiht the conflict resolution, the procedure for land settlement and post-conflict resolution are, *first*, the extension of management area between community and company, which accelerate the conflict resolution process and prevent the rise of new conflicts. *Second*, improved land use practices and legal framework and practices of spatial planning and forest arrangements. *Third*, improved transparency and regulatory changes, *fourth*, conflict resolution through the courts and mediation and Five, community involvement in the decision-making process through *Musrenbang* (discussion forum) and socialization forum.

REFERENCES

- [1] UNDP. "Toolkit and Guidance for Preventing and Managing Land and Natural Resources conflict." 2012: 30-45.
- [2] Ruwastuti, Maria Rita. *Sesat Pikir "Politik Hukum Agraria, Membakar Alas Penguasaan Negara Atas Hak Hak Adat, Noer Fuazi (Peny). Yogyakarta: Insist Press, KPA dan Pustaka Pelajar, 2000.*
- [3] Denny, K. "Community Mapping, Tenurial Rights and Conflict Resolution in Kalimantan." 2006: 5-25.
- [4] Schlager, E, and Elinor Ostrom. "Property-Rights Regimes and Natural Resources: A Conceptual Analysis." *Land Economics*, Vol. 68, No. 3, 1992: 249-262.
- [5] WALHI. *Penyelesaian Konflik Agraria Wajib Jadi Prioritas Jokowi-JK*. 09 09 2014. WALHI. (2014, 09 09). Retrieved 10 14, 2015, <http://www.walhi.or.id/penyelesaian-konflik-agraria-wajib-jadi-prioritas-jokowi-jk.html> (accessed 06 01, 2017).
- [6] Galudra, Gamma, Meine van Noordwijk, Putra Agung, Suyanto Suyanto, and Ujjwal Pradhan. "Migrants, land markets and carbon emissions in Jambi, Indonesia: Land tenure change and the prospect of emission reduction." *Mitig Adapt Strateg Glob Change*, 2014.
- [7] Zakaria, R. Yando, et al. "Mekanisme Penyelesaian Konflik Agraria, Alternatif Lokal di Tengah Kemandegan Inisiatif Nasional." 2015: 6-26.
- [8] CIFOR. "Social impacts of oil palm in Indonesia; A gendered perspective from West Kalimantan." CIFOR, 2015: 4-54.
- [9] Lucas, Anton, and Carol Warren. "Land for the People: The State and Agrarian Conflict in Indonesia." *Research in International Studies, Southeast Asia Series*, 2013: 408.
- [10] Limbong, Bernhard. *Konflik pertanahan*. Jakarta Selatan: Margaretha Pustaka, 2012.
- [11] Soetrisno, Loekman. *Konflik sosial: studi kasus Indonesia*. Indonesia: Tajidu Press, 2003
- [12] Christodoulou, Demetrios. *The unpromised land: agrarian reform and conflict worldwide*. Zed Books, 1990.
- [13] Denzin, Norman K. *Handbook of Qualitative Research*. London: Sage Publication Inc, 2000.
- [14] Flick, Uwe. *An Introduction to Qualitative Research*. SAGE Publications, 2000.
- [15] Taylor, Steven J, and Robert Bogdan. *Introduction to qualitative research methods: the search for meanings*. 2007.
- [16] Pye, Oliver. "The palm oil controversy in Southeast Asia: A transnational perspective." 2013.
- [17] Deddy, k. "Community Mapping, Tenurial Rights and Conflict Resolution in Kalimantan." 2006: 5-25.
- [18] FAO. "Governance, Decentralisation and Deforestation: The Case of Central Kalimantan Province, Indonesia." *Quarterly Journal of International Agriculture* 54 No. 1, 2015: 77-100
- [19] Widiyanto. "Potret Konflik Agraria di Indon." *BHUMI, Journal Ilmiah Pertanahan PPPM-PTPN*, No 33, 2013: 15-26.
- [20] HUMA. *Outlook Konflik Sumberdaya Alam dan Agraria 2012*. 03 21, 2014. <http://huma.or.id/pusat-database-dan-informasi/outlook-konflik-sumberdaya-alam-dan-agraria-2012-3.html> (accessed 04 29, 2017).
- [21] Warren, C, and A Lucas. "Land For the People, The State and Agrarian Conflict in Indonesia." *Southeast Asia Series No. 126*, 2002: 1-10.
- [22] Safitri, M. A. "Towards Certainty and Justice in Tenure, The views of the Indonesian civil society groups concerning the principles, prerequisites and measures in reforming the policies on the control of land forest zones in Indonesia." 2011: 9-24.
- [23] Rachman, N. F. "Mengapa Konflik-Konflik Agraria Terus-Menerus Meletus Di Sana-Sini?" *Working Paper Sajogyo Institute No.1*, 2014: 7-26.
- [24] Anomie, and Violence. "West Kalimantan and Central Kalimantan." 2010: 321-334.
- [25] Chauvel, and Bhakti. "Dynamics of Conflict and Displacement in Papua, Indonesia." *RSC Working Paper No. 42*, 2004.
- [26] Brown, J.H, Morgan Ernest S.K , Parody J.M, and Haskell J.P. "Regulation of diversity: maintenance of species richness in changing environments." *Oecologia* 126, 2001: 321-332.
- [27] Herrera, Adriana, and Maria Guglielma da Passano. "Land tenure alternative conflict management." *Food and Agriculture Organization of the United Nations*, 2006.

The Use of Verbal Rhetorical Devices to Construct Readers' Ideology in Online News Headlines

Annisa Laura Maretha, Allan Kongthai

School of Liberal Arts
Mae Fah Luang University
Chiangrai, Thailand

5851006257@lamduan.mfu.ac.th ; allan.kon@mfu.ac.th

ABSTRACT

Headline editorials have their merit to create inventive language choices to meet a targeted discourse. This paper serves as an understanding on how news discourse can be elaborated by taking both meaning and effects of language use in the production and interpretation of a text into account. Gathering the key instrument from 139 relevant online news headlines under the discourse of *Gerwani*, a debarred women's organization in Indonesia's New Order regime from various online news websites publication year 1999-2016, this research aims to: 1) identify verbal rhetorical devices (alliteration, parallelism, testimonial, metonymy, irony, quotation out of context, rhetorical question, and antithesis) used in the headlines, and 2) elaborate the use of verbal rhetoric devices and how they serve the readers with persuasive manner toward their ideology, including beliefs, opinions, and value systems, regarding with *Gerwani*-related case. The analysis proved that the use of verbal rhetorical devices in online news headlines contributed to create relevance of the topic, thus, aided the readers to perceive intended meaning, which might influence the establishment of power to construct their ideology. Consequently, the use of language can never be separated in socio-cultural contexts of a particular society, driving a persuaded manner for headline-oriented and language practitioners to notice how important it is to use verbal rhetorical devices as one of incorporating attitudes in delivering messages in public sphere ensuring a variety of contents and contexts to be perceived.

Keywords : online headlines, verbal rhetoric devices, Gerwani, ideology, discourse

I. INTRODUCTION

In the changing period of communication medium, headlines are still considered as an important key point to access news. In fact, as headlines are also a part of language texts, they share communicatively various intentions, such as to inform, to entertain, to persuade, to educate, and many others. Isani [1] classifies three functions of news headlines, which include a function on a surface level; how the production of headlines are to meet the visual level of columns, place, text design, font size, and many others to be eye-catching, on a linguistic level; how headlines generally serve economy grammar in their textuality, and on a pragmatic level; how headlines act as way to level up relevance, negotiate body texts, select or even summarize the news.

Under linguistic context, the researchers explored the use of linguistic cues as Luow [2] identified that they allow headlines to influence readers' interpretation. Johnstone [3] also asserted that headlines become a part of information that is skillfully shown in micro-rhetorical linguistic choices, in which Metila [4] also pointed out that if they are added with subtle structural and linguistic elements, headlines might sway readers in forming opinions or interpretations. Long & Wall [5] mentioned that one of rhetorical media tools and techniques that can be used in media communication is

the use of verbal rhetoric devices. Verbal rhetorical devices are a part of rhetoric which concern not only about the messages delivered but also about the determination of how persuasive a text can be [6][7]. They include alliteration, parallelism, testimonial, metonymy, irony, quotation out of context, rhetorical question, and antithesis [5][8][9][10].

Alliteration is the repetition of starting letters of words in a phrase or sentence to create affective rhythm. Parallelism refers to the use of the same pattern of words and structures which is created under the same class of the words, nouns, or noun phrases. Meanwhile, testimonial is a rhetorical device that uses testimonies from a person or institution to endorse its related description towards the news story to convince the readers. Subsequently, metonymy is a word, name, or expression used as a substitute for something else with which it is closely associated, used to represent a part as a whole or a whole for a part. Thenceforth, irony is a statement or expression of one's meaning by using language that normally signifies the opposite, typically for humorous or emphatic effect; include the use of sarcasm, cynicism, and mockery. Quotation out of context denotes a statement or expression used that removes the most important quotes from the context and

editorial. A rhetorical question is an expression or utterance in the form of a question that is asked to make a point rather than to prompt an answer, for a stylistic effect with the purpose of emphasizing or provoking. Lastly, antithesis is a figure of speech in which an opposition or contrast idea is expressed by parallelism of words that are strongly the opposite of or contrasted with.

This research was conducted under a pragmatic goal to investigate how language and discourse are always intertwined with socio-political agendas reflecting ideologies as MacRitchie & Seedat [11] mentioned that the use of verbal rhetorical devices may optimize the relevance of the news as they can relate the contextual effect and processing effort by looking at a distinct layout and typography that also present a specific version of truth, reality or world order.

Research objectives:

1. to identify the verbal rhetoric devices used in *Gerwani*-related online news headlines publication year 1999-2016.
2. to reveal the relationship between the verbal rhetoric devices and headlines, and how the verbal rhetoric devices serve the readers with persuasive manner toward the readers' ideology, including their beliefs, opinions, and value systems, regarding with *Gerwani*-related case

I. LITERATURE REVIEW

Headline editorials have rights to create a manipulation of words to ensure that a specific discourse can be maintained. Thus, Simpson & Mayr [12] described that there is no text that is neutral because in discourse, every text carries a specific meaning which is bias, because each has its ideological standpoint. This paper serves as an understanding on how discourse itself can be elaborated by taking both meaning and effects of language use (by investigating the use of verbal rhetorical devices) in the production and interpretation of a text into account (how the texts can be perceived). Verbal rhetorical devices in the headlines themselves offer newspaper editorials to explore their persuasive manner using linguistic devices used in words or phrases that may contribute to influence the readers' ideology to believe so or otherwise [10]. They are words or phrases that can be used to manipulate readers in some cases [13]. Thus, it is believed that they contribute towards the establishment of power as a significant persuasion device to construct the readers' attitudes, beliefs, thoughts, in this case by the media cultivation, e.g. from

139 selected online news headlines in the case of *Gerwani*.

Gerwani is an activist-based movement that makes its move towards a mass women organization to attract wider scope of Indonesian's women, focusing on women's rights in education, marriage law, labor's rights, prostitution banning, and political rights [14][15]. Its members were claimed to take active involvement during the 1965 coup in 30 September 1965 and to murder six army generals [16], which then they were also arrested and imprisoned without trial. This event also remarked as Indonesia's governmental power transition period from President Soekarno (Old Order regime) to President Soeharto (New Order regime) [17].

During the New Order regime (1966-1998), *Gerwani* was believed to misrepresent the nature of Indonesian women. It was claimed that *Gerwani* had performed sadistic and sexual rituals before and after killing the six Generals during G30S [18]. *Gerwani* was recognized as a threat to the "idealized Indonesian identity" [19] in the New Order regime, as women should be referred as obedient housewives and passive political participants, in which *Gerwani* opposed to that the misogynous propaganda.

The traditional beliefs of Indonesian's women's role were made by the New Order regime to fit in with the power interests of the state in which *Gerwani* noticed this state of inequality. Since the reproduction of all state-controlled media over *Gerwani* and its associated institutions such as the Indonesian Communist Party, the ex-*Gerwani* members were not easily accepted by the society even after being discharged. Until today, the majority of Indonesian society believes that they are a part of leftists and thus, it leads them to be systematically discriminated.

I. METHODOLOGY

The selection of the data was based on three considerations: 1) the data were purposively taken under a special case of Indonesian's unresolved human rights issue that has been highlighted internationally, 2) they are all available to be accessed online by Indonesian and international readers, and 3) this type of editorials usually brings about a particular ideological stance, thus the intertwined context of language use and discourse can be investigated. This research focused on *Gerwani*, stood for *Gerakan Wanita Indonesia*, or Indonesian Women's Movement, a massive women organisation established in 1950 as *Gerwis* (*Gerakan Wanita Indonesia Sedar*, or Movement of Conscious Indonesian

Women) that changed its name to *Gerwani* in 1954 [15]. Suspected and then claimed to be under the same line with PKI (*Partai Komunis Indonesia*, or Indonesian Communist Party), the New Order government banned the organization and arrested the members to be put into prison without trials[20].

The data were collected from 14 online news websites (*the Jakarta Post*, *Jakarta Globe*, *the Guardian*, *the Diplomat*, *Aljazeera*, *The Conversation*, *News Mandala*, *The International People's Tribunal (IPT) 1965*, *Inside Indonesia*, *NYR Daily*, *Foreign Policy*, *Tempo*, *Green Left Weekly*, and *Pacific Media Center*) publishing year 1999-2016, compiling 139 headlines in total. The keywords used to search for the news headlines were, such as “*Gerwani*”, “women organization 1965”, “1965 genocide”, “1965 mass killing”, and other related terms. The research object was in accordance to any news that the headlines or body structures contain a word “*Gerwani*”, “women organization in 1965”, “communist women” and similar references.

Employing a basic data sheet, the researchers did the following in their data collection: 1) retrieving the online news headlines, 2) reading them, 3) preparing a data sheet, 4) identifying the verbal rhetorical devices employed, and 5) transferring the data to the data sheet. In data analysis process, the researchers 1) read and re-read the online news headlines, 2) selected them as raw data, 3) classified the data into raw data to be categorized based on the data sheet, 4) categorized the kinds of verbal rhetorical devices, and 5) analyzed the tendency of the verbal rhetorical devices employed in an in-depth analysis.

Triangulation was employed in this research to conform key informants, data observation, and peer scrutiny ensuring the result reflected the experience of the key informants. In the case of reliability and dependability, this research employed clear research methodology to show that if the work were repeated under the same context, methods and key informants, similar results would be obtained [21].

II. FINDINGS & DISCUSSION

The researchers see the needs of reviewing linguistic cues that allow headlines to influence readers' interpretation, which shall be shown by what Johnstone [3] mentioned as micro-rhetorical linguistic choices. Below is the table showing the deployment of rhetorical devices that the editorials from various online news headlines chose to represent the meaning from *Gerwani*-related case during 1999-2016 that can be used as one of the strategies to influence public.

A. THE CLASSIFICATION OF RHETORICAL DEVICES USED IN GERWANI-RELATED ONLINE NEWS HEADLINES

| Rhetorical devices | Frequency | % |
|--------------------------|------------|------------|
| Metonymy | 52 | 37,41 |
| Literal meaning | 32 | 23,02 |
| Parallelism | 15 | 10,79 |
| Alliteration | 12 | 8,63 |
| Testimonial | 10 | 7,19 |
| Rhetorical question | 9 | 6,47 |
| Antithesis | 5 | 3,60 |
| Irony | 2 | 1,44 |
| Quotation out of context | 2 | 1,44 |
| Total | 139 | 100 |

The result shows a great deal of how rhetorical devices majorly help the readers focus at the attitude of the headline editorial, which, becomes the main aim at influencing and shaping the readers' understanding upon the case of *Gerwani*. Out of 139 headlines, 106 headlines employed the use of rhetorical devices ranging from the most performed rhetorical device: a) metonymy in 52 occurrences, b) parallelism in 15 happenings, c) alliteration in 12 occurrences, d) testimonial in 10 happenings, following next e) rhetorical question in 9 occurrences, with the least performed rhetorical devices from antithesis, irony, and quotation out of context with the order of occurrences for 5, 2, and 2 times. Meanwhile, the headlines that do not perform any rhetorical devices happened for 32 occurrences, which the editorial chose not to use any rhetorical device to ensure the literal meaning is received well by the readers instead of using the stylistic figurative speech which might be confusing for them, in terms of the message. However, 106 headlines that performed the rhetorical headlines did not make the readers confused, instead, they invited the readers' curiosity to read more and search for their intended meaning. Based on the distributions of rhetorical devices in *Gerwani*-related news headlines, there are 8 rhetorical devices. They are metonymy, quotation out of text, rhetorical question, alliteration, parallelism, testimonial, irony, and antithesis. Based on the occurrences employed from the previous distribution, the researchers proceeded to elaborate them in order of occurrences.

A. Metonymy

The occurrences of metonymy is mostly representing a whole for a part, intended to create bigger magnitude of representation so that the consequence of receiving the news is impactful. The examples can be seen below:

1. RI exiles wish dearly to return
(RI (the Republic of Indonesia) exiles : ex-
Gerwani members and their affiliated
institution)

(*The Jakarta Post*, 26 April 2006)

2. Indonesia Should Heed Verdict From International People's Tribunal Over 1965- 1966 Mass Killings

(Indonesia: Indonesia government)

(*Jakarta Globe*, 28 July 2016)

There is one example of headlines exemplifying metonymy that represents a part as a whole as in the following:

1. PKI properties revisited (PKI properties: PKI and its affiliated institutions, including *Gerwani* and Lekra¹)

(*The Jakarta Post*, 25 September 2015)

Under the context of *Gerwani*, the metonymy distributed by the headline editorial ensures the representation of meaning to be received more wholistically rather than partially. Thus, the use of metonymy, especially a whole-for-a-part form, manages to create a bigger gravity of the issue referring to *Gerwani* which the editorial considers it to be a national issue that has to be the concern of the government as well. The use of metonymy, mostly to represent a part of something into a wholistic level, becomes the ideological standpoint of the editorials that see the current fate of ex-*Gerwani* members who struggle over injustice in getting their basic rights as an Indonesian. Thus, to create a bigger persuasion towards its readers, they stand mostly in this type of metonymy.

B. Quotation out of context

The examples can be referred below:

1. The winners of life

(*The Jakarta Post*, 13 June 2016)

Context: It is about the story of 22 female survivors of the 1965 tragedy who were photographed by Adrian Mulya to pose for his photo essay book *Pemenang Kehidupan* (The Winner of Life).

2. 'Jurnal Perempuan': Facing off against
fundamentalism

(*The Jakarta Post*, 13 August 2010)

Context: *Jurnal Perempuan* Foundation (JPF) launched the country's first feminist journal named *Jurnal Perempuan* that is progressive enough to give understanding about how *Gerwani* can be a role model for women's empowerment during the Old Order regime because of its big contribution that helped build Indonesia.

The above headlines do not clearly state the intended meaning of what the rest of the story implies, however, they are made to grow curiosity by picking up a piece of

information that is quoted within the story itself. Even though they are quoted out of the contexts, it is hoped that the readers nurture their enquiry mental to think about how the headline relates towards the latter news story. Summarised in "The Winners of Life", for instance, it turns out to be the quote from editorial that comes from the name of photo essay book *Pemenang Kehidupan* (The Winner of Life) by Adrian Mulya, a photographer who concerns on female survivors in the 1965 tragedy. The ideological standpoint from this type of rhetorical device is hard to be seen to refer specifically to *Gerwani*, but the main agenda can be seen, for example in the second example, the headline has something to do with a way to practically fight against fundamentalists in the country that hinder Indonesian women's agenda who are progressive in exercising their rights, especially in relation with their gender role struggle.

C. Alliteration

The repetition of starting letters can be exemplified below:

1. Violation victims demand vindication.

(*The Jakarta Post*, 14 December 2012)

2. That formula: 'Kill or be killed'

(*The Jakarta Post*, 1 October 2015)

3. 1965 Tragedy Not Yet a Priority for Jokowi

(*Tempo*, 26 August 2016)

The three examples above present a repeated section of the starting letters, such as in 'violation victims demand vindication', 'kill or be killed', and 'in tragedy, priority, and Jokowi'. The rhyming sound of alliteration garners the readers' reading effort because they can see a contextual momentum of the main idea in the news story. Those headlines surely depict a specific ideology maintained. For example, in the first exemplification, the word "vindication" ideologically holds just attitude, focusing on the essence of justice, how it has to be enforced in the society, especially to those who used to be *Gerwani* members, or perceived to be so. The same goes for the second exemplification, in which "kill" ideologically holds something morally wrong in most societies. Thus, the headline is intended to shape the readers' opinions upon how kill or be killed can be justified, in relation with *Gerwani* case. The third example shows how the rhyming does not have to be in the front part, but it can be made in the ending sound of the letters of words, emphasizing how there is an ideological relationship among the rhythmic words, questioning Jokowi, as the President of Indonesia and as the representative of Indonesian society, about his priority in civil and human rights issues, especially over the 1965 tragedy.

¹ Lekra is an acronym of *Lembaga Kebudayaan Rakyat*, meaning Institute for the People's Culture. It is a literary and social movement

associated with Indonesian Communist Party, focusing on arts to promote social progress and reflect social realities, established in August 1950.

D. Parallellism

The examples of parallellism in *Gerwani*-related online headline editorials can be seen below:

1. Violent anti-communism is alive and well in democratic Indonesia
(*The Conversation*, 4 March 2015)
2. The 1965 controversy and need for people's tribunal
(*The Jakarta Post*, 16 April 2015)

The first example shows the same pattern used in adjectives (alive and well), while the second example shows parallellism through the same pattern used in nouns (controversy and need). Parallellism helps the readers to notify the presence of the important details of the headline since it uses the same linguistic structure, for example, in "Violent anti-communism is alive and well...". The parallellism happens for the sense of characterizing an anti-communism society in Indonesia, described as "alive" and "well", making it more persuasive in implying a certain meaning that as its consequence, questioning whether Indonesia is consistent in providing space for holding onto democratic ideology. Those examples are occupied under the notion of parrallellism, intending to create persuasive force of the headline because of the way how the headline is made repetitively, in terms of the patterns of the words.

E. Testimonial

Testimonial can be exemplified in:

1. Saskia Eleonora Wieringa: Debunking myths on Indonesian women's movement
(*The Jakarta Post*, 21 April 2010)
2. Yosep Stanley Adi Prasetyo: Striving to resolve human rights violations
(*The Jakarta Post*, 24 Maret 2008)
3. Ko Swan Sik: "It's a Human Rights Game"
(*The International People's Tribunal (IPT) 196*, 13 November 2015)

As testimonial refers to a rhetorical device that use testimonies from a person or institution to endorse its related description towards the news story to convince the readers, the examples above show clearly upon what testimony means. Testimony is a formal written or spoken statement that provides an attestation or evidence by the existence of

something. The examples above give a hint about what the human rights activists think about the case of *Gerwani*, especially how to resolve the human rights issue related with the 1965 tragedy. Thus, the names are written in details to ensure that those interested readers will have clues about the perspectives that these people have. The main idea of those headlines headlines is to give clear depiction about the story behind *Gerwani*-related case and its human rights issue and how Indonesian society should respond, especially for those who care. The influence factor from this rhetorical device is gained by naming Saskia, Yosep Stanley, and Ko Swan Sik as those people who are an expert in the field to form a belief that the readers will be able to find the force of the power in the headline, following the related description of the news story.

F. Irony

The examples, especially in the case of *Gerwani*, can be comprehended below:

1. Indonesian women: their choices, 'destiny'
(*The Jakarta Post*, 16 August 2016)
2. Ignorance helps excuse mass killings
(*The Jakarta Post*, 29 September 2012)

Exploring from the first example of the headline editorials, for instance, the use of 'choices' and 'destiny' at the same time seems intriguing. As the editor prefers the words "their choices, destiny", these words represent the consequence of Indonesian women who have a choice to not better think about it. Referring to the word "choice", it is supposed to have two consequences; the first is about giving someone rights to have options, and the second is about how that someone is aware of the options given so that he or she can have rational decisions to go for the chosen option. On the other hand, the word "destiny" is interestingly the opposite. When a person faces his or her destiny, it means that he or she cannot avoid a predetermined course of events considered as something beyond human power to control. It means that that person received an ill-fated future that he or she cannot prevent so. This headline somehow brings contradicve yet sarcastic notion to be ideologically interpreted under irony intending to create a mockery towards Indonesian government and the majority of society, especially on women's rights that was not well-presented from

the very first generation of women organisation, *Gerwani*, even for nowadays situation.

G. Rhetorical question

The examples are as follow:

1. Resolving the tragedy of 1965: Mission impossible?
(*The Jakarta Post*, 30 September 2015)
2. 1965 symposium: a glimmer of hope?
(*The International People's Tribunal (IPT)* 1965, 29 May 2016)

As rhetorical question deals with an expression or utterance in the form of a question, that is asked to make a point rather than to prompt an answer, those two headlines above represent it well. In influencing the readers' beliefs, the first example is not meant to have an answer whether it is mission impossible or not, but it is created to emphasize the needs of resolving the unfinished 1965 tragedy that needs to be done by the state. It is made for a stylistic effect, with the purpose of emphasizing the agonizing condition faced by the victims of the tragedy. The second example of the headline does the same in trying to provoke the inner sensitivity of the readers upon the symposium regarding to the case in 1965 that was government-sponsored, ensuring the expected outcomes of open discussion among government agents, human rights activists, 1965 victims, and other concerned stakeholders would lead to a breakthrough despite the increasingly-narrow political space to discuss 1965 and the anti-communist violence in Indonesia. By luring questions in the form of rhetorical ones, it is expected that headlines reserve uncertainty in the readers's mind, which stimulates the readers to question the rest of the news.

H. Antithesis

The examples are illustrated below:

1. The ups and downs of Indonesian women's movement
(*The Jakarta Post*, 20 December 2010)
2. The rise and fall of Indonesian women's movement
(*The Jakarta Post*, 21 April 2010)

The use of antithesis in those two headlines show the opposite portrayal of how Indonesian women's movement apparently moves. Giving this type of rhetorical devices ensures a balance argumentation on things compared, if the antithesis uses adjective characteristics of bringing up something. The

examples above show an opposite correlation as in 'ups' and 'downs' with 'rise' and 'fall' upon the progress of Indonesian women's movement, which *Gerwani* is included in its history, and are to create clear distinction to not only inform but also to reflect the editorial's subjective attitude of beliefs. As mentioned earlier, those headlines are expected not only state an informative value within the headline, but also to argue about the possibility of the growing concerns upon the matter.

From the rhetorical devices explored, the researchers draw a conclusion that headline editorials create a significant influence in the use of their linguistic devices to serve the readers with their persuasive manner towards the readers' ideology, which includes their beliefs, opinions, and value-systems. Headline editorials have rights to create a manipulation of words to ensure that a specific discourse can be maintained. This study, thus, serves as an understanding on how discourse itself can be elaborated by taking both meaning and effects of language use in the production and interpretation of a text into account.

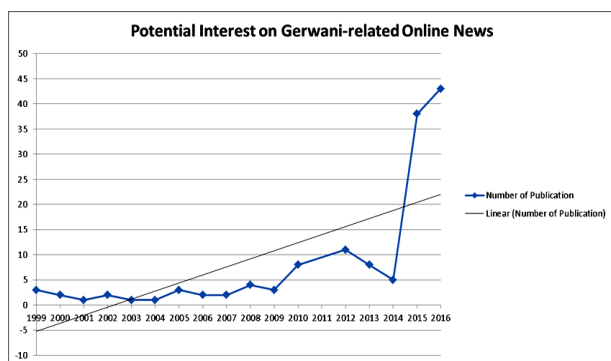
It has been no doubt, as well, that by doing this research, it is realized that headlines contribute towards the establishment of power as a significant persuasive influence to construct the readers' attitudes, beliefs, thoughts, in this case by the media cultivation, in the case of *Gerwani*. Power in discourse, as coined by Foucault [22], is "a productive, complex and continuously evolving web of social and discursive relations". Thus, the interaction between societies is encouraged to which he believes that power is never fixed and stable. Previously, Gramsci [23] also believes on this idea that power can be defined by its significance of its persuasive influence which links to a system of hegemony. Hegemony is "a mechanism through which dominant groups in the society succeed to persuade subordinate groups to accept the former's own moral, political, and cultural values and institutions" [23]. It is exercised through dynamically cultural formations to shape people's attitudes, opinions, and beliefs to be seen as "natural" and "common sense".

That state of ideology above shaped by the New Order government, then, is finally invalidated by the publication of online news editorials after the New Order government forcedly ended by the Indonesian's democratic mob. The editorials also ensured that, from the case of *Gerwani*, headlines should be able to attract the readers and to create relevance towards the topic by using rhetorical devices as one of linguistic tools in

trying to aim for specific intended meanings. The use of 8 rhetorical devices that can be found in the related topic, they are: metonymy, quotation out of context, alliteration, parallelism, testimonial irony, rhetorical question, and antithesis. When they are included in the headlines, the researchers managed to see the significant contribution to help the readers in getting the intended meaning so that the readers may have understood about the context that the headlines cover. After knowing the meaning from the headlines, it is expected that the readers can establish their ideological standpoint, especially from the case of *Gerwani* as exemplified from the sampling in 139 online news headlines.

III. CONCLUSION

The researchers managed to see how the online news editorials have taken an interest to focus on this *Gerwani* matter as it is drawn from a linear trend in Figure 1 that was going up steadily, showing potential interests from the readers as well. It means that headline editorials see the importance to keep engaging with the readers' demand, and indeed the news production showed its consistency. It is clear that the interest to take this case as a potential topic has started since 2015 until then. Thus, in conclusion, it becomes clearer that *Gerwani* news was well-represented. The diagram also represented how the online news media have taken a stance to show a firm support to help ex-*Gerwani* members and their affiliated parties to fight for power struggle in finding justice.



Linear trend of potential interest on Gerwani-related online news

The researchers also draw a conclusion that the focus of media texts can present meaning positioning the audience to create emotional, psychological, or physical responses. It does not mean that media has the right to manipulate the words, but in trying to overcome the sense of simply reporting information, the media needs to attract the potential readers, to be persuaded. Thus,

this study concludes how newspaper headlines in online media publication can represent a certain ideology in understanding a particular case; especially about *Gerwani*-related case.

Further studies in language and educational fields are encouraged to look at the special characteristics that newspaper headlines possess. Linguistically, the headlines can be elaborated textually by the identification of linguistic devices, e.g. the choice of words, rhetorical devices, etc. Pragmatically and discursively, it is expected by recognizing the importance of headlines in newspapers to influence the readers' ideology, which includes beliefs, attitudes, perceptions, etc., it helps headline-oriented and language practitioners to have deep-rooted understanding on how the headlines can be used, either in telling the truth or in manipulating a certain agenda imposed by some institutions. In the educational field, the study of headlines, especially in online version, nowadays can be introduced by language educators to help the students have the most up-to-date information which they can access freely as one of learning materials in stimulating students' critical thinking to care about the social issues, which they live as a part of them. By knowing several implications, the researchers are able to find the relationship between headlines and how they influence the readers' ideology. After knowing so, it is hoped that the readers can understand the intended meaning, which can be analyzed in many fields of disciplines, such as in media communication, discourse, linguistic, journalism, or even in education.

IV. ACKNOWLEDGEMENT

The researchers would like to express their sincere gratitude to Mae Fah Luang University in Chiang Rai, Thailand for providing financial support and other facilities in carrying out this study.

REFERENCES

- [1] S. Isani, "Of headlines and headlines: Towards distinctive linguistic pragmatic genericity," URL:<http://asp.revues.org/2523>, DOI: 10.4000/asp.2523, 2011.
- [2] E. Louw, *The media and cultural production*. London: Sage, 2001.
- [3] B. Johnstone, "Studying identity and agency: CDA, interactional sociolinguistics, narrative analysis, grounded theory in Rhetoric in detail: Discourse analyses of rhetorical talk and text, B. Johnstone & C. Eisenhart, Eds. Amsterdam/Philadelphia: John Benjamins Publishing Company, 2008, pp. 141-146.

- [4] R. A. Metila, "A discourse analysis of news headlines: Diverse framing for a hostage-taking event," *Asian Journal of Social Sciences and Humanities*, vol 2(2), pp.71-78, 2013.
- [5] P. Long & T. Wall, *Media studies: Texts, production and context*. England: Pearson Education Limited, 2009.
- [6] E. P. J. Corbett, *Classical rhetoric for the modern student*. New York: Oxford University Press, 1990.
- [7] G. Tom & A. Eves, "The use of rhetorical devices in advertising," *Journal of Advertising Research*, July-August, pp. 39-43, 1999.
- [8] N. Riemer, *Introducing semantics*. New York: Cambridge University Press, 2010.
- [9] M. White, "Cracking the code of press headlines: From difficulty to opportunity for the foreign language learner," *International Journal of English Studies*, vol 11 (1), pp. 95-116, ISSN: 1578-7044, 2011.
- [10] A. Bonyadi & M. Samuel, "Headlines in newspaper editorials: A contrastive study," *SAGE Open*, April-June 2013, pp. 1-10. DOI: 10.1177/2158244013494863, 2013.
- [11] V. MacRitchie & M. Seedat, "Headlines and discourses in newspaper reports on traffic accidents," *South African Journal of Psychology*, vol 38(2), pp.337-354, 2008.
- [12] P. Simpson & A. Mayr, *Language and power*. New York: Routledge, 2010.
- [13] T. Huckin, "Critical discourse analysis and the discourse of condescension in *Discourse studies in composition*, E. Barton & G. Stygall, Eds. Hampton, NJ: Hampton Press, 2002, pp. 155-183.
- [14] S. Wieringa, "Ibu or the Beast: Gender interests in two Indonesian women's organisations," *Feminist Review*, no.41, pp. 98-113, 1992.
- [15] I. Afiani, "Deconstructing stigma in Amurwani Dwi Lestariningsih's GERWANI: The story of women as political prisoners in Plantungan Camp (1969-1979)," 2nd prize winner of ISRSF (Indonesian Scholarship and Research Support Foundation), Jakarta, 2016.
- [16] M. L. Lyon, "Testimony of a messenger," *Inside Indonesia* vol 124: Apr-Jun 2016 edition. URL: <http://www.insideindonesia.org/testimony-of-a-messenger>, 2016.
- [17] J. Roosa, *Pretext for mass murder: the September 30th Movement and Suharto's coup d'état in Indonesia*. University of Wisconsin Press, 2006.
- [18] S. Drakeley, "Lubang Buaya: Myth, misogyny and massacre," *Nebula*, vol. 4(4), pp. 11-35, 2007.
- [19] S. Wieringa, "Sexual slander and the 1965/66 mass killings in Indonesia: Political and methodological considerations," *Journal of Contemporary Asia*, 41(4), pp. 544-565, DOI: 10.1080/00472336.2011.610613, 2011.
- [20] E. Aspinall & G. Fealy, "Introduction: Soeharto's New Order and its legacy, in *Soeharto's New Order and its legacy: Essays in honour of Harold Crouch*, E. Aspinall & G. Fealy, Eds., 2010, pp. 1-14, Canberra: ANU E Press.
- [21] A. K. Shenton, "Strategies for ensuring trustworthiness in qualitative research projects," *Education for Information* vol 22, pp. 63-75, 2004.
- [22] M. Foucault, *Discipline and punish: The birth of the prison*. London: Allan Lane, 1977.
- [23] A. Gramsci, "Selection from the *Prison Notebooks*," in Q. Hoare & G. Nowell-Smith (eds.), London: Lawrence and Wishart, 1971.

The Study of Slip of Tongue in English Classroom Presentation Produced by Thai and Libyan Students at English Language and Letters Department

Bagus Detrianto

English Language and Letters Department
Universitas Islam Negeri Maulana Malik Ibrahim
Malang, Indonesia

ABSTRACT

This study focussed on the study of slip of tongue which is under the umbrella of Psycholinguistics studies. Thus, the common speech error done by everyone in language production is slip of the tongue, which means what they say is actually not what they mean and what they want to say. In addition, this study aimed to observe the slips of tongue of Thai and Libyan students' utterances in an English classroom presentation in English language and letters department, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia.

The writer used a descriptive qualitative approach since the data obtained were in the forms of words which were transcribed from the Thai and Libyan students' utterances. In order to do the observations, the writer joined their classes. Thus, the writer collected the data using audio recording and note taking in order to get any information regarding to the observations. Then, transcribed the utterances into written forms and analysed it using some theories. Those theories were theory proposed by Fromkin (1973) about eight types of slip of the tongue, and Clark (1977) about the factors which influenced the slips of the tongue.

The writer found almost all kinds of slips if tongue were produced by Libyan student and Thai students in their presentation. Those were anticipations, preservations, blends/haplologies, misderivations/shifts, substitutions, additions, and deletions. Whereas there was one type of slip of tongue which did not occur in their utterances, that was reversals/exchange. In addition, the most type of slip of the tongue was deletion which occurred eleven times. Further, there were several factors which might influence slips of tongue; cognitive difficulty, situational anxiety, social factor. Thus, in this study, the writer found that all factors influenced all the speakers' performances or utterances in English classroom presentation. Somehow, the most influenced factor was cognitive difficulty.

Even though almost all kinds of slips of tongue occurred in their presentations or utterances, but the audience understood about the subjects being told by all the speakers. Therefore, their presentations were still understandable. From all the findings about kinds and possible factors which might influence slips of tongue above, the writer found some possible strategies to overcome it. Due to the fact that the most kind of slips of tongue was deletion and the most factor which influenced it was cognitive difficulty, so it meant that all speakers were less in practices before doing the presentation or they were in hurry when they did the presentations. Therefore, in this case, the speakers should practice more and be calm in presenting their thoughts and understanding concerning with the subject or material being presented in the classroom.

Keywords: Psycholinguistics, slip of tongue, English classroom presentation, Thai and Libyan students.

I. INTRODUCTION

Language is one of the ways of communication. Further, human can interact and influence each other by using language in their daily communication. Somehow, human speech or spoken language is far from perfect. People often do speech errors in any aspect of life, such in daily communication, classroom interaction between teacher and student or student and student, trade interaction between seller and buyer, and so forth. The most speech error produced by people is slips of tongue (SOT). Thus, it is the phenomenon when the speech production has the result that what the speakers say is not really what they mean or the want to. Furthermore, SOT might occur when the

speaker actual utterance differs from the intended utterance [1]. There are some definitions about SOT, one them is from Boomer & Laver as quoted in Fromkin 1973 defines that it is as involuntary deviation in performance from the speakers' current phonological, grammatical, or lexical intention^[1]. However, the most accepted definition is from Dell who defines SOT is an unintended, habitual deviation from a speech plan [2]. From this definition, it is derived that SOT happens due to some criteria. First, there must be an error in SOT, and the other is the speaker must be able to repair their errors [3]. Thus, those criteria can be the inferences for the writer in conducting this study. Furthermore, slip of tongue is one-time error in speech production planning [4]. In addition, there are some situations or factors

which may influence SOT, everyone seems to produce it in daily life. The most often is when the tongue's owner is tired, a bit drunk, or little bit nervous [5].

Based on those explanations, the role of language is obviously crucial, especially English as the international language since this is used as a second language almost in every country in the world. English is employed everywhere since this is a very effective and straight-forward language. This language is used for the need of education, literature, science, economics, and other aspects in every country. Due to its important, the writer aim to have a study concerning in English language. However, there are some problems in practicing the second language. Sometimes, people get troubles and mistakes in their language productions which one of the most problems is slip of tongue. Therefore, in this study, the writer did an observation from the language production which concerning on slips of tongue in English classroom presentation of foreign students who are Thai and Libyan students in English Language and Letters Department, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. In this study, the writer focussed on the types of slips of the tongue proposed by Fromkin [1], and the possible factors which might influence the slips of the tongue proposed by Clark [7]. After analysing it, the writer found some strategies to overcome the slips of the tongue. Therefore, this study is worth-doing.

II. LITERATURE REVIEW

A slip of tongue is a type of speech error in which sounds or entire words are rearranged between two or more different words. Dell [2] argues that when you are formulating a sentence you start at the word-meaning level. Then you start to represent the sentence at the sound level. When you are preparing to say words you active the sounds of the words you want to say and sometimes a similar sound is activated and said instead of the correct sound. In addition, the common slips of tongue usually found are; Anticipations, it occurs in the right place and earlier in the utterance. A unit occurs when a letter segment takes the place of an earlier segment. Jaeger [4] proposes that some items planned for earlier in the utterance is anticipated and effects a unit planned for earlier in the utterance. They differ from shifts in that intrudes on another also remains in its correct location and thus is used twice [6]. *For example: Take my bike → bake my bike.* In perseverations, it occurs in an earlier segment replaces a later items or it comes after the origin [6]. Thus, it

means that some linguistics units planned for and executed earlier in the utterance perseverates and effects a unit planned for later in the utterance. *For example: He pulled a tantrum → he pulled a pantrum.* In reversals, there are two segments are interchanged and so the origin of one error is the target for the other. These errors are also known as spoonerism. According to Carroll [6], exchanges are, in effect, double shifts, in which two linguistics units exchange places. *For example: Katz and Fodor → Fats and Kodor.* In blends or haplogogies, there are two linguistics units that are combined into one item. As Carrol [6] point out that blends apparently occurs when more than one word is being considered and the two intended items fuse or blend into a single item. *For example: The children + young of today → the chung of today. Chung comes from the children and young.* In misderivations, it is when one speech segment disappears from its appropriate action and appears somewhere else. It can be occurred when the speaker somehow attaches the wrong suffix or prefix to the word. *For example: That's so shall be ready in case she decide to hits it → (decides to hit it).* According to Carroll [6], substitutions occur when one segment is replaced by an intruder and differ from previously described slips in that the source of the intrusion may not be in the sentence. *For example: Before the place opens → before the place close.* According to Fromkin [1] (cited in Clark [7]) "in word substitutions, the speakers produce a word that is wrong, but typically related either semantically or phonologically to the word intended". According to Carroll [6], additions is an additional linguistic material. The speaker intended to utter the intended utterance, occasionally he/she adds linguistics material in his/her intended utterance which becomes slips. It is typically related to phonemes, morphemic affixes, articles, prepositions, conjunctions, whole words, or even phrases. *For example: I did not explain this carefully enough → carefully.* Deletion is whereas leave something out. The speakers wanted to utter the intended sentences, yet incidentally he/she leaves out linguistics material. It can be typically related to phonemes, morphemic affixes, articles, prepositions, conjunctions, whole words, or even say his/her intended utterance. *For example: The baby sees fireworks → the baby see fireworks (the affix deletion).*

In addition, the factors which may influence slips of tongue proposed by Clark are cognitive difficulty, situational anxiety, and social factor [7]. Thus cognitive difficulty means people take longer time to produce sentences on topic using the abstract words than the

concrete words. While the situational anxiety means it happens due to a certain situation that makes a speaker become tense, anxious, or worries about it. Whereas social factor means speech plan seems difficult when conversation takes place under pressure. Further, there are some previous studies which were conducted by writer that are focusing on slips of tongue. Karisman [8] investigated about the slip of tongue occurred in the speaking class of English letters and language department students of Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia [8]. In this undergraduate thesis, the writer described about kinds of slip of tongue happened in the speaking class and kind of slip of tongue which is most produced in the speaking class. In addition, the writer used the theory which was proposed by Carroll [6]. The findings show that kinds of slip of tongue which were occurred were shifts or misderivations, substitutions and exchange, reversals or exchanges and deletion. While the most slips of tongue appeared were shifts or misderivations.

The other previous study was conducted by Putri [9], she investigated about the slip of tongue in the news anchor from the compilation videos [9]. In this undergraduate thesis, the writer identified kind of slips which were occurred and describes the contexts which cause slip of tongue in the speech production. In addition, the writer used the theory which was proposed by Fromkin [1] that people who are speaking well or native speakers are possible to make slips in their utterances. The findings shows that the kind of slips appeared were perseverations, deletions, anticipations, additions, blends, and exchanges. Moreover, the type of slips of tongue such as misderivations and substitutions were not found. In addition, the factors which were caused the slips were the situation, duration, spontaneity, and linguistics features surrounding the news anchor. Another previous study is a study which was conducted by Ulfa [10], she investigated about slip of tongue on George W Bush's interview at the presidential scholar graduation [10]. The writer investigated about the types of slips of tongue found and the possible factors which influenced the slips of tongue. In this study, the writer used the theories which were proposed by Fromkin theory [1] about eight types of slip of the tongue, and Clark theory [7] about the factors which influenced the slips of the tongue.

However, there are some differences between the study conducted by the writer and these previous studies. In this study, the writer conducted the investigation on the students' presentation in foreign students who are Libyan student and Thai students in

their English classroom presentation at English Language and Letter Department, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. Different from Karisman [8] who obtained the data from the English speaking class, yet in this study, the writer observed the slips of tongue which might be found in their presentations in the classroom. Furthermore, the writer wanted to observe whether by having the presentations in front of classroom, the slips of tongue would be decreased or increased. In addition, the purposes of this study are to identify and observe what types of slip of tongue occurred in their English classroom presentation, and what are the possible factors which caused the slips of tongue in their English classroom presentation. After that, the writer would find how the strategies to overcome slips of tongue in English classroom presentation which was done by Libyan student and Thai students. Finally, by considering those differences and significances, The Study of Slip of Tongue in English Classroom Presentation Produced by Thai and Libyan Students at English Language and Letters Department is worth-doing.

III. METHODOLOGY

This study applied a descriptive qualitative method in order to know the linguistics phenomena happened in English classroom presentation of Thai and Libyan students in English Language and Letters Department, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia through psycholinguistics point of view. This method used since the data were collected in the form of words and phrases. Creswell defines that qualitative study is a means for exploring and understanding the meaning individuals or groups describe to a social or human problem. This study attempted to describe the speech production which concerns on slip of tongue. In addition, the writer focused on the types of slip of tongue produced and mostly produced, and the possible factors which might influence the slips of tongue in utterances produced by Thai and Libyan students. In identifying and analyzing the data, the writer took the following procedures. Firstly, collecting the data by using audio recording for each presenter in English classroom presentation. Secondly, taking pictures for each presenter who presented their thought and understanding about the topic being presented in front of classroom. After that identifying the utterances which contain slips of tongue. At last, applying the theory proposed by Fromkin theory [1] about eight types of slip of the tongue and Clark

theory [7] about the factors which influenced the slips of the tongue in order to identify and analyze the data. After that, the writer tried to find the possible strategies to overcome or decrease slips of tongue. In addition, the paradigm which the writer worked on is Pragmatism, since this study tries to provide solution from the existing problem which was focused on slips of the tongue in language production.

IV. DISCUSSION

In this study, the writer had transcribed the utterances produced by Thai and Libyan students who are in the sixth semester. There are four students, one is Libyan student and another three are Thai students. In this case, the writer focused on the foreign students who did their English classroom presentations about some of the subjects in Psycholinguistics course in English Language and Letters Department, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. The results can be seen in the table below.

| Types of Slip of Tongue | Students of English Language and Letters Department, Universitas Islam Negeri Maulana Malik Ibrahim | |
|-------------------------|---|--------------------|
| | Libyan Student (LS) | Thai Students (TS) |
| Anticipations | 1 | |
| Preservations | | 1 |
| Reversals/Exchanges | | |
| Blends/Haplogologies | 1 | 2 |
| Misderivations/Shifts | | 1 |
| Substitutions | 3 | 4 |
| Additions | 2 | 3 |
| Deletions | 5 | 6 |
| TOTAL | 12 | 17 |

From the information of data above, the writer found that there were 29 data or slips of tongue produced by a Libyan student and Thai students. The types that were occurred in their utterances were anticipations, preservations, blends/haplogologies, misderivations/shifts, substitutions, additions, and deletions. Whereas there was one type of slip of tongue which did not occur in their utterances, that was reversals/exchange. In addition, the most type of slip of the tongue occurred was deletion which was occurred eleven times. In order to know the utterances produced by all the speakers, the writer provided the data with its contexts below.

Datum 1 – 12 are the transcription of Libyan student's (LS) utterances.

Datum 1

Utterance: ...we are.. hmm.. me and my friends, each one will...

Analysis: from this context, the writer found that LS said “we are”, but actually what she really wanted to say was “me and my friends”. In this case, the LS did one of the types of slips of tongue called *anticipations*. Due to the fact that the LS utterance occurred in a right place, but earlier in its utterance, therefore a unit occurred when a letter segment took a place of an earlier segment.

Datum 2

Utterance: ...each one will take a **part it** to make it clear for you to understand....

Analysis: Further, in this context, the writer found that LS said “a part it”, but actually what she should say “a part of it”. In this case, the LS did one of the types of slips of tongue called *deletions*. Since the utterance missed a linguistics material out by only saying a part it rather than a part of it.

Datum 3

Utterance: ...**what is** actually autism and asparagus syndrome...

Analysis: In this context, the writer found that LS said “what is actually autism and asparagus syndrom”. Thus, there are actually two definitions which would be explained by the speaker, but the speaker used auxiliary verb in a singular form “is”. Therefore, the LS did one of the types of slips of tongue called *substitution*. Since the utterance was wrong by changing the auxiliary verb.

Datum 4

Utterance: ...and how.. and **how it place** pragmatics based on scale implicature...

Analysis: For this context, the writer found that LS said “how it place”. Somehow, it was wrong. Due to the fact that the word “it”, was singular form, therefore it must be followed by infinitive (verb 1) + s. Thus, the sentence or utterances should be “how it places”. In this case, the LS did one of the types of slips of tongue called *deletions*. Since the utterance missed a linguistics material out by saying how it place rather than how it places.

Datum 5

Utterance: A.. First, I would like to.. **to present here** definition of autism....

Analysis: Further, in this context, the writer found that LS said “to present here definition of autism”, but

actually speaker only needed to say “*to present definition of autism*”. Thus, it should be without the word “*here*”. Therefore, in this case, the LS did one of the types of slips of tongue which called *additions*. Since the speaker added a linguistics material which was not really needed.

Datum 6

Utterance: A.. People with autism has **the resptunse** a.. to be misunderstood ...

Analysis: In this context, the writer found that LS said “*autism has the resptunse*”, but what she actually should say was “*autism has the response*”. Therefore, in this case, the LS did one of the types of slips of tongue called *blends/haplologies*. Due to the fact that there are two linguistics units combined into one item.

Datum 7

Utterance: the second is what is asparagus syndrome. Actually, asparagus **syndrome is a parts** of a.. autism ...

Analysis: In this context, the writer found that LS said “*asparagus syndrome is a parts of*”, but actually what she should say was “*asparagus syndrome is a part of*”. Thus, the speaker did not need to add suffix “*s*” after the word “*part*”. Since the auxiliary verb “*is*” meant the following word should be in the form of singular. Therefore, in this case, the LS did one of the types of slips of tongue which called *additions*. Since the speaker added a linguistics materials which was irrelevant.

Datum 8

Utterance: ...**people who has** a.. like normal or above normal IQ...

Analysis: Further, in this context, the writer found that LS said “*people who has*”, but actually what she should say was “*people who have*”. Since the word “*people*” indicate the plural form, thus the auxiliary verb should be have rather than has. In this case, the LS did one of the types of slips of tongue which called *substitutions*. Since the utterance of the speaker was wrong and not relevant.

Datum 9

Utterance: ...actually dealing with asparagus syndrome a.. a.. find difficulty **to undify**...

Analysis: Further, in this context, the writer found that LS said “*find difficulty to undify*”. However, it should be “*find difficulty to identify*”, thus the speaker perhaps was in hurry or nervous then there was slip in her utterance. Therefore, in this case, the LS did one of the

types of slips of tongue which called *substitutions*. Since the utterance of the speaker was wrong and irrelevant to the context.

Datum 10

Utterance: ... identify and **express their feeling**...

Analysis: In this context, the writer found that LS said “*express their feeling*”, but actually what she should say was “*express their feelings*”. In this case, the LS did one of the types of slips of tongue which called *deletions*. Since the utterance missed a linguistics material out. In this case, the speakers only said express their feeling rather than express their feelings.

Datum 11

Utterance: ...In this journal, we will have a look on adults a.. **they a.. a.. autism and asparagus syndrome adults**...

Analysis: Further, in this context, the writer found that LS said “*They a.. a.. autism and asparagus syndrome adults*”, but actually what she should add the auxiliary verb “*are*”, Thus, it should be “*They are autism and asparagus syndrome adults*”. In this case, the speaker perhaps was nervous then what she wanted to say did not come up. Therefore, the LS did one of the types of slips of tongue which called *deletions*. Since the utterance missed a linguistics material out which was the auxiliary verb “*are*”.

Datum 12

Utterance: ...if it **presented** in a number in any normal individual, he will understand some but not all students pass the exam...

Analysis: Further, in this context, the writer found that LS said “*if it presented in a number in any individual*”. However it should be “*if it is presented in a number in any individual*”. Since the sentence was in the form of passive voice, therefore the auxiliary verb should be added. Therefore, in this case, the LS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which was the auxiliary verb “*is*”.

Datum 13 – 29 are the transcription of Thai students’ (TS) utterances.

Datum 13

Utterance: ...**sentence were presented** in the sentence of the screen...

Analysis: In this context, the writer found that TS said “*sentence were presented*”. However it should be

should “*sentences were presented*”. Since the auxiliary verb was “were”, therefore the subject should be in the plural form. Thus, in this case, the LS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out.

Datum 14

Utterance: ...me.. **mesumened for each..** measurement for each participant...

Analysis: In this context, the writer found that TS said “*mesumened for each*”. However, it should be “*measurement for each*”. Therefore, the TS did one of the types of slips of tongue called *substitution*. Since the utterance was wrong and not relevant or ambiguous. Due to the fact that what the speaker wanted to say was not same with what she spoke.

Datum 15

Utterance: ...as the distributions of these **percentages of response...**

Analysis: Further, in this context, the writer found that TS said “*as the distribution of these percentages of response*”. However it should be “*as the distribution of these percentages of responses*”. Since there are many percentages, thus the response should also be in the plural form. Therefore, in this case, the LS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which was the suffix “s” to indicate the plural form.

Datum 16

Utterance: ...based on various findings that **pragmatics responder are** slower than logical responder...

Analysis: Further, in this context, the writer found that TS said “*based on various findings that pragmatics responder are slower than logical responder*”. However it should be “*based on various findings that pragmatics responders are slower than logical responders*”. Due to the fact that the auxiliary verb used was “are”, therefore it should be followed by plural form. Thus, in this case, the LS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which was the suffix “s” to indicate the plural form.

Datum 17

Utterance: ...participants were divided into **pragmatic responder** and logical responders...

Analysis: Further, in this context, the writer found that TS said “*participants were divided into pragmatic*

responder and logical responders”. However it should be “*participants were divided into pragmatic responders and logical responders*”. Due to the fact that the sentence showed the comparison between pragmatic and logical responders, therefore it should be balance. If the logical responder was in plural form, thus the pragmatics responder should also be in the plural form. Therefore, in this case, the TS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which was the suffix “s” to indicate the plural form.

Datum 18

Utterance: ...the next is **corfusion**, em.. the conclusion...

Analysis: Further, in this context, the writer found that TS said “*the next is corfusion*”. However, it should be “*the next is conclusion*”, thus the speaker perhaps was nervous then there was slip in her utterance. Therefore, in this case, the LS did one of the types of slips of tongue which called *substitutions*. Since the utterance of the speaker was wrong, other segment were replaced by another.

Datum 19

Utterance: ...the conclusion, this **researchs** provide diagnostic...

Analysis: Further, in this context, the writer found that TS said “*the conclusion, this researchs provide diagnostics*”, but actually speaker only needed to say “*the conclusion, this research provides diagnostics*”. Thus, it should be without the suffix “s” after the word research, since the research was only one. Therefore, in this case, the TS did one of the types of slips of tongue which called *additions*. Since the speaker added a linguistics material in a part of her utterances.

Datum 20

Utterance: ...this **research** provide diagnostic...

Analysis: from this context, the writer found that LS said “*this research provide diagnostics*”, but actually what she really wanted to say was “*this research provides diagnostics*”. In this case, the TS did one of the types of slips of tongue which called *misderivations/shifts*. Due to the fact that one speech segment disappears from its appropriate action and appears somewhere else. Thus, it was the suffix “s” in the word *research* should be omitted and moved to the word *provides*.

Datum 21

Utterance: ...**diagnostic stubtitutions** which indicrase...

Analysis: from this context, the writer found that LS said “*diagnostic stubtitutions*”, but actually what she really wanted to say was “*diagnostic substitutions*”. In this case, the TS did one of the types of slips of tongue which called *preservations*. Due to the fact that in TS utterance, some linguistics units planned for and executed earlier in the utterance perseverates and effects a unit planned for later in the utterance.

Datum 22

Utterance: ...**which indicrase that** many student who were diagnosed...

Analysis: In this context, the writer found that LS said “which indicrase that many student who were diagnosed”, but what she actually should say was “which indicate that many student who were diagnosed”. Therefore, in this case, the LS did one of the types of slips of tongue called *blends/haplologies*. Due to the fact that there are two linguistics units combined into one item.

Datum 23

Utterance: ...several language disorder that would be regarded as **marry things** a.. diagnoses...

Analysis: Further, in this context, the writer found that TS said “*several language disorder that would be regarded as marry thing*”. However, it should be “*several language disorder that would be regarded as marry thing*”, thus the speaker perhaps was nervous then there was slip in her utterance. Therefore, in this case, the TS did one of the types of slips of tongue which called *substitutions*. Since the utterance of the speaker was wrong, other segment were replaced by another. Thus, it is from the word marry thing which should actually be many things.

Datum 24

Utterance: ...diagnoses of autism **aspecterm** disorder...

Analysis: Further, in this context, the writer found that LS said “*diagnoses of autism aspectrum disorder*”, but actually speaker only needed to say “*diagnoses of autism spectrum disorder*”. Thus, it should be without a morpheme “a”. Therefore, in this case, the TS did one of the types of slips of tongue which called *additions*. Since the speaker added a linguistics material which was wrong and not needed.

Datum 25

Utterance: ...this study also has implication o.. **for our invaluation** of the research...

Analysis: In this context, the writer found that LS said “*this study also has implication o.. for our invaluation of the research*”, but what she actually should say was “*this study also has implication o.. for our evaluation of the research*”. Therefore, in this case, the TS did one of the types of slips of tongue called *blends/haplologies*. Due to the fact that there are two linguistics units combined into one item in her utterance.

Datum 26

Utterance: ...**many study of student** with...

Analysis: In this context, the writer found that TS said “*many student of student with*”. However it should be should “*many students of student with*”. Due to the fact that the word “study” followed by suffix “es”. Thus, in this case, the LS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which is suffix “s”.

Datum 27

Utterance: ...**language disorder that were publi.. publishes** in the last century...

Analysis: Further, in this context, the writer found that TS said “*language disorders that were publi.. publishes in the last century*”. However, it should be “*language disorders that were published in the last century*”, thus the speaker perhaps was nervous then there was slip in her utterance. Therefore, in this case, the TS did one of the types of slips of tongue which called *substitutions*. In addition, the utterance of the speaker was in the form of passive voice, therefore after the auxiliary verb “were” then it should be followed by past participle (verb 3).

Datum 28

Utterance: ...they **will** have include students who would **nowaday** re.. be regard.. regarded...

Analysis: Further, in this context, the writer found that TS said “*they will have include students who would nowaday*”. However it should be “*they will have include students who would nowadays*”. Due to the fact that the written from of nowaday was wrong due to the deletion. Thus, it should be “*nowadays*”. Therefore, in this case, the TS did one of the types of slips of tongue which called *deletions*. Since the speaker utterance missed a linguistics material out which was the suffix “s”.

Datum 29

Utterance: ...as having a.. ASD or Autism.. aa.. autism.. aa.. **Aspectrum** Disorder...

Analysis: In this context, the writer found that TS said “as having a.. ASD or Autism.. aa.. autism.. aa.. *Aspectrum Disorder*”, but actually what she should say was “as having a.. ASD or Autism.. aa.. autism.. aa.. *Spectrum Disorder*”. In this case,, the speaker added prefix “a” after the word “*spectrum*”. Therefore, the TS did one of the types of slips of tongue which called *additions*. Since the speaker added a linguistics materials which was irrelevant to the context.

All the data above are the transcriptions of the utterances produced by the Libyan student and Thai students in English Classroom presentation, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. Thus, from all those data, the writer found that the types of slips of tongue which were occurred in their utterances were anticipations, preservations, blends/haplologies, misderivations /shifts, substitutions, additions, and deletions. Whereas there was one type of slip of tongue which did not occur in their utterances, that was reversals/exchange. In addition, the most type of slip of the tongue occurred was deletion which was occurred eleven times. In addition, the factors which might influence the slips of tongue produced by the speakers were shown in the table below.

| No. | Data. | Factors | | |
|-----|----------|----------------------|---------------------|---------------|
| | | Cognitive Difficulty | Situational Anxiety | Social Factor |
| 1. | Datum 1 | ✓ | | |
| 2. | Datum 2 | ✓ | | |
| 3. | Datum 3 | ✓ | | |
| 4. | Datum 4 | ✓ | | |
| 5. | Datum 5 | ✓ | | |
| 6. | Datum 6 | | ✓ | |
| 7. | Datum 7 | ✓ | | |
| 8. | Datum 8 | ✓ | | |
| 9. | Datum 9 | | | ✓ |
| 10. | Datum 10 | ✓ | | |
| 11. | Datum 11 | | ✓ | |
| 12. | Datum 12 | | | ✓ |
| 13. | Datum 13 | ✓ | | |
| 14. | Datum 14 | ✓ | | |
| 15. | Datum 15 | ✓ | | |
| 16. | Datum 16 | ✓ | | |
| 17. | Datum 17 | ✓ | | |
| 18. | Datum 18 | | | ✓ |
| 19. | Datum 19 | ✓ | | |
| 20. | Datum 20 | ✓ | | |
| 21. | Datum 21 | | | ✓ |
| 22. | Datum 22 | | | ✓ |
| 23. | Datum 23 | | | ✓ |
| 24. | Datum 24 | ✓ | | |

| | | | |
|-------|----------|----|---|
| 25. | Datum 25 | | ✓ |
| 26. | Datum 26 | | ✓ |
| 27. | Datum 27 | | ✓ |
| 28. | Datum 27 | ✓ | |
| 29. | Datum 29 | ✓ | |
| TOTAL | | 18 | 3 |
| | | | 8 |

From the table above, the writer found that the most possible factor which might influence the slips of tongue produced by the Libyan student and Thai students was cognitive difficulty. Since almost all speakers did their slips of tongue in term of this factor. Thus, it was proved when they do hesitation a lot and get difficulty in order to say the right word which they meant and wanted to say. Somehow, the slips of tongue and the factors which might influence slips of tongue did not mean that all the speaker failed in communication or their presentations. Due to the fact that the explanations were still understandable.

V. CONCLUSION

According to the discussion, the writer found that almost all kinds of slips if tongue were produced by Libyan student and Thai students in English classroom presentation, Universitas Islam Negeri Maulan Malik Ibrahim Malang, Indonesia. Those kinds of slips of tongue produced were anticipations, preservations, blends/haplologies, misderivations /shifts, substitutions, additions, and deletions. Whereas there was one type of slip of tongue which did not occur in their utterances, that was reversals/exchange. In addition, the most type of slip of the tongue occurred was deletion which was occurred eleven times. In addition, there were several factors which might influence slips of tongue; cognitive difficulty, situational anxiety, social factor. Thus, in this study, the writer found that all factors influenced all the speakers' performance or utterances in English classroom presentation. Somehow, the most influenced factor was cognitive difficulty. In this case, all speakers got difficulty to say the right words which they meant or wanted to say.

However, it did not mean that they failed in their communication or presentations. Even though almost all kinds of slips of tongue occurred in their presentations or utterances and all factors influenced their performance in English classroom presentation, but the audience understood about the subjects being told by all the speakers. Therefore, their presentations were still understandable and running well. From all the findings about kinds and possible factor which might influence

slips of tongue above, the writer found some possible strategies to overcome it. Due to the fact that the most kind of slips of tongue occurs was deletion and the most factor which influenced it was cognitive difficulty. Therefore, it meant that all speakers were less in practices before doing the presentation or they were in hurry when they did the presentations. Therefore, in this case, the speakers should practice more and be calm in presenting their thoughts and understanding concerning with the subject or material being presented in front of the classroom.

REFERENCES

- [1] Fromkin, V., *Speech Error as Linguistics Evidance*. Paris: Mouton, 1973, pp. 217.
- [2] Dell, G. S., A Spreading-Activation Theory of Retrieval in Sentence Production. *Psychological Review*, 93(3), 1986, pp. 283-321.
- [3] Poulisse, N., *Slips of the Tongue*. Philadelphia: John Benjamins Publishing Company, 1999, pp. 91.
- [4] Jaeger, J. J., *Kid's Slips: What Young Children Slips of the Tongue Reveal about Language Development*. Mahwah, NJ: Lawrence Erlbaum Associates, 2005, pp. 2.
- [5] Aitchinson, J., *The Articulate Mammal: An Introduction to Psycholinguistics*. London: Routledge, 2007, pp. 20.
- [6] Carroll, W., *Psychology of Language*. Pacific Grove, California: Brooks/Cole Publishing Company, 1986, pp: 254.
- [7] Clark, H.I and Clark, E.V., *Psychology and Language. An Introduction of Psycholinguistics*. New York: Harcourt Brace Jovanovich Publishers, 1997, pp. 271
- [8] Karisman, D. "A Psycholinguistics Research on Slip of Tongue Occurred in the Speaking Class of English Letters and Language Department Students of UIN Malang". Unpublished.
- [9] Putri, C, N, R. "Slip of Tongue of News Anchor". Unpublished
- [10] Ulfa, R. "Slip of Tongue on George W Bush's Interview at the Presidential Scholar Graduation". Unpublished
- [11] Creswell, J. W., *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd Ed). United States of America: SAGE Publications, Inc, p. 4, 2009.

The Attitude And Future Perspective of 9th And 12th Grade English Program Students Towards Globalization In Khon Kaen City, Thailand

Dr. Chuanchen Bi, Nithikarn Sanoamuang, Virochsaengaroon, Benoit Nadeau, Mathew Foley, Suthai Katima, Proychai Klakayan, Kannaporn Sanoamuang, Yoshio Maki, Phataraporn Thayaseree, Chairat Wattanachotiwat

International College, Khon Kaen University, Khon Kaen, Thailand

ABSTRACT

The globalization, caused by the rapid development of Information and Communication Technology (ICT), is becoming an inevitable trend in the present world. The developed part of our human society, not the whole world, is undergoing a fundamental transition from a knowledge-based economy to a knowledge-based society. Globalization is not a new phenomena in 21st century, but the impact could spread in all perspectives. Youth or adolescent as the vulnerable group which could not control the speed or directions of the social change as the impact of globalization. Hence, the globalization mostly impacted to the youth or adolescent group. This paper study about the attitude and future perspective on globalization among 9th and 12th grade students who enrolled with English Program in Khon Kaen Province, Thailand. The researchers took this level which has the range age for the youth group. This study using primary data which collected 124 of 9th grade students and 201 of 12th grade students. The research results indicated that the respondents from 12th grades were more willing to live in big cities and that traditional music styles are neither popular nor attractive anymore. Among the participating adolescent students, big cities such as Bangkok, Chiang Mai, etc. are more attractive for them. The willing of migration is higher than 72% in 12th grade students. Sustainable development in the agricultural based region needs contributions from the locals. However, the willings of migration might act against this participation.

Keywords: Attitude; Future Perspective; 9th grade student; 12th grade student; globalization; English Program

I. INTRODUCTION

Globalization act as the ambiguous relationship for the benefit and the causal impact from the benefit. Clearly, globalization could offer a benefit for the country in the economic side. However, substantially, the social cost could impact to the young generation for the tenuous of transnational status within an uncertain and rapidly evolving global context. Generally, globalization could define as the changing of the world and combined it with technology improvement. Robertson (1992) define globalization as the subjection and also intensification for the awareness of world in a whole aspects [1]. Moreover, globalization refers to the rapidly developing process with lots of complex interconnections in societies, cultures, institutions and individual in the world-wide. Currently, the world seem smaller because lots of compression in time and space, shrinking of distance, easily to cross and bring world become smaller and closer from one to another [2]. Devereux (2014) describe the keys features for the definition of globalization, there are : (1) the growing level for the connectedness between individuals, societies and nation states at a global level; (2) the reduction for the distance matter between individuals, societies and nation states for both times and space which could facilitate by

technological developments; (3) the development of Information Communication Technologies (ICTs) rapidly allows rapid transfer of information, knowledge and capital, (4) increasing of awareness for global phenomena in people's (local) lives [3].

Teenagers or youth appears as the young generation with unstable for emotion and need full mentoring from the adult regarding facing the globalization impact. Young generation including the vulnerable group to get the impact of the negative side from globalization. They could not control the speed or directions of social change or even receive, process and take the positive influence from the globalization. The flow across cultures of ideas, goods and people is not new anymore, but the current extent and speed of globalization never had before. Interaction between one to other become higher intense with the increasing of migrations, worldwide media dissemination, multinational companies everywhere, tourism travel and so forth [4, 5]. Giddens (2000) defined the globalization as the intensification for social relations which link with distant localities that could shaped in local happenings by events occurring in many miles away. For this context, the relations of improving economics and cultural interdependence of societies is particularly interesting phenomena [5].

Multimedia is one of the tool for overspread and straiten the information gap between one to other which located in distance. However, the multimedia also the tool which could bring negative impact to the social change and caused the lossing identity in culture and place. Young or teenage group who will be the future group and become the backbone for the future development. Otherwise, the young or called as adolescent group which aged in 11 to 18 years old, is the fragile and vulnerable group to accept and screen their perspective and attitude as the impact of globalization to implement and develop for their future. Therefore, this study is to study the current attitude, behavior and future perspective of 9th and 12th grade students as the young group towards globalization.

II. METHODS

This study is using primary data which collect to the two different level of school. The data was gathered in the March of year 2017. They are 9th grade level (junior high school) and 12th grade level (high school). This study was took the data in *Kaen Nakhon School* at Khon Kaen City.

The instrument for collecting data is using questionnaire with self-administered technique. The instruments already develop by Prof. Dr. Annika Mattisek in several researches in several countries. The students receive the questionnaire and fill by themselves. After their finished answering the questionnaire, the students return it to the researcher.

What is the attitude and behavior of the adolescent students among the globalization, what are the major concerns of the adolescent students, and what is their future perspective (working flow, dreaming jon, etc) unde the globalization will be asked in this research. Due to this, the research specifically selected students who enrolled with english program(EP), as English is widely used among those respondents. The questionnaires were given to the youth students and they filled them out by themselves. Some of the students ignored the questions that they thought were too sensitive for them to answer, e.g what is your attitude to marrying a foreigner.

The data analysis for this study uses univariate analysis and descriptive analysis to show the prevalence of the sample. The researcher uses SPSS IBM 20 as the statistic analysis tool to analyze the result.

III. RESULT

The result of this research will be divided into three parts, firstly, it will describe the characteristics of the

respondents; secondly, their attitude to the globalization era; thirdly, the future perspective under globalization. The characteristics of the respondents will be described by their socio-economic status, their standard of living and their family conditions. The following phase of this study is to describe the attitude and behavior of the under-graduate students, regarding globalization. In this phase, researcher explored their frequency of using the internet, their attitude towards music; the respondents' expression of ecology, economics and social structure issues; their appraisal of the global warming issue; and their attitude towards the personality they would like to be. The third part explains how the respondents think about the future of the place, what is their attitude towards the big cities, where they want to live in the future and their dream career that may also impact to their decision making.

Characteristics of the 9th and 12th Grade Students

In the study, a total 147 respondents were carried out from Kaen Nakhon school, Khon Kaen city. The characteristics in this study describe their gender, ages and their way of life, including what areas they live in and the condition of their housing.

Table. 1 Characteristics of the Respondents

| | 9th grade (%) | 12th grade (%) |
|----------------------------------|---------------|----------------|
| Gender | | |
| Male | 56.2 | 51.6 |
| Female | 43.8 | 48.4 |
| Ages | | |
| 14 years old | 10.7 | 0 |
| 15 years old | 89.3 | 0 |
| 16 years old | 0 | 0 |
| 17 years old | 0 | 23.5 |
| 18 years old | 0 | 76.5 |
| Lived in | | |
| Rural | 0 | 0 |
| Sub-Urban | 15.3 | 21.8 |
| Urban | 84.7 | 78.2 |
| Education level of Father | | |
| Graduated 6 th grade | 2.4 | 1.7 |
| Graduated 9 th grade | 6.9 | 8.9 |
| Graduated 12 th grade | 13.2 | 15.9 |
| Graduated bachelor degree | 64.4 | 53.1 |
| Post-graduated | 13.1 | 20.4 |
| Education level of Mother | | |
| Graduated 6 th grade | 3.2 | 9.4 |
| Graduated 9 th grade | 1.5 | 7.9 |
| Graduated 12 th grade | 25.3 | 27.5 |
| Graduated bachelor degree | 65.2 | 51.9 |
| Post-graduated | 4.8 | 3.3 |

The background of the family member also asked in the questionnaire regarding the background of the parents, including the education level and their work position. Most of the father education level for 9th grade students

is graduated bachelor degree (64.4%) and post graduated (13.1%), compare with the 12th grade students which spread in graduated bachelor degree (53.1%), and post-graduated (20.4%). It is also reinforced with the mother's education level for 9th grade students, mostly in graduated in bachelor degree (65.2) compare to the mother education level of 12th grade students (51.9%). It means that the education background of parents between 9th and 12th grade students, the parents of 9th grade students has better educational background and environment compare with 12th grade students.

The Attitude of 9th and 12th Grade Students Regarding Globalization

The phenomenon of dissonant acculturation [6] happen when the exposure for a new culture could leads to more rapid change among adolescent rather than the adult. This part dig futher for the attitude of the 9th and 12th grade students, including the expression and behavior regarding globalization impact which already happen until recently. The researchers encourage the expression from the 9th and 12th grade students concerning ecology, economics and social structure issues (see table 2).

Wallace (2001) stated that the global appointed of citizenship undermined the inequality [7]. Development activities mostly underpinned the young people and put them as the powerless for globalization process in each sectors. Dissimilarity appear for the several impact of the young generation as the implementation process in each country. Intervention is needed to strengthen their participation and input of the processes during determination of their future want to be.

Table 2 explain the phenomena of the expression of how important ecology, economics and social structure issues. It is describe the more educated of students, the judgement of how important the ecology, economics and social structure issues become increase. The 12th grade students believe that the economic issue is the thing which could promote better life for their future. The interesting point when both of this group have the same expression regarding sustainability of traditional social culture which less than 70% from each of the group state that this issue as the very important issue.

Table. 2. The expression of how important of ecology, economics and social structure issues

| Questions | 9 th Grade | | | | 12 th Grade | | | |
|---|-----------------------|-------|--------|--------|------------------------|-------|--------|--------|
| | VI (%) | I (%) | SI (%) | NI (%) | VI (%) | I (%) | SI (%) | NI (%) |
| Stable in economics, against economical crisis in globally and nationally | 71.5 | 25.0 | 3.5 | 0 | 74.9 | 20.4 | 4.7 | 0 |
| Democracy | 70.9 | 19.2 | 9.8 | 0 | 71.8 | 23.6 | 4.1 | 0.5 |
| Everyone have the same opportunities in the society | 68.6 | 21.7 | 6.4 | 3.3 | 72.6 | 25.9 | 1.5 | 0 |
| Ecology issue, pollution in the environment, global warming | 65.2 | 31.5 | 2.7 | 0.6 | 74.4 | 21.4 | 3.6 | 0.6 |
| Sustainability of traditional social structure | 63.9 | 19.6 | 15.4 | 1.1 | 66.7 | 25.4 | 6.9 | 0.8 |

Note for abbreviation:

VI: Very Important; I: Important; SI: Somewhat Important; NI: Not Important

The internet, as the most popular social media, is also the easiest way to find out about the whole world, and could be an instrument for the respondent to be involved in globalization. Furthermore, using the internet will erase the distance as a physical barrier to the transferring of information. Nowadays, the internet is involved in daily life, this is also the product of modern globalization, the speed of using the internet could let the youth know exactly what is going on outside, it may have an impact upon youth's attitudes in the globalization era. The aim of this question is to know how frequently do the students use the internet. The result is as below.

Table. 3 Frequency of using Internet

| How often do you use internet | 9 th Grade Result in % | 12 th Grade Results in % |
|-------------------------------|-----------------------------------|-------------------------------------|
| Every day | 98.4 | 100 |
| Several times a week | 1.6 | 0 |
| Never | 0 | 0 |

The table indicated, internet is not popular between both 9th grade and 12th grade students in Kaen Nakhon school, 100% of the 12th grade respondents use Internet everyday.. The educational-purposed WI-Fi are applied in almost everywhere at Kaen Nakhon School, which also offer the easy way for access the internet.

Moreover, currently internet access has become the primary need of the family, supporting education for the young student and also work for the parents. The basic education, from the very early age of children, could also be promoted by internet access. Hence, internet access becomes a primary or basic need for the family and also for the students.

Townsend (1994) explained the impact of globalization is still evolving and uncertain. However, the certain of globalization is characterized by increasing market power and impact to the dangers of power will be abused [8]. The impact from the over hastily of privatization on corporations and companies, less or depreciation of public sector and imbalance between private interests and collective public interest could vulnerable the youth's developing life. The globalization influence could also observe from the young generation way of life, one of them is the type of music they usually hear. Based on this, the questions related the types of music that young students frequently heard is asked. In the questionnaire, the researcher takes 4 kinds of music for the students to select. Which one do you like or which one is your usual choice, the music styles are, pop music, E-san music, Western music and classical music (opera). The result is as below.

Table. 4 Attitude towards the music style

| What kind of music do you usually hear | 9 th Grade Result in % | 12 th Grade Result in % |
|--|-----------------------------------|------------------------------------|
| Pop music | 69.4 | 85.2 |
| E-san music, | 22.8 | 5.8 |
| Western music | 5.5 | 5.9 |
| Classical music (Opera) | 2.2 | 3.1 |

The influence of globalization could also be observed from the young generation's way of life. The spread of music is an impact from globalization, before the social media globalized, the people had little opportunity to know of the music from outside, what they heard every day would be the local music, ethnic traditional music or other kinds of music, which related to their daily life. With globalizations rapid involvement in people's lives, music is not only limited to local music, but also pop music, country music, rock music, etc.

In this study, most of respondents (69.4% in 9th grade and 85.2% in 12th grade) responded that pop music is their favorite music, and 22.8% of the respondents in 9th grade choose E-san music, while only 5.8% from 12th grade select E-san music as their favorite music.

This study also asked the idea and future perspective of the big cities in Thailand, most of the respondents indicated the big cities are modern, fashion, and rich, few of them believe the big cities are boring. Those statistic indicated the positive willing and prespective for the young students' idea towards the big cities such as Bangkok, Chiang Mai, etc.

Table. 5 Big city appraisal

| | SA (%) | A (%) | F (%) | D (%) | SD (%) | SA (%) | A (%) | F (%) | D (%) | SD (%) |
|-------------------------|--------|-------|-------|-------|--------|--------|-------|-------|-------|--------|
| Modern | 82.6 | 11.8 | 4.6 | 1 | 0 | 90.4 | 6.6 | 2.1 | 0.9 | 0 |
| Fashion | 76.4 | 12.7 | 1.9 | 4.5 | 4.5 | 82.2 | 10.1 | 3.1 | 2.6 | 2.0 |
| Innovative | 73.9 | 13.3 | 5.2 | 5.2 | 2.4 | 78.9 | 17.2 | 2.1 | 0.9 | 0.9 |
| Rich | 70.1 | 12.4 | 10.1 | 2.5 | 4.9 | 69.1 | 24.8 | 2.8 | 3.3 | 0.0 |
| Boring | 66.2 | 17.2 | 9.9 | 5.2 | 1.5 | 62.1 | 21.5 | 12.1 | 2.1 | 2.2 |
| Religious | 51.2 | 18.2 | 21.2 | 5.9 | 3.5 | 42.1 | 23.8 | 21.3 | 3.0 | 9.8 |
| Hospitality | 42.2 | 28.2 | 21.2 | 5.0 | 3.4 | 32.1 | 21.2 | 12.4 | 24.2 | 11.1 |
| Have the high socialism | 21.3 | 13.5 | 42.1 | 11.8 | 11.3 | 31.2 | 25.2 | 31.4 | 7.2 | 5.0 |
| Have strong communities | 19.2 | 32.1 | 24.1 | 12.6 | 12.0 | 27.2 | 21.9 | 31.2 | 15.2 | 4.5 |

SA: Strongly Agree; A: Agree; F: Fair; D: Disagree; SD: Strongly Disagree

Currently, global warming is part of human disaster because it is impacted by the human for their exploitation of natural resource and the making of imbalance between ecology and economy needs. In Thailand, the curriculum about global warming already introduce since in the primary schools with the aim to build the awareness of the children to keep taking care and promote balance use between ecology and their way of life. The 9th and 12th grade students ask with the researchers regarding their thought and judgment for global warming impact in Thailand.

The curriculum concerning global warming is already introduced to the students in Thailand, with the aim of building the awareness of the youth students to keep taking care and promote balanced use between ecology and their way of life.

When asked about how global warming will impact on the world, 78.2% in 9th grade and 89.9% in 12th grade respondents agreed that global warming would make the Thailand hotter. It also influences on the second choice which informed the researcher that global warming would impact in the form of drought.

Table. 6 The Judgment of Global Warming Issue

| | | |
|---------------------------------------|------|------|
| | | |
| Will make Thailand more hot | 78.2 | 89.9 |
| Will impact more drought | 87.2 | 93.2 |
| Will impact more heavy rain and flood | 42.1 | 41.9 |
| Will make Thailand more cold | 23.1 | 12.5 |
| Rice products will be decreased | 98.2 | 100 |
| Rice products will be increased | 2.1 | 1.7 |

To strengthen the young students perspective, the researcher also measured their perspective over several themes. In these questions, each student chose their level of agreement regarding ten questions about the personality of their parents' occupation and their daily life.

Table. 7 Personal plan under globalization era

| Questions | 9 th Grade | | | | 12 th Grade | | | |
|--|-----------------------|-------|-------|-------|------------------------|-------|-------|-------|
| | SA (%) | A (%) | F (%) | D (%) | SA (%) | A (%) | F (%) | D (%) |
| After i finish my education, i will be free to have a job which i want | 53.5 | 22.2 | 12.2 | 12.2 | 64.2 | 24.2 | 8.3 | 3.3 |
| It is important to lived in the harmonio us society where everyone always support one to other | 50.2 | 31.2 | 15.9 | 2.7 | 60.5 | 14.4 | 13.9 | 11.2 |
| It is important for me to have a job with less physical activity | 47.2 | 26.4 | 21.9 | 4.5 | 50.8 | 21.6 | 27.2 | 0.4 |
| Food that you buy in traditional market have a better quality compare with supermark et | 42.9 | 21.5 | 31.2 | 4.4 | 42.8 | 21.6 | 33.1 | 2.5 |
| If i am a farmer, i will plant crop which obtain income | 31.3 | 26.2 | 42.1 | 0.6 | 37.2 | 21.5 | 32.7 | 8.6 |

| | | | | | | | | |
|---|------|------|------|------|------|------|------|------|
| for me and family | | | | | | | | |
| Urbanizati on in job matter is the negative impact for social traditional structure and rural society | 21.4 | 33.1 | 41.2 | 4.3 | 31.6 | 31.2 | 25.2 | 12 |
| My job in the future is depend with the need which i could not influence by myself | 15.2 | 13.2 | 61.3 | 10.3 | 21.3 | 26.2 | 52.1 | 0.4 |
| To be a farmer and plant all the food every day is the best way of life | 1.7 | 5.1 | 71.2 | 22.0 | 0.8 | 1.5 | 82.1 | 15.6 |

For the respondents in the from both 9th grade and 12th grade , they did not think that to be a farmer and plant their own food is important, most of the respondents gave the answer of “Strongly Agreed” with less in the agriculture sector. Being a farmer and planting their food for themselves are not their ways of life. From an education perspective, the respondents all agree with the first important option. In their minds, a better education will give them a better chance of a dream career in the future. This may impact on the attitude towards migration.

The data mentioned above pointed to the respondents involved in the globalization era, with the internet offering an easier way to share information outside. The local music will be the last choice for the respondents enrolled with international program. The education perspective, all agreed this to be a strong and important option, migration is positive for the respondents in Kaen Nakahon school as well.

The researcher also asked regarding their future perspective concerning the place they want to lived or stayed. Most of the 9th and 12th grade students choose big cities in Thailand. However, other big cities and other country also become their option for their future place. The thought of teenagers who have future perspective to live in the place that they want is supported by the condition of the environment. One of the possibility because they exposed from the family experiences to work in big cities and other country .

Compare with the number of parents and family member's for the students of 9th and 12th grade, the number are almost the same with the number of students who stated want to work in other big cities and other country.

Table. 8 The Future Perspective of the Place Want to Lived

| <i>Where do you want to live in the future</i> | <i>9th Grade (%)</i> | <i>12th Grade (%)</i> |
|--|----------------------|-----------------------|
| <i>Big cities in Thailand (Bangkok)</i> | <i>76.1</i> | <i>88.2</i> |
| <i>Other big cities in Thailand</i> | <i>21.9</i> | <i>48.9</i> |
| <i>In other country</i> | <i>38.6</i> | <i>41.5</i> |
| <i>In the rural area</i> | <i>1.4</i> | <i>9.2</i> |

Table. 9 Occupation of Parents

| Items | Junior High School (9th grade) | High School (12th grade) |
|---|--|--|
| Parents work (used to work) in Bangkok, etc. big cities | 65.2 | 52.2 |
| Parents work (used to work) in other cities within Thailand | 21.5 | 37.1 |
| Parents work in (used to work) abroad (other countries) | 7.9 | 0.6 |
| Others | 5.4 | 10.1 |

Furthermore, based on the answer from the 9th and 12th grade students regarding working place in other place or working abroad, 65.2% of 9th grade students and 52.2% of 12th grade students stated that their parents used to work/ works in big cities such as Bangkok, Pattaya, etc. in Thailand, those issues impact their selection of future working place.

John Allen and Doreen Massey (1995) argue that globalization occurs in various sectors and fields of activity including telecommunication, finance and culture [9]. Telecommunication frequency of using could also recognize as the impact of globalization among youth, especially in 9th and 12th grade students for this study. Almost 100% of the respondents stated that they use internet from both mobile phone and computer every day, this frequency is higher than the university level (author's another research indicated the internet usage for university level students is 84.4% for every day use.)

IV. CONCLUSION

Globalization, for the Thai people understanding, is not a newly issue. Especially after Thailand set tourism

as their strategic pillar industry, Thailand is becoming much more active in the globalization. The rapid economic expansion and the rapidly migration flow in Thailand have been one of the hot issues in the international community. During the last decades, people's living standard is improving, the increasing of the salary standard give them the chance to go abroad to travel, to study, to get the latest news from outside. Nowadays, the world is more than a community, rather than countries.

The globalization in Thailand generally has the positive impact to the national economy, however, everything has 2 faces, with the economy rapidly growing, and the social media rapidly used people's daily life, to get the information from outside is much more easy than previous time. The place identity, especially the youth people's place identity is changing into negative face. The willing of the youth to move outside of their residence area is strongly enhanced.

The future perspective for the 9th and 12th grade students appear that they prefer work in big cities, rather than develop the rural area. Furthermore, they also prefer work in abroad and get good education level or think that education is the most important for them to have better wealth in the future. Occupation in local place, farmer, is the product of the daily life, also the products of place identity. With the rapid globalized economic growth, the youth in E-san area starting to look for another kind of job which could offer them the high income, high social position, no need the labour work as their parents do now. The outside cities seem more attractive for the youth, especially for the youth who currently lived in the unknown small cities. The loss of place identity, and the loss of traditional culture identity should be pay more attention in the related research.

ACKNOWLEDGEMENT

This research has been supported by Khon Kaen University International College Research Grant. The author would like to extend appreciation to the respondents who participated in this research.

REFERENCES

- [1] Robertson, R. (1992) Globalization, Social Theory and Global Culture. London: Sage.
- [2] Tomlinson, J. (1999) 'Cultural globalization: placing and displacing the West' in H. Mackay and T. O'Sullivan (eds) The Media Reader: Continuity and Transformation. London: Sage

- [3] Devereux, Eoin. 2014. *Understanding The Media*. University of Limerick. Third Edition. London. Sage Publication
- [4] Friedman, T.L. (2000). *The Lexus and the olive tree: Understanding globalization*. New York: Anchor
- [5] Giddens, A. (2000). *The consequences of modernity*. Cambridge: Polity Press.
- [6] Portes, A. (1997). Immigration theory for a new century: Some problems and opportunities. *International Migrant Review*, 31, 799-825
- [7] Wallace, "Youth, citizenship and empowerment", in *Youth, Citizenship and Empowerment*, H. Helve and C. Wallace, eds. (Aldershot, Ashgate, 2001), pp. 11-30.
- [8] P. Townsend, "Ending world poverty in the 21st century", in *Tackling Inequalities: Where Are We Now and What Can Be Done*, C. Pantazis and D. Gordon, eds. (Bristol, The Policy Press, 2000), pp. 211-232.
- [9] J. Allen and D. Massey, *Geographical Worlds* (Oxford, Oxford University Press, 1995)

Linguistic Imperialism: The English/ASEAN Tension

Ms Eleanor Kerfoot

Department of History
University of Warwick
Warwick, United Kingdom
e.kerfoot@warwick.ac.uk

ABSTRACT

In February 2009 the Charter of the Association of Southeast Asian Nations (ASEAN) was officially founded. Article 34 of the Charter states that, 'The working language of ASEAN shall be English'. Today, this shared English language crosses cultural boundaries to unite communities both within and between ASEAN nations. ASEAN and even non-ASEAN countries are now able to trade and communicate on a global platform. This presentation will examine the first historical points of contact between the Eastern and Western worlds to understand how and why English language is so widespread in Asian countries. It will show that European nations introduced English to their Eastern colonies in the late eighteenth century with the intention of controlling and Westernizing the colonised, for political and economic gain. This imperialistic legacy has held fast in the West into the twenty-first century. A study of its history helps us better understand how the relationship between Europe and the ASEAN countries has shifted in previous centuries, from imperialism and political struggle to globalisation and mutual advancement.

Keywords: linguistics, colonialism, power, globalisation, English, Asian, language, discourse, postcolonial

I. INTRODUCTION

The discourse of European rationalism is fundamental to the uncomplicated relationship between '*signifier*' and '*signified*' in the English language. Where 'discourse' refers to the transient or malleable philosophical parameters of grammar, those of Britain and Asia share a common exclusion of the unutterable – Foucault's '*vital frontier*' marking '*what can be said inside a discourse and what cannot*'.² This essay proposes that manipulation of language allowed the British to colonise areas of Asia more absolutely. This practice extended colonial jurisdiction beyond the tangible and into the discursive. The glorification of English language triggered two pivotal stages in the process of colonisation: the discovery and deconstruction of traditional Asian politics and society, and the subsequent creation of a discourse of Orientalism which would justify the 'education of the East'. Language shapes human experience; the deliberate exposure of Eastern countries to Western languages, and vice versa, stimulates a discursive shift. The process of depersonalising a 'native' experience of language was a British endeavour to extract and rework

the latent constructs of Asian languages and their histories.

II. LANGUAGE, DISCOURSE AND POWER

The relationship between language and discourse is inherent. The rationalism of the English language, which is structured around signification, was fundamental to the social and political makeup of post-Enlightenment Europe.³ The Western pursuit of individual freedom, which is secured through willing submission to a democratic government, conflicts with traditional Eastern culture. Asian and European discourses could therefore not coexist in the colonial context without an ideological compromise. Foucault conceives a mutually interconstructive relationship between knowledge and power whereby knowledge must, as a foundation of social and political discourse, shape and be shaped by power.⁴ In the context of colonial India, for example, indigenous Indian forms of knowledge must therefore have been displaced by European ones to consolidate British authority. As the means by which discourses are articulated and constituted, languages were a fundamental aspect of

² Sudipto Kaviraj '*The Imaginary Institution of India*' (New York, 2010) p. 86.

³ Roy Porter, '*Enlightenment, Britain and the Creation of the Modern World*' (London, 1990)

⁴ Michael Foucault, '*Selected Interviews and Other Writings 1972-1977*' (London, 1980)

this process. If education is ‘*the instrumentality through which the common sense of a society is created*’⁵ the British conception of a ‘*new political world*’⁶ within India, and the transition from Indian to European discourses, necessitated the re-education of Indian people. This process aided the colonial movement in two significant ways: it perpetuated an Oriental discourse which justified colonisation to an on-looking Europe, while bringing India under the greater control of the British with the deconstruction of traditional Indian politics.

Of particular interest to the colonial state, and demonstrative of this Indian political deconstruction, was Sanskrit; ‘*a secret language “invented by the Brahmins to be a mysterious repository for their religion and philosophy”*’⁷. Here, ‘mystery’ was indicative of a spiritual ‘otherness’. The significance of ‘religion’ and ‘philosophy’ are particularly noteworthy within this source since it is widely acknowledged that religious and philosophical ideals shape social discourses.⁸ If the spirituality of the Indian people could be understood through their languages, as Dow inferred, their social discourses could be more easily regulated. Cohn suggests that a similar process could be applied to understand political discourses through knowledge of Persian.⁹ Thus, by learning languages such as Sanskrit and Persian, the British achieved a greater, more in-depth understanding of their colonies and, consequently, greater power with the break-down of the less immediate cultural and philosophical histories of India. The process of demystifying Indian languages served to heighten the Orientalist feeling that there was a need to ‘discover’ India, and simultaneously highlighted the logical inconsistencies of the discourse, which was rooted in lack of knowledge and understanding of Indian culture, by challenging its myths.

Particularly notable were Oriental ‘myths’ which opposed European rationalist conceptions of morality and social acceptability. While Asian social and political discourses were being deconstructed by the British and replaced through the teaching of the English language by European ones, an Oriental discourse was spreading. Edward Said describes this discourse as an imagined dichotomy between West and East, educated and uneducated, civilised and barbaric.¹⁰ The discovery of this Eastern ‘other’ furthered the European Enlightenment project. As in the metaphor of Plato’s cave, the Western world sought to redeem the primitive Asian ‘prisoner’ of his ‘*perpetual infancy*’ and irrationality; the ignorant victim is enlightened by a saviour figure.¹¹ This served to justify linguistic imperialism and colonialism, disguising the pursuit of power as pursuit of liberation. The consequence was a continuation of a pattern of European colonial discourse from the early eighteenth century into the twenty-first. If ‘*to know English is to have available a better way of describing the world*’, and to be ‘*endowed with a superior knowledge about the world*’, it follows that English language speakers alone are enlightened.¹² Asian ‘backwardness’ was considered to be brought about, at least partially, by the perceived ‘vulgarity’ of Asian languages, which lacked capacity for reason. To attempt to think in these languages was therefore to be incapable of thinking at all. In the colonial mind, India required ‘rescuing’ from its own ‘ignorance’ through colonisation. Indians came to be seen as ‘*irrational*’ and ‘*bloody*’¹³ ‘creatures’; the inevitable ‘*colonial construction*’ of ‘*Self and Other*’.¹⁴

III. POSTCOLONIAL GLOBALISATION

If language or accent indicate ‘superior’ or ‘inferior’ identities in this way, postcolonial globalisation

⁵ Kaviraj, ‘*The Imaginary Institution of India*’ (New York, 2010) p. 18.

⁶ Kaviraj, ‘*The Imaginary Institution of India*’ (New York, 2010) p. 17.

⁷ Alexander Dow, ‘*A Dissertation Concerning the Customs, Manners, Language, Religion and Philosophy of the Hindoos*’ in *The History of Hindostan* (London, 1792) cited in Cohn, (Princeton, 1996) p.25.

⁸ Michael Foucault, ‘*The Archaeology of Knowledge*’ (London, 1989).

⁹ Bernard, Cohn, ‘*Colonialism and its forms of knowledge: The British in India*’ (Princeton, 1996) p. 22.

¹⁰ Jean Grenier, ‘*Les îles*’ (1993) p.121 cited in Azzedine Haddour, ‘*Colonial Myths: History and Narrative*’ (Manchester, 2000) p. 31.

¹¹ Jean Grenier, ‘*Les îles*’ (1993) p.121 cited in Azzedine Haddour, ‘*Colonial Myths: History and Narrative*’ (Manchester, 2000) p. 31

¹² Alastair Pennycook, ‘*English and the Discourses of Colonialism*’ (London, 1998) p. 157.

¹³ Lelyveld, ‘*Colonial Knowledge*’ (Columbia, 1993) p. 665.

¹⁴ Alastair Pennycook, ‘*English and the Discourses of Colonialism*’ (London, 1998) p. 157.

problematizes traditional European identities. Migration and education dissolve national boundaries and in recent years there have emerged “‘third-world’ or ‘post-colonial’ [intellectuals] (...) from ‘the periphery’ (Africa, India, Australia, Canada)”.¹⁵ There must be exist a European ‘centre’ in order for there to exist a ‘periphery’; an illusion of European superiority is sustained. It is therefore useful to analyse the historical colonial movement in terms of contemporary post-colonialism and linguistic imperialism, as its problematic assumption that language is indicative and productive of a ‘superior’ or ‘inferior’ identity is recognisable even in the twenty-first century. The essential catalyst here lies ‘in the anatomy of the language itself’: the ‘insatiable’ global demand for the English language is ‘a property of the language itself’.¹⁶ Its ‘occult powers’ and the historical context of the Enlightenment – the pursuit of development and the belief in a libertarian utopia achieved through rational thinking – ensure that Western notions of superiority are immortalised by and in the language through which they are articulated.¹⁷ This ‘superiority complex’ motivated colonial discourse.

This most abstract of explanations for the significance of language within colonialism is perhaps the most poignant, particularly given contemporary notions of knowledge of English as a figurative ‘passport’ to the developed and Western worlds. In accordance with Enlightenment ideals of order and control, Britain attempted to compress and restructure Asian discourse in order to make the country governable, deconstructing its national identity by displacing its language. That the language of a nation was so pertinent in shaping its identity was later recognised by Gandhi, who employed traditional Indian languages in order to further the ‘Swaraj’ movement of the twentieth century.¹⁸ In colonial India, the glorification of English allowed European languages to become superior, ‘Oriental’ ones inferior – the ‘native speaker’ and the ‘non-native speaker’ dichotomy.¹⁹ This faced some opposition, and

historians have identified that ‘[Indians] *tried to avoid [English’s] mesmerizing and polluting contact by turning inwards into indigenous discourse*’, arguably their only viable form of defence.²⁰

Language for the British, then, was an almost tangible device for colonisation; an intellectual weapon with physical consequences and a powerful tool for the effective psychological governance of the masses. The sheer size of the Indian demographic, with an exponentially growing population from the 1800s, made problematic any British attempts to achieve Indian colonisation.²¹ The British overcame this problem with a latent form of colonisation through language – one which, within Europe, appeared charitable and noble while simultaneously constructing an Oriental discourse which would prevail into the twenty-first century. This Oriental discourse is effectively constructed of mere myth; a simple ‘representation’ of an imagined reality functioning ‘as a mobilising force for colonist ideology’.²² Arguably, it is the fundamental philosophy behind colonisation itself; a ‘celebration’ of a universal colonist doctrine which ‘drained the culture of the colonised of its history’ – ‘an unceasing haemorrhaging’ of the cultural ‘essence’ of India.²³ A policy of linguistic imperialism, disguised as charity, confronted the cultural landscape and history of a pre-colonial India, reducing it to a state of governable objectivity by denying it the independence of language.

IV. CONCLUSION

It must therefore be taken into account that postcolonial Indian discourse was characterised by an especially European conception of the political world and the interventionist liberalism of the British state, ‘*from whose legitimate interference nothing in society was*

¹⁵ Francis Barker, Peter Hulme and Margeret Iverson (Eds), ‘Colonial Discourse/ Postcolonial Theory’ (Manchester, 1994) p.1.

¹⁶ Burnett (1962) p. 26 cited in Alastair Pennycook, ‘English and the Discourses of Colonialism’ (London, 1998) p. 157.

¹⁷ Sudipta Kaviraj ‘The Imaginary Institution of India’ (New York, 2010) p. 42.

¹⁸ M. K. Ghandi, ‘Our Language Problem’ (Ahmedabad, 1965).

¹⁹ Alastair Pennycook, ‘English and the Discourses of Colonialism’ (London, 1998) p. 156.

²⁰ Sudipta Kaviraj ‘The Imaginary Institution of India’ (New York, 2010) p. 42.

²¹ Aijazuddin Ahmad, ‘Geography of the Asian Subcontinent: A Critical Approach’ (New Delhi, 1932)

²² Azzedine Haddour, ‘Colonial Myths: History and Narrative’ (Manchester, 2000) p. 33.

²³ Haddour, ‘Colonial Myths’ (Manchester, 2000) p. 31-33.

morally immune'.²⁴ It follows that any conclusion drawn by this essay must itself be a victim of the discourses it attempts to define, as a result of both the political standpoint it analyses history from and of the restrictions of its language. Kaviraj argues that 'to understand [colonialism] objectively it is important to stand outside its history; and if that means standing outside its consequences, that is clearly impossible.'²⁵ To attempt to consider colonisation in an objective light is to deny the existence of the very discourses which inspired it. If these discourses are indeed 'immortalised' by the language through which they are articulated, then contemporary historians must analyse colonialism self-consciously. In identifying the English language as one of 'signs and correspondences' rather than Indian 'substances',²⁶ I highlight the crucial and inescapable difference between the two, acknowledging that my own language 'is sometimes derived from, (...) or in dialogic relation with [colonialism] discourses'²⁶ due to its fundamental rationalism, making impossible an objective analysis of British colonialism.

BIBLIOGRAPHY

- Ahmad, Aijazuddin, 'Geography of the Asian Subcontinent: A Critical Approach' (New Delhi, 1932)
- Ashcroft, Bill (ed) 'Post-colonial Studies: the Key Concepts' (London, 2002)
- Barker, Francis; Hulme, Peter; and Iverson, Margeret (Eds), 'Colonial Discourse/ Postcolonial Theory' (Manchester, 1994)
- Cohn, Bernard, 'An Anthropologist Among the Historians and Other Essays' (Delhi, 1987)
- Cohn, Bernard, 'Colonialism and its forms of knowledge: The British in India' (Princeton, 1996)
- Cooper, Frederick, 'Colonialism in Question: Theory, Knowledge, History' (Berkeley, 2005)
- Dow, Alexandar, 'A Dissertation Concerning the Customs, Manners, Language, Religion and Philosophy of the Hindoos' in *The History of Hindostan* (London, 1792)
- Foucault, Michael, 'Selected Interviews and Other Writings 1972-1977' (London, 1980)
- Foucault, Michael, 'The Archaeology of Knowledge' (London, 1989)
- Ghandi, Mahatma, K. 'Our Language Problem' (Ahmedabad, 1965)
- Haddour, Azzedine, 'Colonial Myths: History and Narrative' (Manchester, 2000)
- Headrick, Daniel, 'The tools of empire: Technology and European imperialism in the nineteenth century' (Oxford, 1981)
- Kaviraj, Sudipto 'The Imaginary Institution of India' (New York, 2010)
- Pennycook, Alastair, 'English and the Discourses of Colonialism' (London, 1998)
- Porter, Roy, 'Enlightenment, Britain and the Creation of the Modern World' (London, 1990)
- Richardson, John, 'A Dictionary of English, Persian and Arabic' (London, 1806)
- Said, Edward, 'Orientalism' (London, 2003)

²⁴ Kaviraj, 'The Imaginary Institution of India' (New York, 2010) p. 17.

²⁵ Kaviraj, 'The Imaginary Institution of India' (New York, 2010) p. 39.

²⁶ Bernard Cohn, 'Colonialism and its forms of knowledge: The British in India' (Princeton, 1996) p.18.

Cultural Harmony: Uncovering the Acculturation of Buddhism and Kejawan in Kemiri Village, Temanggung Regency, Indonesia

Ersyah Yulia Nur

Student SI, Historical Education Department

Yogyakarta State University

E-mail: elsa0778@yahoo.com

ABSTRACT

Prior to the arrival of foreign religion (Buddhism), the Javanese community in Kemiri Temanggung had a separate belief called Kejawan. The influence of Buddhism entering at Kemiri Temanggung is very little likely to be well received by the local community, as Buddhism is a new belief that enters in Kemiri. Therefore, Buddhism should be able to integrate with the local culture, in this case with the belief of Kejawan that already been embraced by the community of Kemiri. The purpose of this research is to know the process of inclusion of Buddhism in Kemiri Temanggung and analyze the form of acculturation of Javanese Buddhism on the Kemiri, Temanggung. This research uses qualitative descriptive analysis techniques with data collection techniques in the form of interviews and direct observation. The data obtained were then analyzed using interactive analytical techniques of Miles and Huberman. The result of this research is the process of inclusion of Buddhism in Kemiri begins the inclusion of Buddhism teachings in Kaloran District. Buddhism entered the District Kaloran year 1966. Buddhist leaders who joined in the Representative of Buddhist Indonesia (WALUBI) branch Kaloran District declare Buddhism as an official religion in the District of Kaloran. In 1968, Buddhism came in Kemiri Village. The Pecan Society then adapts and cultivates elements of Buddhism to fit their culture. The sect that developed in the hamlet of Kemiri is the sect of Teravada and Mahayana. The form of acculturation of Javanese Buddhism in Kemiri Temanggung society can be seen in the tradition of Kemiri society. The tradition is the ceremony "Kadeso" statues of Buddha statues Rupang, and haircut. The tradition had already taken place before the influence of Buddhism entered in the Hamlet of Kemiri. Prior to the growing influence of Buddhism in Kemiri, the Kadeso ceremony, the heirlooms, and the haircut tradition had already existed and were practiced according to Javanese tradition using various offerings. After the teachings of Buddhism entered in Kemiri, then the existing traditions were influenced by Buddhism. Without abandoning the elements of Javanese culture.

Index terms: Acculturation, Culture, Buddhism, Java

I. INTRODUCTION

According to Soekanto (2013) acculturation of culture is one or several elements of culture that comes from meeting two or several elements of culture that are interconnected or meet each other. Based on this definition clearly seen demanded the mutual understanding between the two cultures so that there will be intercultural communication process. The greatest religion that can influence for the aspect crosscultural communication is Buddhism. Less religious religion with Islam, Christianity, or Hinduism, the influence of Buddhism on the great civilization. Buddhism was founded by an Indian prince named Siddharta Gautama around 563 BC [4]. Buddhism then spread to large islands in Indonesia including the island of Java through coastal and inland communities.

Kodiran in Koentjaraningrat [1] said the tribe of Java is the largest ethnic group in Indonesia. The people belonging to the Javanese tribe came from the island of Java, especially those found in the provinces of Central Java and East Java. In the area of Javanese culture itself is distinguished between the northern coastal

population and the inland Java region. In the coastal Javanese region more relations of trade relations, fishermen, and Islamic influence are also stronger, so as to produce a distinctive culture, namely "coastal culture". While Java for inland Java, often called "Java Kejawan", in a cultural center located in Surakarta and Yogyakarta. On the island of Java itself spread a very strong Buddhist teachings one of them in the Area of Pecan, Kaloran. The people of Kemiri before receiving the influence of Buddhism they embraced the beliefs of Kejawan. After the influence of Buddhism entered in Kemiri, the people of Kemiri embraced Buddhism. The influence of Buddhism that entered in Kemiri is not directly accepted by the community. People who follow Kejawan belief then embrace Buddhism. After the people embraced Buddhism, traditions that existed before Buddhism came in then acculturated with Javanese culture.

History recorded the teachings of Buddhism entered in Kaloran Subdistrict in 1966. Buddhist leaders who joined in the Representative of Buddhist Indonesia (WALUBI) branch Kaloran district declare Buddhism as one of the official religion in Kaloran District.

Representatives of Buddhism joined in WALUBI inaugurated the Buddhist sect ie, Teravada, Mahayana, and Kasogatan sect. In the declaration, it is agreed that the submission of Buddhism according to its sect to the society. The spirit of running the teachings of Buddhism in accordance with the teachings of the sect is adhered to. The Declaration of Indonesian Buddhist Representative (WALUBI), initiated by nine prominent Buddhist leaders: Raden Wanoro Mangundijoyo (Head of Getas Village), Rusdi (Village Head of Tlogowungu), Samsu Cokrowardoyo (Head of Tleter Village), Marsaad (Kaur of Getas Village Government) Cipto Martoyo (Secretary of Getas Village), Suwarno (Tlogowungu Village Secretary), Sugito (Head of SD Negeri Kaloran), Ngarjo (Head of Police of Kaloran) and Raden Surahmad Mangunsudarmo (Kepala Desa Kalimanggis). Kaloran District is a sect of Teravada, Mahayana, Tantrayana Kasogatan. Currently, Buddhist religious organizations in Kaloran District are the Indonesian Buddhist Representative (WALUBI) and Indonesian Sangha Unity (KASI).

II. METHODOLOGY

This reset using descriptive qualitative whit collecting data from of observation directly in Kemiri Village, Temanggung Regency, Indonesia. Beside that interview deepen doing to one buddishm person in this village who vice at once leader of village about information management which they found. Documentation doing with information system be paid original website, YouTube and searched Google. Beside that channel of social media about FB, IG, and twiter, and another media. After collecting data, and then reduction and generalization and showed by analysis descriptive. Researcher tries to choose Hamlet Kemiri as the location of research because in Hamlet Kemiri there is any acculturation of Javanese culture and Buddhism. Research about acculturation of Javanese Buddhism in Kemiri Temanggung community was conducted from December 2015 until August 2016. The research begins by compiling the study and ending with a paper.

His research processes include observing people in their daily lives, interacting with them, and trying to understand their language and interpretations of the world around them. Therefore, researchers must plunge into the field with a long time. According to Bogdan and Tylor (1993) qualitative research is a research procedure that produces descriptive data in the form of written or oral words of people and observed behavior.

According to them, this approach is directed to the background and the individual as a whole (holistic).

III. RESULT AND DISCUSION

Getas village has an area of 815 Ha. Administratively Getas Village consists of 9 hamlets namely, Dusun Banyuurip, Porot, Gletuk, Krecek, Pringapus, Getas, Nglarangan, Cendono, Kemiri. The Getas Village area includes a plateau with an altitude of ± 700 to 1200 m above sea level with an average temperature of 23 sd 26 °C. The topography of the land is hilly, with rice field area with semi technical irrigation area of 49 ha, rain-fed 30 ha. The total population of the village of Getas as many as 4093 people with a division of the population of 1957 women and 2096 men and is divided into 1,250 families. Kemiri Village is one of Dusun located in Getas Village, Kaloran Subdistrict, Temanggung Regency, Central Java Province [2, 3]

Table 1. The Religions and Its Population in the Getas Village

| Religion | Number of Adherents |
|-----------|---------------------|
| Islam | 330 |
| Christian | 96 |
| Catholic | 0 |
| Hinduism | 0 |
| Buddhist | 446 |

Source: Book Data Recapitulation of Population End of Month Year 2015 Getas Village [2].

The people of Hamlet Kemiri work as farmers, civil servants, traders, and students or students. Most communities work as farmers for agricultural land and plantations. While for the people of Getas Village has diverse educational background. Villagers of Getas who have not been educated 1136 people, elementary school graduates as many as 1465 people, 475 junior high school graduates, high school graduates as many as 199 people, and 47 college graduates [2].

An Aculturation In Kemiri, Temanggung Regency A. Kadeso Ceremony

Kadeso stands for alms deso. The activity is carried out with the purpose of expressing gratitude of Kemiri society to God Almighty. Kadeso ceremony has been going on before the teachings of Buddhism entered in Hamlet Kemiri. After the teachings of Buddhism enter the ceremony Kadeso persist. The ongoing Kadeso ceremony gained influence from Buddhism. The influence is seen in the use of Buddhist prayer is the Thousand Hand Charm. The Thousand Hand Spell

is used in Kadeso ceremonies after Buddhism enters in Kemiri. In addition, the influence of Buddhism teachings is also seen in the division of tasks of Hamlet in Kemiri. After the teachings of Buddhism entered the Hamlet Kemiri there is a Hamlet device called Manggalia. Manggalia is responsible for leading Buddhist rituals and ceremonies in Kemiri Sub-Village. Currently Manggalia Kemiri is held by Mr. Sorok Suryanto.

The elements of Javanese Kebudayaan that exist in the ceremony Kadeso is the use of days and months in the Javanese calendar is the Legion of the month of Bakdamulud. In addition, in ceremony Kadeso Ngunanaken event led by Head of Hamlet Kemiri. Ngujudaken is pronounced by using Java language. Ngujudaken is the core of Kadeso ceremony because, in Ngujudaken event there are goals and needs of Kemiri community in carrying out Kadeso ceremony. After the ceremony Kadeso took place, then proceed with the performance of Art Tayub from Hamlet Kemiri. Art Tayub danced by 8 or 9 dancers and sinden 5 people diringin premises of traditional Javanese music. Then continued by putaji offerings at the fork and crossroads of villages, rivers, and houses. The sensitivity to the invisible dimension is expressed in various ways eg in folk rituals where myths accompany it. The unity of society and nature is practiced by the Javanese in respect of the ancestors. One of them is respect for pepunden as the founder of the village. Kadeso ceremony was held one of them to honor the pepunden figure of Dusun Kemiri Eyang Tri Mangku Sukma.

B. Jamasan Rupang Buddha Statue

Jamasan statue of Budha Rupang is one of the tradition of the people of Hamlet Kemiri in the month of Suro. The statue of Buddha Rupang is performed in a monastery located at Pertapaan Watu Payung. The hermitage of Watu Statue is a characteristic of the people of Kemiri Eyang Tri Mangku Sukma. The influence of Buddhism that is contained in the activities of the statue of Buddha Rupang is the use of Rupang Buddha statue as an object dijamas. Before the teachings of Buddhism entered the Hamlet of Kemiri, Kemiri people ran the heirloom kris heirlooms of Eyang Tri Mangku Sukma, after the teachings of Buddhism entered the community of keris heirlooms of Eyang Tri Mangku Sukma and Rupang Buddha Statue. The statue of Budah Rupang is a statue of the gift from Mr. Marwoto, a figure who spread the teachings of Buddhism in Hamlet Kemiri in 1968. The prayer in the statue of Buddha Rupang is Om Omaha bodhi test.

The elements of Javanese culture that exist in the activities of the Buddha Rupang sculpture is the jamasan held on the stairs 1 Suro. Date 1 Suro for the Java community is a sacred date, on that date the Javanese people sanctify or menjamas heirlooms. The sculpture of Buddha Statue has the purpose of cleansing everything that is not good. The statue of Budha Rupang for the people of Kemiri is a sacred object because it is a gift from a Buddhist figure in 1968. Jamasan Rupang Buddha Statue also uses uborampe which is used by Javanese society such as, tumpeng, ingkung, jajan market, jenang abag putih, polo gumantung. The jamasan ceremony in Hamlet Kemiri is a legacy of the trust of Kejawen.

The people of Hamlet Kemiri to this day still carry out the ceremony jamasan. However, the core purpose of the jamas has shifted the value of the appeal to the ancestors to respect the ancestors. Jamasan kris heirloom Eyang Tri Mangku Sukma and Rupang Buddha statue can be interpreted by the people of Java as a tribute to the ancestors. Javanese ancestors always immersive self-awareness teachings, namely: aja dumeh pinter, tumindake keblinger (do not pretend smart, then his wisdom deviates from the rules should), aja dumeh kuwat dashing lan, tumindake sarwa rash (do not pretend strong and dashing ago His actions are rash or arbitrary themselves), aja dumeh sugih, tumindake lali karo wong fragile (do not pretend rich, then his actions do not remember those who are weak economy).

C. Cut Hair Gombak

The tradition of haircut in Kemiri has been going on from generation to generation. A child when the birth of her hair is not cut until the age of 7 years naturally the child's hair becomes a lump. Prior to the growing influence of Buddhism in Kemiri, the tradition of haircutting has been established and practiced according to Javanese tradition using various offerings. For the people of Hamlet Kemiri, haircut means interpreted as a way to eliminate sukerta. In order for children to survive and run a better life in the future. Various uborampe and offerings complement the process of haircutting. Uborampe is a chicken egg, kupat output (rice kapitelon), jadah, offerings, tumpeng and ingkung.

The process of cutting hair in Kemiri has now been done with a combination of Javanese culture with Buddhism. Both of these influences then colored the process of cutting the hair of gombak. Not just anyone can cut hair hair, in Kemiri cutting hair done by village elder Mr. Marwoto. The influence of Buddhism is seen

with the special use of Buddhist prayers in the Gombak hair-cutting event. In addition, the elements of Javanese culture seen with the use of uborampe in the form of cone, ingkung, kupat out, and offerings. Javanese people use offerings as offerings to ancestral spirits.

The Javanese regard nature as the dominating power of its life [5]. Nature is the expression of power that ultimately determines human life. Humans have a dependence on nature and the magical dimension. Sensitivity to the invisible dimension is found in various ways, for example, in folk rituals where ancient myths always accompany it. The unity of society and nature is practiced by the Javanese in respect for their ancestors. People visit the tombs and petilasan, one of which is the respect for pepunden as the founder of the village. Thus, the Javanese people feel that the world is a place where their well-being depends on the success of adapting to the existing forces of nature. One of the most important religious rituals in Javanese society is selamatan.

VI. CONCLUSION

The process of inclusion of Buddhism in Kemiri begins with the inclusion of Buddhism in the District Kaloran. Buddhism teachings entered in Kaloran Subdistrict in 1966. Buddhist leaders who joined in the Representative of Buddhist Indonesia (WALUBI) branch Kaloran District declare Buddhism as one of the official religion in Kaloran District. In 1968 Buddhism came in at Kemiri. The teachings of Buddhism by the Kemiri community are not immediately accepted fully, because the Kemiri community already has the beliefs of Kejawen passed down from generation to generation. The Pecan Society then adjusts the elements of Buddhism to fit their culture. This shows that the Indonesian nation, especially the community of Kemiri has local genius. The sect that developed in the hamlet of Kemiri is the sect of Teravada and Mahayana.

The form of acculturation of Javanese Buddhism in Kemiri Temanggung community can be seen in the tradition of Kemiri society. The tradition is the ceremony Kadeso (alms deso), statues of Buddha

statues Rupang, and haircut. The tradition had already taken place before the influence of Buddhism entered in the Hamlet of Kemiri. Prior to the growing influence of Buddhism in Kemiri, the Kadeso ceremony, the heirlooms' heirlooms, and the haircut tradition had already existed and were practiced according to Javanese tradition using various offerings. After the teachings of Buddhism entered Kemiri later, existing traditions gained influence of Buddhism. Without abandoning the elements of Javanese culture.

ACKNOWLEDGMENT

This research is fully supported by historical education department, research institution yogyakarta state university (LPPMP) for the improvement activity of writing scientific articles and international publications. Attendance in this conference is fully funded by International Office for Academic student and permitted by the Dean of Faculty of Social Science, Yogyakarta State University. The hope of this research can be useful for academic, campus and society in the realm of history especially about Buddhism in Indonesia.

REFERENCES

- [1] Koentjaraningrat, *Kebudayaan Jawa*, Jakarta: Balai Pustaka, 1982.
- [2] Pemerintah Desa Getas, *Buku Data Rekapitulasi Jumlah Penduduk Akhir Bulan*, Temanggung: Pemerintah Desa Getas, 2015.
- [3] _____, *Daftar Isian Potensi Desa atau Kelurahan*, Temanggung: Pemerintah Desa Getas, 2015.
- [4] Samovar, Larry A. 2010. *Komunikasi Lintas Budaya*. Jakarta : Salemba Humanika.M. Young, *The Technical Writer's Handbook*. Mill Valley, CA: University Science, 1989.
- [5] Soekmono, *Sejarah Kebudayaan Indonesia Jilid I*, Yogyakarta : Kanisius, 1973.

The Local Wisdom of The Sakai Tribe in Mandau, Bengkalis Regency in Preserving Forest and River : Symbolic Interactionism

Fina Musta'ina, Muhammad Sandra, Ikhsan Hidayat, Siti Kuramin, Fanji Suteja, Mita Rosaliza

Universitas Riau

Pekanbaru Riau, Indonesia

E-mail: finamustaina@ymail.com; Muhammad.ksandra@student.unri.ac.id; Ihsanhurairoh@gmail.com; siti.kuramin2246@student.unri.ac.id; Fanji.suteja@student.unri.ac.id; mita.rosaliza@lecturer.unri.ac.id

ABSTRACT

Local wisdom is the source of knowledge applied in the life of community. Indigenous people are usually use in dealing with natural condition to fulfill the needs in its social structure. Sakai tribe, one of the proto Malay group who inhabits Mandau are in Bengkalis region, Riau Province. These People have loval wisdom in preserving forest and river. Their local wisdom is full of values which because their guidance to behave and interact with the environment. These Sakai people have meaningful structural symbols and sacred rituals to keep the forest and river. From symbolic interactinist perspective which is used to analyze the local wisdom of the Mandau Sakai tribe. It proves that the Sakai people conduct *Menyorong*, *Menggalo mosik* rituals in keeping the nature and *Batin*, *Antan*, *Tongkat* and *Monti* have important roles in guiding the people in social cohesiveness to keep the foret and river.

Key words : Sakai Tribe, Local Wisdom, Symbolic Interactionism, Forest and River

I. INTRODUCTION

Riau Province is a province with a high level of Malay culture and tradition. The fact that in this region to date, there are still a number of indigenous Malay tribes can be seen from the history and culture that developed in the province of Riau. In addition to the strong roots of Malay culture in the province of Riau, there are also tribes called alienated or better known as the tribe, such as Sakai, Bonai, Talangmamak, Kubu, Hutan, and Petalangan Riau. Then there is the Sea tribe or Akit tribe who inhabit Riau Islands area. It should be noted, however, that the terms "isolated or underdeveloped tribes" are not used anymore to appreciate and support their progress. In the Riau region there are also indigenous people like *rantau nan kurang oso duo puluo* in Kuantan, *limo koto* and *tigo boleh koto* in Kampar, and others. A number of historical relics (temples and other artifacts) are found to provide clues as well about the existence of ancient culture and civilization in Riau, from pre-historic to Hindu and Buddhist periods. Some scientific studies have even suggested that the Sriwijaya empire once stood in the region. The life of the Malay tribe has a benchmark of social life embodied in customary rules. In the life of indigenous tribes in Riau (such as the Sakai, Bonai tribes, Talangmamak tribes, Kubu tribes, Hutan tribes, Petalangan tribes and Tribes of the Sea or Akit tribes) seem very traditional, as they firmly adhere to their

customs, cultures and traditions . Customary holder like Patih and Batin, very big role in managing all deeds and life. A very simple mind and a life determined by nature, has led to the emergence of traditional figures such as shamans, bomo, handler, and man. These figures are expected to make a good relationship between man and his nature. Indigenous peoples also believe in rivers, lands, trees, animals, and so on, which are inhabited or guarded by spirits whose abilities are beyond man's ability, so they assume that human beings, nature and spirits are an inseparable unity.

One of the tribes in particular which becomes the topic of discussion in this study is Sakai tribe, who relyes their lives from nature. Their development in their livelihood comes from forests and rivers, so the customary law they bear based on the forests and rivers. With the widespread fire of forests in Riau so decades have resulted in Riau emergency smoke due to illegal logging and logging by irresponsible parties, and river pollution caused by the opening of several companies that violate the rules in the management of nature, especially rivers. Two things are forbidden for the Sakai community. Sakai people have their own way of managing forests and rivers, living in the jungle demands certain rules in managing forests and rivers,

because forests and rivers are source of livelihood for them. In addition, for them the forests and rivers have mystical and magical powers that must be preserved and preserved. For that reasons researchers are interested to find out about the local wisdom of the Sakai tribe especially in protecting forests and rivers by the Sakai community.

The Importance of this study is the life meaning with the forest and river for the Sakais society while the contradiction is the threatening existence of the Sakai community tribe associated with forests and rivers because of the logging and logging of forests and rivers that begin to contaminate causing their natural destruction extinction, Along with it as well as sample samples of them in conserving forests and rivers. The importance of caring for nature.

II. LITERATURE REVIEW

In this study the researcher uses the symbolic interaction theory of the thinking of George Harbert Mead (1863-1931). This theory emphasizes the relationship between symbols and interactions, as well as the core of the view of this approach is the individual. According to the symbolic Interaction theory, social life is essentially human interaction with symbols, they are attracted to human events using symbols that reflect what they mean to communicate with each other. The influence arises from the interpretation of these symbols on the behavior of the parties seen in their interactions. The term symbolic interactionion according to the Bumer is as follows:

The term symbolic interactionism refers to the peculiar nature of human interaction. Its peculiarity is that human beings mutually interpret and define their actions. Not just a mere reaction of one's actions against others. But based on the "meaning" given to the actions of others. Interaction between individuals between users of symbols, interpretations by mutual attempts to understand each other's intentions of action. So in the process of human interaction it is not a process where the stimulus is received and the response that occurs afterwards between the process of interpretation by the actor. Obviously this process of interpretation is a thinking process which is a capability that humans possess. The intermediate interpretation process between stimulus and response occupies a key position in the theory of symbolic interactionism. Shared actions capable of forming such structures or institutions may only be caused by a symbolic

interaction, which in conveying the meaning of using cues and language. Through meaningful symbols, symbols that have meaning, objects that are constrained and interpreted, through the process of interaction those meanings are conveyed to the other party. For Blumer symbolic interactionism rests on three assumptions, namely:

1. Man acts against something on the basis of the meanings that the things possess for them.
2. Those meanings are the result of social interaction in human society
3. Meanings are modified and handled through a process of interpretation used by every individual in his involvement with the signs he faces.

III. METHODOLOGY

This research uses descriptive qualitative method, which is a research that aims to know and describe certain social phenomena and try to analyze it in accordance with the data obtained. This research took place in residential research location in Mandau Sub-district, Bengkalis Regency, Riau Province. Sakai tribe lives in Mandau Subdistrict and now they have customary forest located in the village of Kesumbo Ampai and in Petani Village. This area is one of the areas dominated by the Sakai Tribe. The data in this study is divided into two, namely Primary Data, data that can be in the field the research take place. Secondary data, existing data such as articles, Journals, forest and river-related stakeholder data.

Data collection techniques that will researchers use in this study are as follows. Sample technique used is Purposive Sampling determination of sample with certain consideration. The research subjects chosen as key informants are Head of Bathin of Desa Petani and Desa Kesumbo Ampai, Mandau Subdistrict, Bengkalis Regency, Riau Province with 5 respondents consisting of Batin Desa Kesumbo Ampai, Batin Potani Village, Secretary of Potani Village, Mandau District Staff, 2 Sakai youths.

As for the procedure in conducting this research, the researcher uses the following steps:

In-depth Interview (Indepth Interview)

Interview method is a form of verbal communication or conversation with the intention of obtaining information

from the object. Interviews were conducted by two parties, the interviewer who applied for the money and the interviewer who gave the answer to the question. Interviews are used to communicate with research subjects to obtain the necessary data. This in-depth interview technique was obtained directly from the research subjects through a series of question and answer with the parties directly related to the subject matter. In this study interviews were conducted using guided free interview guidelines.

Observation

Observation is a technique or a way to collect data in the field by looking and observing carefully in order to obtain accurate data. Observations were done by direct observation that included observations of the activities of the Sakai community

Documentation Study

The Documentation Study is a data collection technique that is directly aimed at the subject or sample of the study, but through the document. Documents used can be documents such as references and library books, journals, newspapers.

Processing Techniques and Data Analysis

The technique used in this research is a qualitative analysis technique, where it is based on some opinions which states that data analysis is the process of giving meaning to the data. The researcher will search for respondents based on certain criteria, then interview them. Thus the analysis of the data is limited to depth, description and decomposition in depth and systematic about the actual situation. Until it comes to conclusions and gives inputs or suggestions.

In addition, to obtain valid and structured data the researchers refer to the concept of Milles & Huberman (1992: 20) is an interactive model that classifies data analysis in three steps, namely:

Data Reduction

Data reduction is a sorting process, focusing attention on simplification, abstraction and rough data transformation arising from written records in the field.

Data presentation (Display Data)

This data is structured in such a way as to provide the possibility of drawing conclusions and taking action. The usual form used in the previous qualitative data is

in the form of narrative text, associated with display data, researchers present it in a table.

Conclusion (Verification)

This research will reveal the meaning of the data collected. From the data it will obtain tentative conclusions, blurred, rigid and dubious, so the conclusion needs to be verified. Verification is done by looking back at data reduction and display data so that conclusion taken not deviate.

Findings and discussion

Overview of research location.

The research was conducted in one sub-district in Bengkalis District in Mandau Sub-district, focusing on two Villages: Desa Petani and Desa Kesumbo Ampai, which are included in the Mandau sub-district administration.

Mandau Sub-district geographically has the following limits:

- North by the District of Bukit Batu and Dumai City
- East by the District of Bukit Batu
- Regency of Pinggir in the south
- Regency of Rokan Hulu in the west

Mandau sub-district lies between $0^{\circ} 56'12''$ LU - $1^{\circ} 28'17''$ LU and $100^{\circ} 56'10''$ BT - $101^{\circ} 43'26''$ East, with its capital at Air Jamban and the third largest sub-district after Pinggir and Bukit Batu District which reached 937.47. The largest village / kelurahan administrative area is Bumbung Village which reaches an area of 104 km or 11.09 percent of the total area of Mandau Sub-district. The village of Petani is located 10 km from the capital district, while the village Kesumbo Ampai is located 35 km from the district. It takes 4 hours from the provincial capital of Pekanbaru to Duri Mandau Sub-district, then after going through the administration of new research permits, the researchers had to take 45 minutes from Mandau Subdistrict to the Farmers Village to dig up the initial information, after which the researcher suggested to see the inner roof of Mr. Orphan Bathin Iyo Bansa in the village Kesumbo Ampai with travel time about 45 minutes to the East Village Farmers Village.

IV. DISCUSSION

Tribal history

According to Indonesian archaeologists van heerken (1995) and soekomo (1957), before the existence of a population belonging to the Malay race in the Indonesian archipelago and Malaysia, in fact there were already inhabitants belonging to the wedoid and austroloid races. These two races lived from hunting and gathering forest plants. According to Wide (1972), Sakai people classified as having traits of wedoid and austroloid races. And also Lebar also mentioned that Sakai people are the same as those who live in the province of Jambi, But the supplements do not agree with the wide opinion. There are allegations that the population is classified as wedoid and austroliod racial, and then pushed into the interior area and forest by a bunch of people who came later (2,500-1,500 BCE) classified as proto melayu race. The arrival of the next gang that belonged to the deep-rooted deutro race (300 years BC) urged the people to smell the depth, so there was mixing of people with traits, wedoid and austroloid races with malay proto races. Disaping people proto melayu who self-implants kepedalaman there are also living side by side and mixed with people from the deutro melayu race.

In historical record Riau it is informed that this region was once in the power of the kingdom of sriwijaya and work of malay. In addition, with the arrival of the nations of China, Portuguese, English and Dutch who trade, and Even the Dutch had time to dominate and colonize Indonesia, there are remnants of the influence of Hindu culture, islam, china, and west especially the Dutch culture. In general, Islamic tradition is the strongest of all other cultural traditions The history of the tribe has many versions, according to Moskowsky (1908) and later also quoted by loeb (1935) The Sakai people are Veddooid people mixed with Minangkabau people who came migrating around the 14th century to Riau, namely to Gasib, on the edge Gasib river in the upper Rokan river. The fate then became an Aceh kingdom, and these people fled to the forests around the Gasib, Rokan, and Mandau rivers and all the Siak rivers. They were the ancestors of the Sakai people. Meanwhile, according to information from Mr. Boechary Hasny (1970) who obtained information about the origin of the Sakai people from the parents Sakai, and also according to the information of the father of Saepel, former Batin Beringin, Sakai derived

from Pagaruyuang, Batusangkar, and from mentawai. Mr Muhammad Yatim we interviewed, a former shoot of Mandau, said that the tribe Sakai is the oldest tribe in Sumatra which is the embryo of another tribe he rejects that Sakai comes from Minang or mentawai. The word Sakai, according to Moszkowski (1911) connotation is humble and obnoxious because it has the meaning of the uncivilized and the "slave", therefore Sakai people prefer to be called and call themselves "Batin". According to the father of Muhammad Yatim, we interviewed, Sakai means "sakti", But he also said that Sakai is derived from the Japanese language that Sakai is immune. Sakai derived from the Japanese language related to the period of Japanese occupation. Seeing the romushas imported from Java to work on installing oil pipes, the Sakai tribe aims to help save the romushas until the war between the Sakai and Japanese tribes takes place. In the war, Sakai leader who has immunity can not be hurt by the Japanese army. Until the Japanese army called them "Sakai" which means immune or strong.

Sakai Community Livelihood

Sakai's livelihood includes activities:

1. Finding and collecting forest products.

Sakai's original activities in the past include finding and gathering forests in addition to hunting, farming, fishing, and honey-seeking. The activities of searching for forest products cover the activities of collecting fungi, forest fruits, such as pauh (*mangifera indica* L), rambutan (*Nephelium rapoaleum*), jackfruit (*artocarpus heterophylus* Lmk.), Cempedak (*artocarpus cempeden*), Durian (*Coelostegia* spp), rattan *Calamus caesius*), resin (*parashorea stellate*), gaharu (*santalum album* L.), tampoi (*Aglaia eusideroxylon*), kepau (*Polychantus hasetti*), and bee honey (*apis dorsata*). If these types of forest products are present in large quantities, They will collect as much as possible then stored at home, as a material reserve when experiencing panceklik inventory. And then to be sold to wholesalers in Duri market. Among the forest products collected and then sold are rattan (*calamus caesius*), resin (*parashorea stellate*), jelly sap (*dyera costulata* hook f), incense (*dioscorea puri folia*) and wood bosi (*santalum album* L), but but forest products that have been Mentioned has begun to decrease due to the exploitation and clearing of oil palm plantations.

2. Sedentary cultivation.

Cultivating is part of the way to survive and to eat. In situations of farming the community build houses in their fields to farm. A lading is usually built from a nuclear family and built in a mutual way and helps each other between families, two to five families. In addition to farming to produce food. Tribe Sakai community has a special food, namely Manggalo Mosik (Manggalo Mersik) Toxic cassava into a traditional food Sakai community, which became a typical food Sakai. Eaten when brought in the field, which serves to emngganjal stomach so as not to starve.

3. Hunting, Catching fish and looking for honey.

The genuine Sakai community activities are hunting activities in (Hunting) and gathering (Gathering). While the activity of farming is the influence of Malay culture which disisoalisasikan by kings siak sri inderapura to Sakai community. The hunting notion for the Sakai community is not the activity of hunting or killing animals hunted by firearms, but rather encompassing the activities of ensnaring and catching wild animals that live in the forests of the Sakai community. Their hunting tool is primarily a spear, kojouw. Here are examples of animals hunted and trapped like Deer (*Cervus unicolor equimus*), Kancil (*Tragulus Sumateranicus*), deer (*maticus muntjak*), wild chicken (*gallus Varius*), pig, (*sus scrofa*). In addition to wood forest products, hunting animals, honey is also one of the natural products that are useful for Sakai society, namely for the system of treatment and for daily drinking.

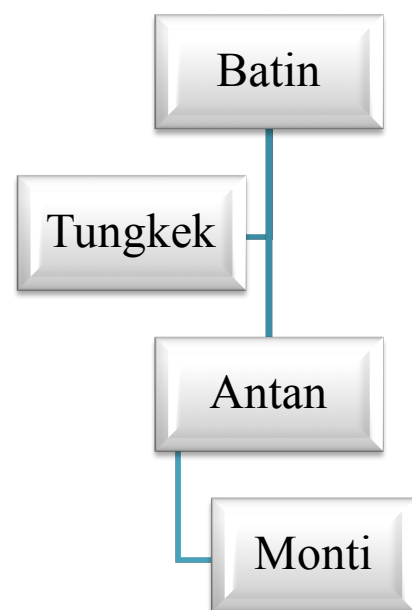
Sakai Traditional Density Structure

In the community kebathinan Sakai has a structured government structure, called "Sakai Traditional Density" headed by A Bathin which aids by Tungkek, Antan and Monti. Each of them has a special function in performing their duties. In the past Tongkat (tungkek) consisted of four people, namely:

1. Jupantah Jelantah, in charge of maintaining Suak (Natural kelstarian, river, forest, sacred place and set boundary of river and forest products).
2. Sao money serves as a mental schema, to read and write if there is any news or letters coming from outside.

3. Taman Kayo Money, serves to regulate the rights and obligations of children and kemanakan regarding the division of inheritance, land perbathinan, matters of death and misfortune.
4. Medium Tungkek datuk bendaharo, regulating customary law issues, concerning marriage, art, silat, important ceremonies, and traditional dance ceremonies.

Every tungkek has an antan. Antan-antan duty as a relation in forward order to the citizen Sakai tungkek. Antan-antan in carrying out the task assisted by a monti. Monti is the bottommost element of the matter, regulating the technical issue of Sakai culture. Such as to convey news to the community Sakai to gather or to perform the ceremonies.



In the ownership of customary forest forests, the tribe Sakai divides the area of residence based on the inner group. Perbathinan in tribe Sakai is divided into two namely

Inner bath and inner limo,

- Batapan delapan is made up of inner sobanga, inner botuah, batin bumbung, inner somunai, batin tongonong, sutan pinggi, inner sutan botuah, batin bomban soi pauh.

- While the limo in the form of bomban minas, inner

bolutung, inner samsam, boingin sutan, and inner ponaso.

Each bathin has an ulayat forest land that can not be disturbed, the forest possessed every soul has a limit and pengurus (waiter) until there is no dispute between the inner region. Signs or forms of land boundaries of ulayat forests such as Roads, Watchers (Tigers, elephants). The relationship of customary customary forest lands based on the inter-growing tree which each inner territory has a meaning and a certain meaning "pancak over the lawang tapak".

Sakai Tribe In Maintaining Forests and Rivers

The life that had always been friendly with forests and rivers made the Sakai tribe arise the nature of dependence. The tribe assumes that they have a strong bond with the forest, or in other terms they refer to the sense of connection. Humans, animals, plants and other inanimate objects are divine beings who must live side by side in harmony and help each other. The ulayat forest land we met in Kusumbo Ampai village still looks beautiful. According to Muhammad Kusumbo ampai, the father of Muhammad Yatim, that the forest in the village's deliberately maintained and guarded from the damage, illegal logging and interests of timber companies in Riau Province. This prevents forest depletion occurring in some villages. As explained by the inner village farmers we interviewed, Mr. Bukhari, that the forest began to decline mainly due to the activities of timber companies and the transfer of forest to plantations.

Forests have significance for the Sakai community, in indigenous tribes Sakai no rules in interacting with forests. Within the tribal leadership structure, there are confidants who take care of and regulate the forests and rivers, the tribe Sakai call it premises Ju Panteh (ruddy river udong pementang). Ju Panteh has a duty in safeguarding the natural resources of the tribe Sakai, if there is a violation it will be given a fine of gold or comparable to one tepak betel. Gold or tepak betel means a reverence for the sin that has been done is a redeemer. Sakai tribe makes nature as a determinant or symbol in everyday life, for example in time determinants, tribe Sakai use the sound of poultry that exist in the forest. The intimacy of the tribe Sakai also they keep with animals in sharing places and food.

Forest management has a binding rule for every tribal community. In order to open up farms, people have to ask permission for the soul, there are several steps that they do in opening the first land Sangkangkar that is looking for and measuring the good land to use, to measure them using the depa or cubit, then is Launching a bar taking a tree trunk for Used for gasing, in indigenous tribes Sakai gasing game implemented before cutting down the tree, the intention of this game to train the arm to be, strong and resistant in cutting woods. Third open the community land has a period of time, 1 year 3 times cut down, burn, and sow the land. Single activities must be done together, one day before the activity of planting seedlings dilahan done ground lethal ceremony whose purpose is to open the land is cold or fertile soil and those who live dilahan maintained from danger mara, secure prosperous, peaceful and healthy Wal afiat. This land-deadening ceremony is carried out by the respective heads of families who both build the neighborhood and ask for protection to "Poti Soi". At the same time, in the middle of the land, the people planted "Jejak Bumi" planted with a lime which is added with the ingredients of the top, flour, rice, duan setawar, leaves sedingin, shell, rotten rice, wooden lesion, wooden painting antan , Balerang and incense. And read the spell which is as follows:

*"Poti Soi
Gemolo soi
Siti dayang sempono
Tuan, engkau nak besuko-suko ati
Kotongah ladang.
Artinya.
" Putri sri (Dewi Sri)
Gembala sri (Penunggu dan penguasa tanah)
Siti dayang sempurna
Tuan, engkau hendak bersuka ria
Ketengah lading*

Managing agricultural land has a productive period so that people usually will switch land fields. Abandoned land should not be disturbed or reused, it is intended that the abandoned land will grow shrubs and occupied by animals that have habitats in the form of small plants. The forest of each bathin has its own distinct characteristic of the ulayat utah that distinguishes that there are forest forests in different forests of different kinds of forest such as in the village there is a Sialang tree (honey bee tree) and in the village of kusumbo there is a sialang tree but the species Different from the

division of the forest if sebagai example in the forest area kusumbo ampai grow sialang tree type sarahang sebanga tree if it happens then the result of the bee tree hive that if honey harvesting honey must memjin permission to the inner sebanga if batin sebanga agree new honey harvest The intention of the tree was that to bind each other inner groups, mutual sharing and mutual respect. According to the inner father Muhammad orphaned forest kusumbo ampai never researched by the company HTI (Indonesian Soil Forest), there are all types of Indonesian plants therefore the inner mensakralkan forest to be on guard kelestariannya no one to invade the jungle forest.

According to the mind of Muhammad orphaned in the forest there is a river, the river passes through several areas of the forests and the river is the possession of all inner researcherity therefore the river is treated with the whole group of Sakai, the fish taking in the river is only done once a year called (Washing fish) or harvesting fish in the river, 3 days before washing the fish should not be contested, this banned ban is called Malay. For example, take a leaf of a river on the edge of the river, or do things that can damage the nature around the river. Abstinence of this ban intended to within 3 days in order to get approval from the river guard at once so that the river contains available if after 3 days then the community wants to take the results from within the river. Then just do the way to wash the fish, with a little menuba but can die all the fish that are in the flow of the river by way of recited the mantra and if the fish is dead start to harvestakan harvest the fish.

V. CONCLUSION

The history of the Sakai tribe has many versions, according to Moskowsky (1908) and later also quoted by loeb (1935) Sakai people are Veddoid people mixed with Minangkabau people who came migrating around the 14th century to Riau, namely to Gasib, on the edge Gasib river in the upper Rokan river. Sakai's livelihood includes activities, searching and collecting forest products, Moving on land, Hunting, catching fish and looking for honey. The Sakai kebathinan community also has a structured structure called "Sakai Traditional Density" which is headed by a soul that aids by antan-antan, stick and monti. Each tungkek has a special function in carrying out its duties .. In keeping the forest and river community synergize with the soulin, with the holding of some ritual ceremony and patang banned, to open the forest must stamp means to measure the tread

of land or ladnag that want to be opened then Laih A piece of wood to be used as a top to be played which aims to make strong hands while cutting down a tree. Likewise in taking the results of the 3-day river is denied to mean it, should not melayukan leaf, or damage the existing nature around the river, after that just menuba fish. Once the traditional customs, traditions owned by the tribe community so that the forest and the river that is owned awake keasriannya. The tradition of Sakai in managing and preserving the forest can be seen through symbolic interaction. The tribe interpreted every forest and its management into a communication and trust which became the basis of the life of density.

IV. REFERENCES

- [1] Desa putra, Syahrial. 2010. Kearifan lokal yang terkandung dalam Upacara Tradisional Kepercayaan masyarakat Sakai-Riau. Tanjung Pinang: Kementerian Kebudayaan dan Pariwisata
- [2] Dewi Wulansari. 2009. Sosiologi Konsep dan Teori. Bandung: PT Refika Aditama.
- [3] Elyati, Henni . Tesis, 2015. kearifan lokal masyarakat Sakai dalam melestarikan hutan dan sungai di kecamatan Mandau. Universitas Riau.
- [4] Hamidy, UU. 1991. Masyarakat Terasing Daerah Riau di Gerbang Abad XXI, Pekanbaru: Yayasan Zamrad
- [5] Iqbal Hasan. 2002. Pokok-pokok materi Metodologi penelitian dan aplikasinya, Jakarta: Ghalia Indonesia
- [6] Johnson, Doyle P, 1988. Teori Sosiologi Klasik dan Modern, Jakarta: PT. Gramedia.
- [7] Kerapatan Adat Bathin Sobanga, Sakai Bathin Solapan Riau. 2012. Historis Islam ditanah Sakai: Desa Kesumbo Ampai, Bengkalis.
- [8] Koentjaraningrat. 1997. Metode-metode Penelitian Masyarakat. Gramedia Pustaka Utama. Jakarta
- [9] Malo, Manasse dan Trisnoningtiyas, Sri., Metode Penelitian Masyarakat: Pusat antara Univeristas ilmu-ilmu sosial Universitas Indonesia, Jakarta.
- [10] Maryanto dwi, dan Sunarto. 2004. Tanda-tanda dalam kebudayaan kontemporer. Jogjakarta: Wicana Tiara.

- [11] Sugiyono. 2014. Metode Penelitian Bisnis. Bandung: Alfabeta
- [12] Suparlan, Parsudi. 1995. - Sakai di Riau; Masyarakat terasing dalam masyarakat Indonesia, Jakarta: Yayasan Obor Indonesia
- [13] Thamrin, Husni. 2003. Sakai: Kekuasaan, Pembangunan, dan Marjinalisasi. Pekanbaru: Gagasan Press.

Analysis of Exchange Rate Fluctuation Using Vector Error Correction Model (VECM) From 2010 to 2015

Fitra Prasapawidya Purna, Puguh Prastyo Mulyo, M Roqi Azza Bima
Email: fitra.prasapa93@gmail.com

ABSTRACT

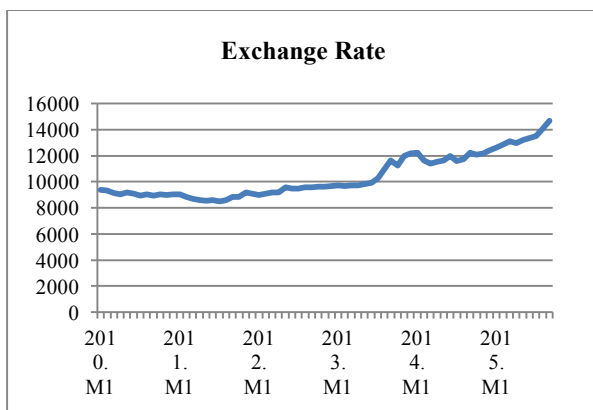
Exchange rate in the last few years has been fluctuating highly. A number of variables were used in this research to analyze which variable has impact on exchange rate. The variables used were export, import, money supply and Bank Indonesia rate, for the period of January 2010 until September 2015, utilizing Vector error correction model or VECM estimation method. The results indicate that in the long-run, some variables such as import and money supply have significant correlations to ER with positive and negative impact respectively, while export and BI rate have no significant correlation to ER with negative and positive impact respectively. In the short-run, all variables bear significant influence on ER except money supply, whereas import, money supply and BI rate maintain a positive relationship with the ER. Meanwhile, export has a negative influence on ER. For impulse response and forecast error variance decomposition, the variable which induced the most shock to exchange rate was import.

Keywords: Exchange rate, Export, Import, Money supply, Bank Indonesia rate, VECM

I. INTRODUCTION

Two thousands and fifteen is the year when exchange rate of Indonesia fluctuated more fluently in the high point. We can't deny the existence of international market that influences the changes of the exchange rate. Especially, when we talk about the upcoming of Asean Economic Community in the end of that year, it should relate to the export and import between countries. The instability of exchange rates will affect the flow of capital or investment and international trade [1].

Such a strong currency is needed to face the obstacles that may occur in the middle of the event. Cause it will not just affect the country but also the citizens even the one who stays in the villages. Even the slightest change can make people suffer or delight. The change of currency value is affected by trade balance with other countries which using the big amount of money especially using US Dollars as its trade's money. A stable currency value indicates that the country has a relatively good economic condition or stable [2].



Resource: Bank Indonesia (calculated) [3]

The changes of exchange rate in these last years can be seen in the graph above as its value fluctuated in the high point through 2013-2015 around Rp12.000-14.000 as before it just fluctuate around Rp8.000-10.000.

Some researcher has conducted their research and published their finding about the influences of variables such as export, import, money supply, Bank Indonesia rate, inflation rate, and others toward exchange rate. Some findings were significant and others not. Such as RR Suci Palasari [4] in her research about the Influence of exports, imports, inflation rate, and the Interest Rate toward Exchange Rate explain the multiple linear regression method that partially exports negative effect significantly, import significant positive effect, interest rates positive and significant on the rupiah. While the inflation rate does not significantly affect and the interest rate is the dominant variable.

By those backgrounds the researcher wants to analyze some variables that can influence the fluctuations of exchange rate, there are export, import, money supply, and Bank Indonesia rate in the period of the data from January 2010 until September 2015. With the title of “**Analysis of Exchange Rate Fluctuation Using Vector Error Correction Model (VECM) From 2010 To 2015**”

II. METHODOLOGY

This study adopted a Vector Error Correction Model (VECM) to examine the relationship between exchange rate and macroeconomic variable in Indonesia. Model developed and applied in this study as follow:

$$ER_t = \sum_{j=1}^n ER_{t-j} + \sum_{j=1}^n EXP_{t-j} + \sum_{j=1}^n IMP_{t-j} + \sum_{j=1}^n M2_{t-j} + \sum_{j=1}^n BRT_{t-j} + \varepsilon_{1t}$$

It aims to examine the long run and short run relationship between Exchange rate (ER) with four macroeconomic variables, namely Export (EXP), Import (IMP), money supply (M2), and Bank Indonesia Rate (BRT). To properly specify the VECM model, this research followed the standard procedure of time series analyses. By following these procedures:

1. Descriptive Statistic
2. Unit Roots Test – Augmented Dickey Fuller Test
3. Lag Length Criteria Test
4. VAR Stability Test – Roots of Characteristic Polynomial
5. Correlation Matrix – Johansen Julius Co-integration Test
6. Pairwise Granger Causality Test
7. VECM Estimation
8. Impulse Response
9. Variance Decomposition Test.

In the detail that mentioned technique will be explain in the following explanation.

1. Descriptive statistic.

Descriptive statistic supposed to figure out research data. Consist of descriptive analysis as follows:

- a. Examining the value of Mean (average)
- b. Examining the value of Maximum
- c. Examining the value of Minimum
2. Unit root test.

The stationary test conducts of the variables to avoid spurious result. There are several methods for testing the presence of unit roots. The most widely used method is Augmented Dickey Fuller (ADF) and Philips-Perron (PP). ADF is applied when the error terms (e_t) are correlated. ADF performed by adding the lagged values of the dependent variable ΔY_t . the null hypothesis for ADF test for unit roots test is $\alpha_1 = 0$ Gujarati (1995). For estimate ADF the following regression is for ADF following:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_t + \alpha \sum_{i=1}^m \Delta Y_{t-i} - 1 + \varepsilon$$

Where ε_t is a white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - \Delta Y_{t-2})$ and so on are the number of lagged difference term which is empirically determined [5]. ADF also has its own critics. Paramaia and Akway (2008) claimed that the ADF test has good size but poor power properties. Meanwhile another test is PP test. This test controls the higher-order serial correlation. PP test use on parametric statistical methods and avoid the use of adding lagged difference terms in ADF test. The null hypothesis for PP test is $\beta_1 = 0$. The PP test is relatively better, but has very poor size in the presence of MA

processes. The following equation represent for PP test [6].

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \varepsilon_t$$

In this test the researcher use a scale of confidence 5%. It means that when the value is under the scale of confidence then the H_a is accepted or there is a stationary from variable.

3. Determining lag length.

The determination of the lag length, used to determine the optimal amount of lag that will be used in a stationary test. If the lag length used in a stationary test too little, the residuals regression will not show the white noise because the model can't accurately estimate the actual error. Consequently, Y and standard error cannot be estimated correctly. But, if input too much lag, it can reduce the ability to reject H_0 , because if adding too much additional parameters can reduce the degrees of freedom [7]. To knowing the right criteria in Stationary test, there is the right criteria to determine lag following:

$$\text{Aike Information Criteria (AIC)} = -2 \left(\frac{1}{T} \right) + 2 (k + T)$$

$$\text{Schwarz Information Criterion (SIC)} = -2 \left(\frac{1}{T} \right) + k \frac{\log(T)}{T}$$

$$\text{Hannan-Quinn Information Criterion (HQ)} = -2 \left(\frac{1}{T} \right) + 2k \log \left(\frac{\log(T)}{T} \right)$$

Where :

- 1 = Value function log likelihood
- T = Total of observation
- k = Parameter are estimated

4. VAR stability test.

VAR stability test conduct to know the stability of VAR variable, because if the VAR variable is unstable the prediction of IRF and Variance Decomposition is invalid. VAR is stable if the modulus value of roots less than 1 (<1) [8].

5. Correlation Matrix – Johansen Julius co-integration test.

The co-integration test conducts to determine whether the time series of these variables display a stationary process in a linear combination. Co-integration means that data from a linear combination of two variables can be stationary despite those variables being individually non-stationary [5]. The Johansen (1991) method of multivariate co-integration is employed. A finding of co-integration implies the existence of a long-term relationship between the dependent and the independent variables. If there is at least one co-integration relationship among the variables, then the causal relationship among these variables can be determined by estimating the VECM.

The Johansen and Juselius method uses two test to determine the number of co-integration vectors [9], namely the “Likelihood Ratio Trace test-LRT” and the “Maximum Eigenvalue test-ME” The likelihood trace statistic expressed as :

$$LRT = -T \sum_{i=1}^n \ln(1-\mu_i)$$

For this null hypothesis, it is said that the number of co-integration vectors is less than or equal to r , in which r is 0,1,2,3,... So on. The alternative hypothesis against this is that $r=n$. Meanwhile the Maximum Eigenvalue test is formulated as:

$$ME = -T \ln(1-\mu_t)$$

The null hypothesis is that the existence of r co-integration vector and the alternative hypothesis is $r+1$ co-integration vectors. The scale of confidence that used in this research is 5%, it means that when the value under the scale of confidence then H_a is accepted or there is a co-integration between variables.

6. Pair Wise Granger causality test.

According to Granger (1988), the existence of co-integrating vectors implies that granger causality exists at least in one direction. A granger variable causes the other variable only if it assists its future value. In co-integrated series variables might be share similar stochastic trends. This research conducts Granger causality test to look for directional relationship among variables.

Gujarati [5] stated that, there are three Granger interpretations: first unidirectional causality, second bilateral causality and third independence causality. Unidirectional causality occurs if dependent variable lag coefficient is significant while all independent variable lag coefficient is zero. Bilateral causality occurs if all lag coefficient of both dependent and independent variables are significant.

The scale of confidence that used in this research is 5%, it means that when the value is under 5% then H_a is accepted or there is effect from on variable to another variable.

7. Vector Error Correction Model (VECM) estimation.

Vector Error Correction model (VECM) is a restricted VAR designed for non-stationary series are known to be co-integration. VECM has co-integration relation built into specification cause of that it restricted the long-run behavior of the endogenous variable to converge to their co-integration relationship while allowing for short run adjustment dynamics. The co-integration term is known as the error term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustment. Consider a two variable system with one

co-integration equation and no lagged difference terms. The co-integration equation is:

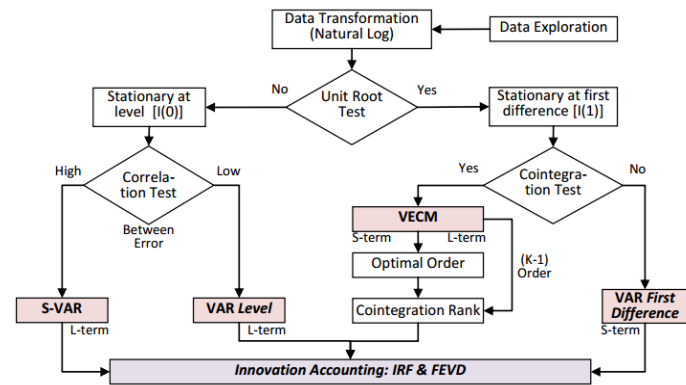
$$y_{2,t} = \beta y_{1,t}$$

The corresponding VECM is:

$$\Delta y_{1,t} = a_1 (y_{2,t-1} - \beta y_{1,t-1}) + \varepsilon_{1,t}$$

$$\Delta y_{2,t} = a_2 (y_{2,t-1} - \beta y_{1,t-1}) + \varepsilon_{2,t}$$

The only right side variable is the error correction term. In long run equilibrium, the term is zero. If y_1 and y_2 deviate from the long run equilibrium, the error correction term will be nonzero and each variable adjusts to partially restore the equilibrium relation. The coefficient a_i measure the speed of adjustment of the i -th endogenous variable towards equilibrium.



Source: Gujarati [5]

Figure 2. VAR Process Analyses

The level of confidence that used in this research is 5%, it means that when the value is fewer than 5% or the value of t-stats more than t-table which the value of t-table is 1.67 then H_a is accepted or there is significant impact from the variable.

8. Impulse response.

For the function of IRF expectation k-period ahead and the error prediction variable cause the innovations of others variable. Thus the duration effect shock of a one variable to others variable until the effect of shock is disappear or return to equilibrium can be seen and knowing [7].

9. Variance decomposition.

Variance Decomposition or also *Forecast error variance decomposition* is a device on the VAR model which separates the variation of the number variables in the estimate into its component parts into a variable shock or innovation, with the assumption the variable not mutually correlated. Then the variance decomposition will provide information on the proportion of the movement the shock effect to the shock on others variables in the current period and future periods [7].

III. RESEARCH RESULT

This part will explain the findings from the research and some explanations through the data that has been analyzed and will reveal all things according to the research.

1. Descriptive statistic.

Descriptive statistics represents the entire population or sample in the study. It explains data central tendency and dispersion measurement. Eviews 7 is used as the econometrics tool to analyze the data. Eventually, this study finds the following descriptive statistics:

| | ER | EXP | IMP | M2 | BRT |
|-------------|----------|-----------|-----------|----------|-----------|
| Mean | 10390.62 | 15018.52 | 13338.89 | 320090.8 | 6.684783 |
| Median | 9615 | 15340.48 | 13986.65 | 320790.8 | 6.5 |
| Maximum | 14657 | 18530.80 | 16749.95 | 450860.3 | 7.75 |
| Minimum | 8508 | 10540.03 | 8675.846 | 206648.1 | 5.75 |
| Std. Dev | 1652.367 | 1840.137 | 1946.309 | 720777.8 | 0.698807 |
| Skewness | 0.749878 | -0.376051 | -0.684937 | 0.79782 | -0.006085 |
| Observation | 69 | 69 | 69 | 69 | 69 |

Resource: Data Processing

Table 1 defines the descriptive statistics of all variables with regards to changes in ER, EXP, IMP, M2, and BRT. The table shows the following results: ER's Mean, Median, Maximum, and Minimum values are, respectively, 10390.62, 9615, 14657, and 8508. Secondly, EXP's Mean, Median, Maximum, and Minimum values are, respectively, 15018.52, 15340.48, 18530.80, and 10540.03. Thirdly, the IMP's Mean, Median, Maximum, and Minimum values are, respectively, 13338.89, 13986.65, 16749.95, and 8675.846. Fourthly, M2's Mean, Median, Maximum, and Minimum values are, respectively, 320090.8, 320790.8, 450860.3, and 206648.1. Lastly, BRT's Mean, Median, Maximum, and Minimum values, respectively, 6.684783, 6.5, 7.75, and 5.75. The results indicate that all variables show positive mean. The values of Skewness for EXP, IMP, and BRT are negative, they are, respectively, -0.376051, -0.684937, and -0.006085. While the values for ER and M2 are positive, 0.749878 and 0.79782, respectively.

2. Unit Roots Test – Augmented Dickey Fuller test.

In the econometric examination model used is VAR/VECM model, the first test performed is stationary test to build the proper econometrics model. The unit root test is conducted by observing the value

of *Akaike Information Criterion (AIC)* and *Schwarz Criterion (SC)* through Augmented-Dickey-Fuller Test (ADF-test) at level and at first difference level. If the t-statistics is value bigger than the critical value, the data is stationary at level and can be analyzed using VAR methods. But, if the t-statistics value is smaller than the critical value, then the data is not stationary at Level. ADF-test is used to examine the stationary data and lag length of the five variables in this study in level and first difference. From the data processing program using Eviews 7 program, unit root test results are shown in the table below.

Table 2. Unit Root Test - Augmented Dickey Fuller (ADF-test)

| Test | ADF | | | | | |
|------|-------------|--------|----------------|------------------|--------|-----------|
| | Level | Prob | Note | First Difference | Prob | Note |
| | t-statistic | | | t-statistic | | |
| ER | 2.178403 | 0.9999 | Not stationary | -6.851359 | 0.0000 | Stationer |
| EXP | -2.18727 | 0.2128 | Not Stationer | -12.70672 | 0.0000 | Stationer |
| IMP | -2.675923 | 0.0835 | Not Stationer | -8.834403 | 0.0000 | Stationer |
| M2 | 0.74766 | 0.9924 | Not Stationer | -10.64628 | 0.0000 | Stationer |
| BRT | -0.774254 | 0.8197 | Not Stationer | -5.971178 | 0.0000 | Stationer |

Resource: Data Processing

The results in the Table 2 above show that the values of Exchange Rate (ER), export (EXP), import (IMP), money supply (M2), and Bank Indonesia rate (BRT) are stationary in first difference. Because the five variables are in first difference ER, EXP, IMP, M2, and BRT, therefore, the variables must be transformed into first difference. The defined value in the following equation is:

$$DER_t = A_0 + A_1DEXPt_{t-2} + A_2DIMPt_{t-2} + A_3DM2t_{t-2} + A_4DBRT_{t-2} + e_t$$

In which D is at first difference, which means that DER represents the first difference of exchange rate, DEXP represents the first difference of export, DIMP represents the first difference of import, DM2 represents the first difference of money supply, and DBRT represents the first difference of Bank Indonesia rate.

3. Lag Length criteria test.

The second step for establishing the presence of a long-run relationship among the variables is to determine the optimal lag length for the VAR system. Lag-length misspecification for the VAR model often generates auto correlated errors. By determining lag

optimum, it will determine the criteria of final prediction error correction (FPE) or the total of AIC, SIC, and HQ which is minimum between some of the lags.

Table 3. Lag Length Criteria

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|--|-------------------|--------------|---------------|---------------|---------------|---------------|
| 0 | - 2179.6 76 | NA | 2.78e+ 24 | 70.473 43 | 70.644 97* | 70.540 78 |
| 1 | - 2142.6 12 | 66.954 61 | 1.89e+ 24 | 70.084 26 | 71.113 52 | 70.488 38* |
| 2 | - 2115.4 51 | 44.684 3* | 1.79e+ 24* | 70.014 55* | 71.901 53 | 70.755 43 |
| 3 | - 2094.8 20 | 30.613 54 | 2.15e+ 24 | 70.155 49 | 72.900 18 | 71.233 13 |
| 4 | - 2074.8 52 | 26.409 35 | 2.73e+ 24 | 70.317 81 | 73.920 22 | 71.732 21 |
| 5 | - 2051.5 37 | 27.075 15 | 3.31e+ 24 | 70.372 18 | 74.832 30 | 72.123 33 |
| *indicates lag order selected by criterion LR : sequential modified LR test statistic (each test at 5 percent level) FPE : Final Prediction error AIC : Akaike information criterion SC : Schwarz information criterion HQ : Hannan – Quinn information criterion | | | | | | |

Resource: Data Processing

The table shows the result of automatic lag length determination by Eviews 7. It shows that based on the value of Schwarz information criterion (SC) match in lag 0, which is 70.64497, the value of Hannan-Quinn Information (HQ) match in lag 1, which is 70.48838, LR statistics, Final Prediction error (FPE), and AIC match in lag 2, which are 44.68246, 1.79e+24, and 70.01455, respectively.

Automatic Eviews 7 lag length determines lag 2 as proper lag length in VECM estimation.

4. VAR Stability Test – Roots of Characteristic Polynomial.

After determining the lag length criteria to know the proper lag length for VAR estimation, the next step is to know the VAR stability test using Roots of Characteristic Polynomial. Roots of Characteristic Polynomial is performed to know whether the variable in VAR is stable to test in a VAR model. If the value of Roots and Modulus polynomial is less than 1 (<1) it means the variable is sufficient to be tested in a VAR model. The table below shows the result of polynomial test.

Table 4. Roots of Characteristic Polynomial

| Roots | Modulus |
|-----------------------|----------|
| -0.227858 - 0.644577i | 0.683666 |
| -0.227858 + 0.644577i | 0.683666 |
| -0.447781 - 0.437948i | 0.626344 |
| -0.447781 + 0.437948i | 0.626344 |

| | |
|---------------------------------------|----------|
| 0.560511 | 0.560511 |
| -0.271225 - 0.403905i | 0.486521 |
| -0.271225 + 0.403905i | 0.486521 |
| 0.281102 - 0.298921i | 0.410332 |
| 0.281102 + 0.298921i | 0.410332 |
| -0.258468 | 0.258468 |
| No root lies outside the unit circle. | |

Resource: Data processing

Based on table 4 above, all of the values of Roots and Modulus are less than one (<1), and based on VAR, it satisfies the stability control which mentioned that no root lies outside the unit circle. It means that the variable is sufficient to test in a VAR model.

5. Correlation Matrix – Johansen Julius Co-integration Test.

Co-integration test is conducted by examining the stationary value from each variable in this research. The variable can be integrated or not integrated, if the variable is integrated, it means that the variable has a long-term relationship and continued with VECM model, but if it is not co-integrated, the model will be tested in VAR First Difference (FDVAR). Co-integration test is examined using the *Johansen Juselius Co-integration Test*. In order to find out the number of co-integration vector, Trace statistics and Maximal Eigen value tests were used. In this study, the criteria to determine co-integration test is based on the probability, if the probability more than $\alpha > 0.05$, its means that the co-integration is rejected. The results of the Johansen's Trace and Max Eigen value test are shown in the table 4.5 below.

Table 5 Co-integration test Johansen Juselius Test

| Model | Hypothesized | Trace Statistic | Prob. | Max -Eigen Statistic | Prob. | Var. | Result |
|----------------|--------------|-----------------|------------|----------------------|------------|------|---|
| Lag length = 2 | None * | 140.8385 | 0.00 00 | 62.09591 | 0.00 00 | ER | Trace statistic showed there are 5 co-integration and Max Eigen statistic showed there are 3 co-integration vectors |
| | At most 1 * | 78.74261 | 0.00 00 | 32.44752 | 0.01 09 | EXP | |
| | At most 2 * | 46.29510 | 0.00 03 | 30.54058 | 0.00 18 | IMP | |
| | At most 3 * | 15.75452 | 0.04 57 | 9.043606 | 0.28 25 | M2 | |
| | At most 4 * | 6.710912 | 0.00 96 | 6.710912 | 0.00 96 | BRT | |

Table 5 above shows the results of Johansen Juselius Co-integration test. The MacKinnon-Haug-Mihelis p-values are $0.000 < \alpha = 0.05$, therefore, it rejects H_0 and accepts H_a , or the model is significant. Trace test statistic showed 5 co-integration and Max Eigen statistics showed 3 co-integration vectors among the variables at $\alpha = 0.05$. In other words, there is co-integration among ER, EXP, IMP, M2, and BRT for the period of January 2010 – September 2015. Based on Johansen Juselius Cointegration Test, it indicates that five co-integration test mean variables of ER, EXP, IMP, M2, and BRT have a long run co-integration, the next method is VECM test for long run and short run.

6. Pairwise Granger Causality Test.

Granger causality test is conducted to know whether of each the variables have causality relationship or not. In other words, every variable has causality to other variable and can become the exogenous variable and endogenous variable. This research uses $\alpha = 5$ percent as indicator. The result of Pairwise Granger Causality test is shown in the table 6 below

Table 6 Result Pairwise Granger Causality Test

| Dependent Variable | Independent Variable | Probability |
|--------------------|----------------------|-------------|
| ER | EXP | 0.0115* |
| | IMP | 0.1694 |
| | M2 | 0.0211* |
| | BRT | 0.0346* |
| EXP | ER | 0.3336 |
| | IMP | 0.0123* |
| | M2 | 0.9895 |
| | BRT | 0.6715 |
| IMP | EXP | 0.6989 |
| | ER | 0.1545 |
| | M2 | 0.8966 |
| | BRT | 0.0480* |
| M2 | EXP | 0.0060* |
| | IMP | 0.2536 |
| | ER | 0.0676 |
| | BRT | 0.3276 |
| BRT | EXP | 0.1670 |
| | IMP | 0.1878 |
| | M2 | 0.0411* |
| | ER | 0.5375 |
| $\alpha 5\%$ | | |

Resource: Data Processing

Table 6 shows that the result for ER as dependent variable, it has 3 significant independent variables that influence it statistically, they are, EXP, M2, and BRT which their value are 0.0115, 0.0211, and 0.0346, but with ER as independent variable for those variable as independent, there was no significant influence as the value, respectively, 0.336, 0.0676, and 0.5375. It means H_0 is rejected, it means there is

unidirectional relationship between EXP to ER, M2 to ER, and BRT to ER.

Variable EXP is statistic but not significantly influence to IMP but IMP is statistic and significantly influence to EXP which shown from the probability values respectively 0.06989 and 0.0123, it means H_0 is rejected and can be concluded that there is unidirectional relationship between IMP to EXP.

Variable IMP is statistic but not significantly influence to BRT but BRT is statistic and significantly influence to IMP which shown from the probability values respectively 0.1878 and 0.0480, it means H_0 is rejected and can be concluded that there is unidirectional relationship between BRT to IMP.

Variable M2 is statistic but not significantly influence to EXP but EXP is statistic and significantly influence M2 which shown from the probability values respectively 0.9895 and 0.0060, it means H_0 is rejected and can be concluded that there is unidirectional relationship between EXP to M2.

Variable BRT is statistic but not significantly influence to M2 but M2 is statistic and significantly influence BRT which shown from the probability values respectively 0.3276 and 0.0411, it means H_0 is rejected and can be concluded that there is unidirectional relationship between M2 and BRT.

Variable ER is statistic but not significant influence to IMP and vice versa that is shown from the probability values respectively (0.1545) and (0.1694), it means H_0 is accepted can be concluded between both variables that there is no causality relationship.

Variable IMP is statistic but not significant influence to M2 and vice versa that is shown from the probability values respectively 0.2536 and 0.8966, it means H_0 is accepted can be concluded between both variables that there is no causality relationship.

Variable EXP is statistic but not significant influence to BRT and vice versa that is shown from the probability value respectively 0.1670 and 0.6715 which means that H_0 is accepted, it can be concluded that between both variables there is no causality relationship.

7. VECM Estimation.

VECM test result will get the long run and short-run relationships between the dependent variable and independent variable. In VECM model will determine the long run and short-run between DER, DEXP, DIMP, DM2, and DBRT. This study uses lag 2, based on lag length criteria, it is determined that the result of DER is the dependent variable and DEXP, DIMP, DM2, and DBRT are set as independent variables. Table 7 below shows the long-run and short-run relationship between Exchange rate (DER) as

dependent variable and another variable as independent variable, the result is as follows:

Table 7 VECM Estimate Long-Run

| Long-Term | | |
|-----------|-------------|-------------|
| Variable | Coefficient | T-Statistic |
| EXP(-1) | -0.141717 | -0.86078 |
| IMP(-1) | 0.518045 | 3.01729** |
| M2(-1) | -0.002787 | -9.60177** |
| BRT(-1) | 117.1374 | 0.51888 |

Resource: Data Processing

Table 5.7 above is the summary from VECM analysis to see the influence of significant variable in long-run relationship. The result of long-run relationship from table 5.7 shows all independent variables which influence ER are, respectively, export (EXP), import (IMP), money supply (M2) and Bank Indonesia rate (BRT), with significant value of $\alpha > 5$ percent, respectively -0.86078, 3.01729, -9.60177 and 0.51888.

The first normalized equation in Long-Run Estimate :
 $ER = -0.141717 EXP (-1) + 0.518045 IMP (-1) - 0.002787 M2 (-1) + 177.1374 BRT (-1)$

According to the equation in VECM long run estimate, a long-run relationship among the variables is shown. Exchange rate shows positive values significantly to IMP and BRT and for EXP and M2 have negative value significantly.

Table 8 VECM Estimate Short-run

| Short-Run | | |
|----------------|-------------|-------------|
| Variable | Coefficient | T-Statistic |
| CointEq1 | -0.220947 | -3.57746*** |
| D(ER(-1)) | 0.130575 | 1.01090 |
| D(ER(-2)) | -0.077894 | -0.57305 |
| D(EXP(-1)) | -0.062939 | -2.00545** |
| D(EXP(-2)) | -0.060601 | -2.01186** |
| D(IMP(-1)) | 0.058846 | 1.76672 |
| D(IMP(-2)) | 0.088096 | 2.90443*** |
| D(M2(-1)) | 0.001031 | 1.20978 |
| D(M2(-2)) | 0.000453 | 0.58204 |
| D(BRT(-1)) | 213.2985 | 0.96015 |
| D(BRT(-2)) | 666.8306 | 2.92897*** |
| C | 12.24113 | 0.25008 |
| R-squared | 0.387970 | |
| Adj. R-squared | 0.263297 | |

***, **, *. 1%, 5%, 10%

Resource: Data processing

Table 8 above is the summary from VECM analysis to see the influence and significant variable in short-run. In short run, export, import, and Bank Indonesia rate are significant and money supply is not significant, it means that in short-run and long-run some variables have influence to ER. Export in 1st and 2nd lag is significant and negative to ER. Import in 2nd lag is significant and positive to ER. Bank Indonesia rate in 2nd lag is significant and positive to ER. Short run equation on VECM model is shown as follows:

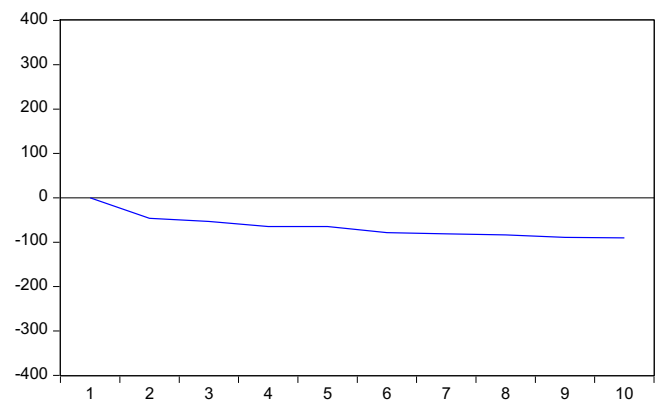
The Second normalized VECM Short-Run Estimate:
 $DER = 12.24113 + 0.130575D(ER(-1)) - 0.077894D(ER(-2)) - 0.062939D(EXP(-1)) - 0.060601D(EXP(-2)) + 0.058846D(IMP(-1)) + 0.088096D(IMP(-2)) + 0.001031D(M2(-1)) + 0.000453D(M2(-2))$

$2)) + 213.2985D(BRT(-1)) + 666.8306D(BRT(-2)) - 0.220947CointEq1$

2. Impulse Response.

The function of Impulse Response is to track the response of a variable over time after a shock to the VAR system. Sims, 1992 in his book, Ajija [7] explains the function of IRF expectation k-period ahead and the error prediction variable caused by innovations of other variables. Thus, the shock effect duration of one variable to other variable up to the point when the effect of shock disappears or returns to equilibrium can be seen and known. The persistence of a shock indicates how quickly the system returns to equilibrium. Graph below shows the result of analysis on Impulse Response, as follows:

Response of ER to EXPORT

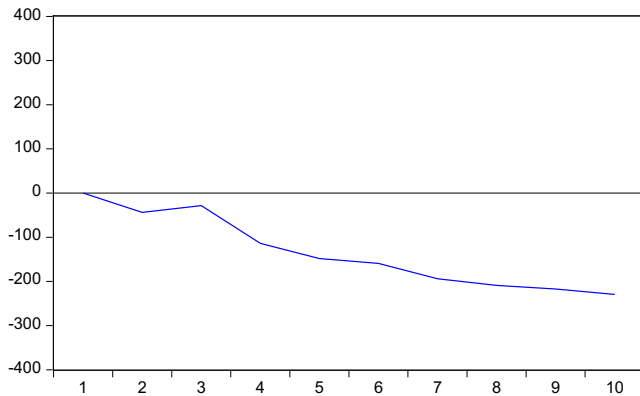


Resource: Data Processed

Figure 3 Response of ER to EXPORT

From the graph above we can see the response of exchange rate toward the changes in export. In the 1st period there was no change for exchange rate when export change, but after 2nd period till 10th period exchange rate value will decrease eventually especially between 1st and 2nd period. It means that export can strengthen the value of exchange rate as there is an inflow of foreign currency to Indonesia and increase the need of Rupiah which decrease the price of Rupiah against US Dollar. So government should help exporters and give them hand to improve the amount of exported goods which can strengthen the value of Rupiah.

Response of ER to IMPORT

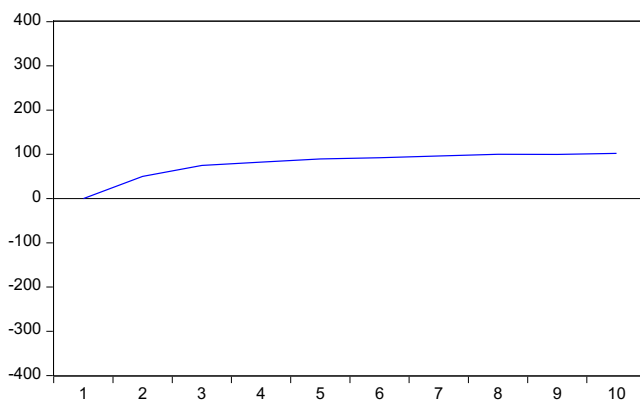


Resource: Data Processed

Figure 4 Response of ER to IMPORT

From the graph above we can see the response of exchange rate due to the change in import. Exchange rate has a negative response to the import from the 1st period exchange rate was decreasing but at 2nd period it try to increase but after 3rd period till 10th period exchange rate was decreasing significantly. It means that import causes Rupiah to decrease or with other side import was decreasing when rupiah was decreasing. So actually between Rupiah and import has some important role which response each other negatively, then government should pay their attention to both of them as our country still in need of import to survive.

Response of ER to M2

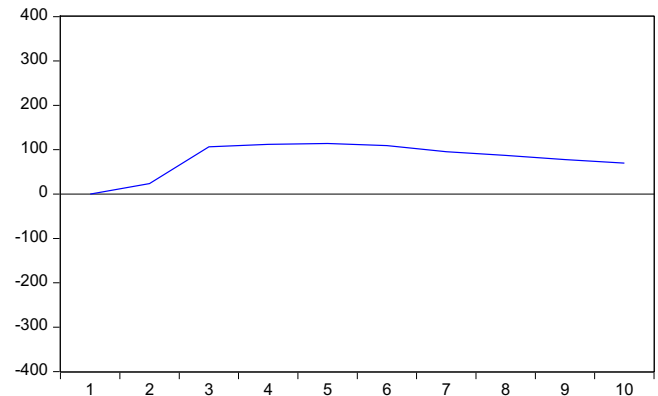


Resource: Data Processed

Figure 5 Response of ER to M2

From the graph above we can see the response of exchange rate to money supply. Exchange rate response to money supply is a positive response from the 1st period till 3rd period and it stabilize in the positive side till 10th period. It means that money supply affect positively to exchange rate. So government should intervene when money supply too high and it made exchange rate price increase to prevent the high price of Rupiah and make the price stabilize even more.

Response of ER to BIRATE



Resource: Data Processed

Figure 6 Response of ER to BIRATE

From the graph above we can see the response of exchange rate to Bank Indonesia rate. At 1st period till middle of 2nd period it increase but in stable term. After 2nd period it increase dramatically till 3rd period and then it stabilize and decreasing time to time but still in positive side till 10th period. It means that the change in Bank Indonesia rate will affect positively to exchange rate but in the meantime it will stabilize slowly to reach the equilibrium point. So government should pay their attention to their monetary policy which includes the deciding of Bank Indonesia rate. Because it will affect the real market and money market eventually.

8. Forecasting Variance Decomposition.

Variance decomposition is used to detect the causal relations among the variables. It explains the degree at which the variable is explained by the shocks in all variables in the VAR system. Variance decomposition measures the percentage of forecast error of variation that is explained by another variable in the short-run dynamics and interactions. It does not provide information on how variables of interest respond to shocks or innovations in other variables. This study explores variance decomposition based on VAR specification. Table 9 below shows the result of variance decomposition, as follows.

Table 9 The result Variance Decomposition

| Period | S.E | DER | DEXP | DIMP | DM2 | DBRT |
|--------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 | 210.23 62 | 100.00 00 | 0.0000 00 | 0.0000 00 | 0.0000 00 | 0.0000 00 |
| 2 | 309.86 08 | 92.583 61 | 2.2278 96 | 1.9844 58 | 2.6137 23 | 0.5903 18 |
| 3 | 394.78 30 | 82.259 26 | 3.1865 23 | 1.7378 54 | 5.1941 53 | 7.6222 09 |
| 4 | 478.18 67 | 71.961 27 | 4.0083 75 | 6.8575 57 | 6.4979 15 | 10.674 88 |
| 5 | 550.51 12 | 63.298 13 | 4.4058 57 | 12.420 52 | 7.5399 37 | 12.335 55 |

| | | | | | | |
|----|--------------|--------------|--------------|--------------|--------------|--------------|
| 6 | 616.61 06 | 57.069 58 | 5.1391 35 | 16.571 23 | 8.2442 85 | 12.975 76 |
| 7 | 682.22 31 | 51.463 10 | 5.6212 25 | 21.635 34 | 8.7282 71 | 12.552 07 |
| 8 | 744.26 58 | 46.890 91 | 5.9866 64 | 26.054 59 | 9.1503 52 | 11.917 48 |
| 9 | 802.81 50 | 43.301 55 | 6.3825 14 | 29.722 79 | 9.4118 16 | 11.181 33 |
| 10 | 859.33 45 | 40.212 22 | 6.6743 32 | 33.067 04 | 9.6278 43 | 10.418 56 |

Resource: Data Processing

Table 9 above shows the result of variance decomposition of DER. In the 1st period DER is 100 percent influenced by its own variable. Furthermore, the influence of DER variable itself decreases by 40.2% in the 10th month. Table above also defines that in 1st period DER variable is 0 % influenced by DEXP, but in the last 10th month DEXP influence DER to 6.7%. Another explanation for DIMP variable which affect 0% in the 1st period to DER, while in the last 10th month DIMP affect DER to 33.1%. For DM2 variable, it affects 0% in the 1st period to DER and in the last 10th month DM2 affect DER to 9.6%. Lastly for DBRT, in the first period it affects DER 0% and in the last 10th month DBRT affect DER to 10.4%.

IV. CONCLUSION

This study is started by the structural order of VAR to VECM. It started from Unit Roots Test and finished in Variance Decomposition. Based on the analysis and the test results above on the effects of export (EXP); import (IMP); money supply (M2); and Bank Indonesia rate (BRT) on exchange rate (ER), it can be concluded that:

1. In the long-run, some of the independent variables such as import and money supply have significant correlation to ER with positive and negative impact respectively while export and Bank Indonesia rate have not significant correlation to ER with negative and positive impact respectively. In the short-run, all of the independent variables have significant influence on ER except money supply, whereas import, money supply and bank Indonesia rate have a positive relationship to ER. Meanwhile, export has a negative influence to ER.
2. Based on the Impulse Responses and Forecast Error Variance Decomposition, the independent variable in which all variables are most capable to have a high shock to ER is import, because it gives a descent amount of the shock as shown on the forecast error variance decomposition and impulse responses in the previous period. It is suggested that the

government has awareness towards the stabilization of the import markets.

V. RECOMMENDATION

Regarding to the study conclusion, the researcher submits recommendations for maintaining the stability of exchange rate as follows:

1. Based on the findings, we can conclude that all of independent variables significantly control the value of exchange rate in short and long run. Government should pay their attention toward export, import, money supply, and Bank Indonesia rate with the attention to the people reactions to the changes of those independent variable which the reaction will affect exchange rate respectively.
2. As Bank Indonesia rate is one element of monetary system government should confirm in the changes of it between reaching the goal of Bank Indonesia rate and maintaining the stability of exchange rate as the research find the positive and significant effect of Bank Indonesia rate toward exchange rate.
3. Because exchange rate is influencing trade balance as well the maintaining of it is a key to increase or decrease export as well with the policy of government to control the amount of exported and imported goods to reach the welfare for all of the society in Indonesia.
4. As Bank Indonesia rate is not significant in long-run government should pay attention to the desire of people in the real market as it can drive the people to do the economic activity. So government can improve another policy as using open market operation or reserve requirement ratio to stabilize exchange rate value in the future.
5. Muhammadiyah can take the research as the basis to reform the law no.24 year 1999 which talked about the flow of reserve and the exchange rate. The measurement that can be taken is BiRate was not significant in the long-run event depends on the result findings so there should be another thing that can control the volatility of exchange rate and make a stable value of it.

REFERENCES

- [1] Ulfia dan Aliasuddin, Hubungan Pendapatan dan Kurs di Indonesia, *Jurnal Ekonomi dan Pembangunan*, 2(1), 2011, pp. 33-44
- [2] Muchlas, Zainul and Agus R., Faktor-Faktor yang Mempengaruhi Kurs Rupiah Terhadap Dollar Amerika Pasca Krisis (2000-2010), *Jurnal Jibeka*. 9 (1), 2015, pp. 76-86.
- [3] <http://www.bi.go.id>
- [4] Palasari, RR Suci., *Efek Ekspor, Impor, Tingkat Inflasi dan Tingkat Suku Bunga terhadap Nilai Tukar Rupiah*, UIN Malik Maulana Ibrahim, 2015.
- [5] Gujarati, *Basic Econometrics*, 3rd ed., New York: McGraw-Hill, 1995.
- [6] Jeong, Intra and Inter-Continental Transmission of Inflation in Africa, *Journal Applied Financial Economics*, 12, 2002, pp. 731-741.
- [7] Ajija, Shochrul R., *Cara Cerdas Menguasai EViews*. Jakarta: Salemba Empat, 2011.
- [8] Basuki, Agus dan Imamudin. *Elektronik Data Prosesing (SPSS 15 dan EVIEWS 7)*. Yogyakarta : Danisa Media, 2014.
- [9] Adebisi, Does Money Tell Us Anything About Inflation in Nigeria?, *Journal Singapore Economic Review*, 52(1), 2007, pp. 117-134.

The Changing of Community Media Dynamics in Indonesia a Case Study of *GrabagTV* as a Media Literacy for Grabag Villagers

Hanna Nurhaqiqi

Postgraduate of Communication Studies
Faculty of Social and Political Science
University of Gadjah Mada
Yogyakarta, Indonesia
E-mail: hannanurhaqiqi@yahoo.com

ABSTRACT

This study discuss about the dynamics of *GrabagTV* in maintaining its presence as a Community TV. The existence of *GrabagTV* has received the full support of the Grabag villagers. Program content which is very close to the citizens as well as consistency in raising local wisdom, making *GrabagTV* as a representatives that are always watched by citizens Grabag. Until finally in 2012, *GrabagTV* has officially stop broadcasting in terrestrial based command Balai Monitoring II KPID Jateng. On the other hand, *GrabagTV* has many experiences of various obstacles to broadcast their program. Since its birth in 2004, *GrabagTV* has been submitted three times of broadcast license (Surat Izin Siaran) to KPID Jateng but did not receive a satisfactory answer. Indeed KPID allows *GrabagTV* broadcasting, but without an official license so that the position *GrabagTV* become 'unofficial' before the law. This research method using case studies to build analytical descriptive. Description of the challenges *GrabagTV* of terrestrial broadcasting into the Internet TV. Starting from the birth chronology *GrabagTV* to the efforts undertaken in order to survive until now. This study is expected to explore strategies of *GrabagTV* to do the Media Literacy among the Grabag Villagers. In order to become a benchmark reference for other Community media, particularly for Community TV in Indonesia. This research was designed using descriptive case study method. By exploring the diffusion stages of innovation by GrabagTV in carrying out media literacy activities to grabag residents.

Keywords: GrabagTV, Community Media, Community Television, Media Literacy

I. INTRODUCTION

By 2017, Indonesia is a country with a population of 255 million people. The enormous population also indicates the great use of media in Indonesia, especially television. Many previous studies have shown that almost every family head, from the bottom to the top, has a television. Television in the living room that comes as entertainment as well as transmitter of information from the news media to the audience. Televisi becomes so dominant among other mainstream media. Although at this time some recent time emerging new technology, smartphone gadgets that began to attract a lot of people.

Speaking of television in Indonesia, we are talking about a big and dominant business. Famous for its media oligopoly, Indonesia has a broadcast media system that is owned by only a few large owners. Private television becomes very dominant and more favored by the public than the public television. This impacts on the dominance of private television broadcasts that serve more ads, soap operas, and broadcast national information. While on the other hand, the Indonesian people who are archipelago areas, have information needs that differ from region to region.

The need for an alternative medium that can provide information with local proximity and can provide entertainment in accordance with local cultural

customs. Then there is Community Television, as a community media that can accommodate the needs of local communities. In accordance with Law 32/2002 on Broadcasting, Article 13 paragraph 2, reads:

“Broadcasting services as referred to in paragraph (1) shall be organized by:

- A. Public Broadcasting Institution;
- B. Private Broadcasting Institutions;
- C. Community Broadcasting Institutions; and
- D. Subscription Broadcasting Institution.”

Community TV is acknowledged by the state, though still not developed and sought after by the people of Indonesia. GrabagTV stands among the citizens of Grabag as a form of success in the action of media literasi. GrabagTV development through a long process, starting from 2004 until now. Therefore, this research will descriptively explain how Grabag citizens receive GrabagTV. Through Innovation Diffusion theory to deeply analyze the process of media literacy by GrabagTV Community TV. How Grabags can receive Community TVs that are present in the midst of the heavily TV National Private which is present as mainstream media.

II. COMMUNITY MEDIA AS LITERACY MEDIA

The station is in the middle of the Grabag countryside, broadcasting programs close to its citizens. Such as local news, village entertainment, or

counseling for local farming. This Community TV is located in Ponggol Hamlet, Grabag Subdistrict, Magelang Regency, Central Java. The location of GrabagTV is quite unique because its area is like a basin that forms a valley and is in the highlands. So there is not much signal from the television station that gets to this area. The Grabag region is called blankspot, because it is in an area that can not be reached by any television signal. Around 1995, the Grabag District Office established a simple transmitter. Only then did the citizens of Grabag begin to enjoy the broadcast of television, even though only one television channel.

Based on these conditions GrabagTV present as a television that presents the locality of information as well as doing media literacy. Present the locality of the information in question is the program impressions by lifting information that is in the Grabag region. Then GrabagTV provides media literacy through the involvement of Grabag residents in producing their own programs. At the same time citizens participate in watching, producing, as well as evaluating the programs that they produce themselves. The production produced by Grabag residents with GrabagTV is then broadcast through the transmitter at the Grabag District Office. The airtime that airs alternately with TVRI or RCTI, by taking a four-hour relay time per GrabagTV. The programs are very close to the people of Grabag, such as the activities undertaken at the sub-district level or the people's entertainment held by each hamlet in the Grabag region.

TABLE I. PROGRAM BROADCAST OF GRABAGTV

| Program of Community Television | |
|--|---|
| Program Type | Time |
| Main Program | Every Monday, Wednesday, and Friday 15.00 to 18.00 VHF5 and VHF7 |
| • Sinetron Program | |
| • News Program | |
| • Talkshow | |
| Featured Program | |
| • Grabag Olah Vocal (Singing Competition) | |
| • Genuk-genuk Roso (Reality Show) | |
| • Campursari (Local Entertainment) | |
| • Head of Grabag Village Election | |
| • Counseling of Agricultural by Local Government | |
| • Islamic Local Lecture | |

Source: GrabagTV Archive

A. History of GrabagTV

GrabagTV is a community-based Community Television that utilizes blankspot as an opportunity to broadcast. Although it has been established since 2004 until now, has not also get a license broadcasting official. But the existence of Television Community is still exist, as evidenced from the still active activities of production and broadcast via Internet Television.

GrabagTV's membership structure consists of Grabag citizens with various professions. Even voluntary and not given any wages. GrabagTV founders are active in educating people who are members of the structure in order to professionally broadcast production. Although only with simple equipment, GrabagTV can broadcast well. This organizational structure is retrieved the latest data from the GrabagTV Profile in 2014.

Citizen-based communities make GrabagTV its own uniqueness. As in the Documentary Film "Small World In The Box" about the life of Grabag people attached to GrabagTV. Television The community has successfully introduced broadcast media to rural areas. Community management and programming by citizens of Grabag make clear evidence that television belongs to anyone. Moreover, as a democracy, the public should be aware of the rights and obligations in fulfilling public information. GrabagTV has carried out this awareness process to the Grabag citizens and is slowly able to change the citizen's point of view on the importance of information media that elevates locality and local culture.

B. The Dynamic of Licensing

GrabagTV is a community-based Community Television that utilizes blankspot as an opportunity to broadcast. Although it has been established since 2004 until now, not to mention the official broadcast permit. This television still exists, proved to be still active production and broadcasting activities via Internet Television.

GrabagTV's membership structure consists of Grabag citizens with various professions. It is nothing. GrabagTV founders are active in educating people who are members of the structure to be professionally broadcast production. Although only with simple equipment, GrabagTV can broadcast well. This organizational structure is retrieved the latest data from the GrabagTV Profile in 2014.

Citizen-based communities make GrabagTV its own uniqueness. As in the Documentary Film "Small World In The Box" about the life of Grabag people attached to GrabagTV. Television The community has successfully introduced broadcast media to rural areas. Community management and programming by citizens of Grabag make concrete proof of the television of

anyone. Look forward to being a democracy as it is the public right for the right and responsibility to fulfill public information. GrabagTV has experienced this awareness process to the Grabag citizens and is gradually able to change the citizen's point of view on the importance of media information that elevates locality and local culture.

C. Internet Television Transition

The transmitter used by GrabagTV used the VHF5 channel and in 2009 it changed to VHF7. GrabagTV took turns broadcasting analogues with national private television channels. Based on Law No.32 of 2002 which recognizes the existence of Community Broadcasting Institution, both Television and Radio. GrabagTV continues to advocate in obtaining fixed frequency allocations. Technical provisions that have been regulated in more detail in Government Regulation No.51 of 2005 actually complicate the existence of Grabag TV Television Community.

As in Article 5, paragraph 1, "The LPK broadcast radius is limited to a maximum of 2.5 kilometers from the transmitter site or with a maximum effective radiation power of ERP (fifty watts)." The regulation only limits broadcast coverage without considering the different geographic and population conditions in different parts of Indonesia. The area of Grabag District is more than 2.5 kilometers and the distance between houses is not too close. This requirement is deemed less relevant for Community TVs in rural areas such as GrabagTV. In contrast to urban areas where the distance between houses coincide and more dense. Even so GrabagTV keeps broadcasting regularly through fifty-watt assembled transmitters that reach only a seven kilometer radius.

Advocacy efforts in submitting licenses have been made by GrabagTV to KPID Central Java. But it never worked and never got enlightenment in forming a dynamic space for GrabagTV. In the midst of GrabagTV's struggle to get analog broadcasting permission, many Grabags now use Television Subscription. Television subscriptions have offered more television broadcasts when compared to VHF antennas so GrabagTV is losing its audience.

When GrabagTV and other Community TVs are experiencing the complexity of analog broadcasting licensing in the Central Java KPID. At the same time, Kominfo also discusses the Implementation of Terrestrial Digital Television Broadcasting of Free Paid (Free to Air). Then passed by the MoCI through Permenkominfo RI No.32 of 2013 on Organizing Digital Television Broadcasting and Multiplexing Broadcasting through Terrestrial System. The existing analog broadcasts will be diverted to digital so as to

enable multiplexing systems. Through a multiplexing system, an analog frequency channel can be used from six to twelve digital frequency channels.

GrabagTV as a Community TV looking of the condition of this digital broadcasting switch as an opportunity. This Community TV realizes that it is in a low bargaining position in the presence of KPID in obtaining analogue frequency. If GrabagTV continues to force it to get terrestrial broadcasting permission then it will only waste time. This digital broadcasting transition is used by GrabagTV to no longer utilize analog broadcasting. However try to use an alternative medium that can approach digital broadcasting. By transforming into Internet TV with the site www.grabagtv.com.

IV. DISCUSSION

The content of the more ndeso and local GrabagTV programs is favored by Grabag residents as compared to RCTI or TVRI broadcasts. More understandable language and Grabag news which is more needed by the citizens. Compared to political discussions, corruption news in the Jakarta area, or Jakarta-style sinetro more broadcast by National Private TV outside Grabag there. As in 2007, this Community TV broadcast live Pilkades process or Village Head Election in Grabag. From the beginning to the end GrabagTV aired this five-year-old election event. This broadcasting is a very worthy information to be heard, whether by the citizens of Grabag as the owner of the votes and high officials of the Village Government.

In broadcasting broadcast Pilkades also actively involve some Grabag citizens who have skills in the field of broadcasting. It affects the openness of the government to be covered by its own citizens thereby increasing the sense of responsibility for the ranks of Village Government Grabag. Through the phenomenon becomes one of the foundations of GrabagTV community TV in providing color as a broadcasting solution in the country. GrabagTV's own response is excellent among Grabag people.

V. CONCLUSION

GrabagTV as Television Community-based communities have a role in running media literacy as well as fulfilling local information needs for Grabag citizens. The need for information and media literacy is very impossible to find in mainstream television based in Jakarta. The procurement of Community TV has become a relevant innovation and is accepted by local residents. The diffusion or form of spreading done by GrabagTV is quite effective. By actively engaging citizens as well as being a disseminator of information to other citizens. Especially with rural areas, the

distribution of word of mouth is much more effective than the leaflets, advertising on billboards, or other forms of 'urban promotion'. Overall using this diffusion innovation strategy is successful because it is able to change the social system of Grabag people. From the original not yet understood about the media, even now not infrequently citizens are involved in the production as well as implementing citizen-based media literacy.

ACKNOWLEDGMENT

This research is dedicated to the faculty of social sciences and political science, University of Gadjah Mada, Yogyakarta.

REFERENCES

- [1] Adiputra, Wisnu Martha. 2006. Menyoal Komunikasi Memberdayakan Masyarakat. Yogyakarta: Penerbit Fisipol UGM.
- [2] Alfian. 1986. Transformasi Sosial Budaya dalam Pembangunan. Jakarta: UI-Press.
- [3] Armando, Ade. 2011. Televisi Jakarta di atas Indonesia. Yogyakarta: Penerbit Bentang, Anggota Ikapi.
- [4] Burhan, Bungin. 2008. Penelitian Kualitatif. Jakarta: Prenada putra Grafika.
- [5] Darmanto, dkk. 2012. Ibu Rumah Tangga Melawan Televisi. Yogyakarta: Matamedia Press.
- [6] Dominick, Joseph R; dkk. Broadcasting, cable, the internet, and beyond. USA : Mc Graw Hill Publications.
- [7] Griffin, E.M. 2013. A First Look at Communication Theory. America: McGraw Hill.
- [8] Ibrahim, Idi Subandy dan Bachruddin Ali Akhmad. 2014. Komunikasi dan Komodifikasi: Mengkaji Media dan Budaya dalam Dinamika Globalisasi. Jakarta: Yayasan Obor Indonesia.
- [9] Ife, Jim dan Frank Tesoriero. 2014. Community Development: Alternatif Pengembangan Masyarakat di Era Globalisasi. Yogyakarta: Pustaka Belajar.
- [10] Komisi Penyiaran Indonesia Pusat. 2013. Kedaultan Frekuensi: Regulasi Penyiaran, Peran KPI, dan Konvergensi Media. Jakarta: PT Kompas Gramedia Nusantara.
- [11] Kovach, Bill dan Tom Rosenstiel. 2012. Blur: Bagaimana Mengetahui Kebenaran di Era Banjir Informasi. Jakarta Pusat: Dewan Pers.
- [12] Lull, James. 1998. Media, Komunikasi, Kebudayaan : Suatu Pendekatan Global. Jakarta : Yayasan Obor Indonesia, Anggota IKAPI.
- [13] Manan, Abdul dkk. 2005. Media Sadar Publik : Media Lokal Mewartakan Korupsi dan Pelayanan Publik. Jakarta: Penerbit LSPP.
- [14] Manyozo, Linje. 2012. Media, Communication and Development. India: SAGE Publications India Pvt Ltd.
- [15] Maryani, Edi. 2011. Media dan Perubahan Sosial : Suara Perlawanan Melalui Radio Komunitas. Bandung : PT Remaja Rosdakarya.
- [16] Miller, Daniel dan Don Slater. 2000. The Internet: An Ethnographic Approach. London: Oxford Intl Publishers Ltd.
- [17] Miller, Daniel. 2003. The Internet: An Ethnographic Approach. UK: Berg
- [18] Mufid, Muhammad. 2005. Komunikasi dan Regulasi Penyiaran. Jakarta: Kencana.
- [19] Nazaruddin dkk. 2009. Televisi Komunitas: Pemberdayaan dan Media Literasi. Yogyakarta: Combine Research Institute, dkk.
- [20] Nugroho, Y., Putri, DA., Laksmi, S. 2012. Memetakan Lansekap Industri Media Kontemporer di Indonesia (Edisi Bahasa Indonesia). Laporan. Bermedia, Memberdayakan Masyarakat: Memahami kebijakan dan tatakelola media di Indonesia melalui kacamata hak warga negara. Riset kerjasama antara Centre for Innovation Policy and Governance dan HIVOS Kantor Regional Asia Tenggara, didanai oleh Ford Foundation. Jakarta: CIPG dan HIVOS.
- [21] Nugroho, Y., Siregar, MF., Laksmi, S. 2012. Memetakan Kebijakan Media di Indonesia (Edisi Bahasa Indonesia). Laporan. Bermedia, Memberdayakan Masyarakat: Memahami kebijakan dan tatakelola media di Indonesia melalui kacamata hak warga negara. Kerjasama riset antara Centre for Innovation Policy and Governance dan HIVOS Kantor Regional Asia Tenggara, didanai oleh Ford Foundation. Jakarta: CIPG dan HIVOS.
- [22] Oepen, Manfred. 1988. Media Rakyat : Komunikasi Pengembangan Masyarakat. Jakarta : Perhimpunan Pengembangan Pesantren Masyarakat (P3M).
- [23] Putri, A. (2013, 24 Maret). 19 Penyelenggara Penyiaran Ikut Seleksi TV Digital. Tempo. Diambil dari <http://www.tempo.co/read/news/2013/03/24/090468977/19-Penyelenggara-Penyiaran-Ikut-Seleksi-TV-Digital>
- [24] Rahayu, dkk. 2014. Kinerja Regulator Penyiaran Indonesia: Penilaian atas Derajat Demokrasi, Profesionalitas, dan Tata Kelola. Yogyakarta: Pemantau Regulasi dan Regulator Media (PR2Media).
- [25] Rahz, Muhammad Hidayat dkk. 1999. Menuju Masyarakat Terbuka: Lacak Jejak Pembaruan

Sosial di Indonesia. Yogyakarta: Ashoka Indonesia.

- [26] Rogers, Everett M and F. Floyd Shoemaker. 1971. *Communication of Innovation: a Cross-Cultural Approach*. New York: The Free Press.
- [27] Rogers, Everett M. 1973. *Communication Strategies for Family Planning*. New York: The Free Press.
- [28] Rogers, Everett M. *Komunikasi dan Pembangunan : Perspektif Kritis*. LP3ESKristiawan, R. 2013. *Model-model Gerakan Literasi Media dan Pemantauan Media di Indonesia*. Yogyakarta : Pusat Kajian Media dan Budaya Populer (PKMBP).
- [29] Rohim, Syaiful. 2009. *Teori Komunikasi: Perspektif, Ragam dan Aplikasi*. Jakarta: Rineka Cipta.
- [30] Salim, Agus. 2002. *Perubahan Sosial: Sketsa dan Teori dan Refleksi Metodologi Kasus Indonesia*. Yogyakarta: PT Tiara Wacana Yogya.
- [31] Santori, Djam'an dan Aan Komariah. 2011. *Metodologi Penelitian Kualitatif*. Bandung: Alfabeta.
- [32] Severin, Werner J. dan James W. Tankard, Jr. 2005. *Teori Komunikasi: Sejarah, Metode, dan Terapan di dalam Media Massa*, edisi kelima. Jakarta: Prenada Media.
- [33] Shriky, Clay. 2008. *Here Comes Everybody: The Power of Organizing without Organization*. USA: Penguin Books.
- [34] Sulistyowati, dkk. 2005. *Komunikasi Pemberdayaan*. Yogyakarta: APMD Press.
- [35] Tim LSPP (Lembaga Studi Pers dan Pembangunan). 2005. *Media Sadar Publik : Media Lokal Mewartakan Korupsi dan Pelayanan Publik*. Jakarta : LSPP.
- [36] Usodo, Bowo dkk. 2008. *Radio Komunitas Indonesia: dari gagasan dan potret lapangan*. Jakarta: JRKI.
- [37] Venus, Antar. 2004. *Manajemen Kampanye: Panduan Teoritis dan Praktis dalam Mengefektifkan Kampanye Komunikasi*. Bandung: Simbiosis Rekatama Media.
- [38] Webster, James G; Patricia F.Phalen; and Lawrence W.Lichty. 2006. *Rating Analysis : The Teory and Ptactice of Audience Research*
- [39] Wibowo, Wahyu. 2013. *Kedaulatan Frekuensi: Regulasi Penyiaran, Peran KPI, dan Konvergensi Media*. Jakarta: PT Kompas Media Nusantara.
- [40] Yin, Robert K. 2012. *Case Study Research : Design and Methods*. California: Sage Publication, Inc.

Students' Perception on the Use of Twitter to Learn English: a Preliminary Study

¹Ianatul Khoiriyah, ²Nailis Sa'adah Safitri

English Education Department, Universitas Islam Indonesia, Yogyakarta, Indonesia
E-mail: Ianna6612@gmail.com

ABSTRACT

The advanced and continual technology development leads social media like Twitter as a daily life style. The implementation of it into language learning is a trend nowadays. This study attempts to examine students' perception toward the use of Twitter to learn English. This research was conducted using qualitative method. The data were obtained through in-depth interview with students of English Education Department of Universitas Islam Indonesia, who are active users of Twitter. The findings showed that students have positive perception and attitude toward the use of Twitter to learn English. It also revealed that students believe that Twitter is an online platform which is helpful for English learning especially for vocabulary building, grammar, writing and reading skill. In addition, Twitter helps students increasing their confidence in using English in their daily life.

Keywords: social media, Twitter, English learning

I. INTRODUCTION

As an EFL (English as Foreign Language) country, students in Indonesia have learnt English for at least 6 years due to English was one of mandatory subjects in their previous higher school. Students have studied English skills like listening, speaking, reading and writing. Unfortunately, this situation does not guarantee that all students are having good skill of English afterwards. There is a gap between speaking ability and English competence of Indonesian students due to some factors such as imbalance between teaching and practicing, also the use of conventional method as teachers' teaching style in the classroom for the majority of time [1]. English teachers in Indonesia may be hesitant to provide more various teaching style in the classroom as they were not aware of it.

Another problem of Indonesian English learners is that their writing competence in English was not excellent. When students are assigned to do some writing task like making a short descriptive paragraph, they tend to make mistakes easily in term of word spelling, grammar or sentence errors. The Indonesian English learners are having weakness in their writing skill [2].

Students also found difficulties on getting practice of their English in the classroom due to time limitation. The learning process was only about two hours to left once or two meetings weekly. Possibly, the limited allocated time for English learning becomes another challenges for both teacher and students. Some teachers may understand about it and have already used some strategies to overcome that situation. However, do all teachers in Indonesia aware about it and provide those kind of appropriate strategies?. The answer may states no due to most Indonesian English

teachers are in their age to retire. It is stated that old-English teachers tend to be bold, reluctant and strict to use lecturing method only instead of using fun way to learn English in the classroom.

Moreover, most of students especially in Universitas Islam Indonesia admitted that they have major problem in English in which relates to vocabulary. This information gained through a random unstructured interview to students in universitas Islam Indonesia. Surprisingly, the students who said it are majoring in English study program. English students supposed to be more familiar and understand numerous vocabularies ideally in order to perform better understanding in English skills. The real situation states it contrastly. Although students had already learnt English for couples of years and continue to learn English in the university, it seem that it does not guarantee their competence of English is in advanced level. It can be concluded that the majority of students have low level of English vocabulary.

Those problems above indicate that English learning process in Indonesian classroom were not running effectively for aiming competence as native-like users of English. In solving several problems stated before, as Indonesian learners of English in this 21st century era where technology such as gadget, laptop and internet connection become an obligatory thing in everyday life and social media is life-style, that can be a solution to implement social media like Twitter into language learning of English. It is stated that learning through online media like social media provides a real world learning experience for students. Some studies have proved that technology can help language learning in better way. Technology could make students to be more active in their learning [3].

Twitter as one of social media and part of product in technological development seems quite relevant to approach those problems in English learning because in accordance of familiarity and authenticity with students. It is claimed that there are around 70.0 million users of active social media users for total in Indonesia [4]. Students are a part of them. The use of Twitter in English language learning in Indonesia as an exposure beyond classroom wall is still in early stage and limited. There is no research focusing on it yet. Therefore it encourage the writers to conduct this study to give more insight about this topic.

Twitter as social media provides quick or real-time information and user-friendly platform for its users. This research focused on students' perception on the use of Twitter to learn English. In this study, Twitter plays a role as a tool to help Indonesian learner of English to do studying outside the classroom and as a form of strategy implemented by students. Thus, the authors are aiming to answers two research questions: 1) how Twitter is used to learn English by English Education students at Universitas Islam Indonesia? and 2) What is students perception on the use of Twitter to learn English?

The authors hope to provide some knowledge and information to some parties like English teachers or lectures, other researchers, and English department through this study. It may be useful for English teachers or lectures to know that their students will be learn better when they implementing technology in language learning. Other researchers may also gain benefit from this research to conduct similar further study with different participant and context. Also, the English department may consider their English curriculum to make it be more technology-based after read the result of this research.

II. LITERATURE REVIEW

The authors are going to explain about the related literature, studies and the theoretical framework of this research in this chapter.

a. Twitter as Web 2.0 technologies

There are many kinds of Web 2.0 technologies or social networking that are happening in recent times. Web 2.0 is a tool that allows people to gain or access information in second over the internet based on friendships [5]. Then, Twitter has definition as a Multiplatform Web 2.0, part of social networking and microblogging tool, freely accessibly on the Web [6].

Twitter is a microblogging system that limits its users to post no more than 140 characters, which translate into one or at most three sentences [7]. Twitter is also the youngest microblogging which is established around eleven years ago and considered as the most used

microblogging nowadays [8]. In similar, Twitter also defines as a microblogging service to communicate with others by describing the current condition of the user through twitter posting called tweet [9]. Twitter is very popular [10]. As a consequence of its popularity and features, this social media platform has recently been incorporated in some learning environments to promote a fast exchange of ideas, brainstorming, or reflective thinking [11]. In this research the writers use the definition of Twitter as one of the latest social networking that has been widely-adopted and used for additional resource to support language learning and teaching.

Twitter was created in March 2006 by Jack Dorsey, Evan William, Biz Stone and Noah Glass. The user of Twitter known as 'twitterers' and each post on Twitter called 'Tweet'. Twitter enables its user to tweet in short but in real-time. The twitterers share and get information from other users based on what have they followed.

b. English learning in Indonesia

English is a second language for the majority people in Indonesia. It means that English is learned by Indonesian students. As a consequence of English as A foreign language (EFL) English is only used in learning process. For students, they learn English in the school from secondary level and up due to English become one of compulsory subject. Although the length of English study for students in range from three to six years, the real situation is not all of them have a good English competencies. Indonesian students can understand the written form of English well. In contrast, they tend to be hesitant when it comes to English speaking for communication in real-world situation. This is as a result of imbalance teaching English component and skills in which speaking used to left behind [12].

There some reasons that make Indonesian students having low of English competencies especially in the speaking and listening skill. First, English was learned by students in traditional way in which the English teacher stands in front of the class for the whole time and give explanation to students. This way of teaching called lecturing style. It is also called as teacher-centered teaching. Teacher is the main and only source of information for students when learning in the classroom. The students' participation considered as less and limited. This kind of teaching style is the dominant mode in Indonesia for some years [13].

Second, sometimes the instructional language in the English classroom was mainly in Bahasa Indonesia or bilingual. There are not many teachers who used full English in the classroom as their language of teaching. Not

only English teachers in the school but also Indonesian English lectures perhaps more prefer to use Bahasa Indonesia instead of English. The English is used less than Indonesian in the classroom for possibly [14]. Therefore, the input for students in English was not maximal.

A. English learning in Indonesia

The implementation of Twitter in language learning of English seems provide potential uses. Twitter offers a platform for quick communication that could play a role as a catalyst for language learning by means of improving target language communicative ability [15]. It is claimed that Twitter has numerous benefits in educational use such as Twitter is able to be used as instructional tool in higher education [16]. It offers asynchronous interaction and learning for the users and followers [17]. Moreover, Twitter as a social networking allows high engagement, participatory. As in English language learning, Twitter could be used in the classroom or beyond. The role of Twitter may be various from a tool of input and practice of production while learning English language. There are four main advantage of using Twitter in the EFL classroom such as 1) communicating class content, 2) sending out small, timely piece of information, 3) encouraging collaboration and feedback and 4) encouraging concise writing [18].

Some studies have proved that Twitter seems having usefulness in language teaching and learning. A study conducted by Mervat which examined the effect of Twitter on EFL learning has shown positive result [19]. The study investigated 60 female students in the Qassim University with using experimental methods. The finding showed that Twitter influenced students' writing skill and some aspects of writing like ideas and content, organization, voice and style improved due to Twitter use as additional tool in learning.

A similar study done by Adam acar and Nanako kimura investigated the use of Twitter as a tool for English language learning of Japanese students [20]. The research used a quantitative method which analyzing and categorizing tweets from 70 students user of Twitter in Japan by using hashtag '#twinglish'. The result of this research found that tweets about greeting is the most frequent tweet that students post due to it is simple and a trigger of communication. In addition, this study also identify that students' motivation in learning English through Twitter is considerably as good.

III. METHOD

This section will explain about 1) scope of the study which includes participants, context and variables and 2) data collection and analysis.

A. Scope of the study

1. Participants

In the research, the participants are three students of English Education Department at Universitas Islam Indonesia who are in their third year of study in the university. The writers implement purposeful sampling on selecting the participants for this study. The purposeful sampling defines as the researcher selects a site or participant with intention for gaining understanding about the topic that has been studied [21]. The selection of participants for this study is based on some considerations. The first, all the participants are having account in Twitter and using it actively for learning English. This study investigates Students perception on the use of Twitter to learn English and the participants supposed to be the Twitter users for sure. There was also a consideration about the length of using Twitter for students who participate in this study. Second, the whole participants have good understanding of English in the classroom and recommended by their English lecturer. The three students who participate in this study have GPA more than 3.25 of 4.00. The third reason related to accessibility, time and permission. The whole participants are easy to access, to gain permission and to set the time for interview due to they are at the same department with the researchers.

2. Context

The research is conducted in English Education Department of Universitas Islam Indonesia in Yogyakarta, Indonesia. This department offers ICT-based curriculum in their English learning process. There are three English students as the participants of this study. The age of students is in range of 19-20 years old. All of them are in their sixth semester this year. The participants are female English students who use twitter actively but having different length of time in using Twitter. The data are gained from in-depth interviews individually for each of them and through document analysis about their tweets.

3. Variables

This study constructs three main variables which are 1) student perception, 2) learning English become the dependent variables and 3) the use of Twitter as the independent variable.

B. Data Collection and analysis

This study proposed a qualitative study. The writers use two kinds of data collection techniques of qualitative study which are in-depth interview and document analysis. A qualitative study collection is

gathering data in form of word (text) or image (picture) with general from at least one individual [22]. The samples of this research are students of English Education Department of Universitas Islam Indonesia.

The main data of this research was achieved through in depth interview with the participants. The researchers used semi-structured interview. Semi-structured interview is less flexible than the writer predetermined the question and direct the interview more closely also enable to extend the questions during the interview [23]. The writers also used documents analysis to support the main data which are participants' tweets and their score in Listening and Speaking for daily communication subject.

The researchers conduct three interviews with each participant in different time and location for aiming to reveal their perception on the use of Twitter to learn English in depth. All the interviews were delivered in Bahasa Indonesia. This is because the participant felt more comfortable in Bahasa Indonesia than speaking in English because they could more expressed their feelings. The questions asked during the interview are the adaptation version of interview questions from a study conducted by Ilker Yakin and Hasan Tinmaz [24]. However, the writers do some adaptations in order to make it more relevant with the context and participant of this study. The interview question consists of thirteen questions which reflect the variables of this research.

Thus, the gathered information and data are analyzed using qualitative approach. In the process of analysis, it includes collecting the data, coding the data, comparing the data, making interpretation and writing a report of findings. The authors do all process above simultaneously in the purpose of providing informative and reliable research findings.

IV. FINDING AND DISCUSSION

The result of this study provided some knowledge and insight regarding the use of Twitter to learn English. The findings of this research explained into three themes for discussion. They are 1) Knowledge and use of Twitter, 2) perception on Twitter as English learning tool and 3) strategies on using Twitter to learn English. The explanation of each theme is below.

A. Knowledge and use of Twitter

In term of knowledge about Twitter, each participant of this study is having good understanding about Twitter due to they already known Twitter since in high school. They are active users of Twitter for some years back and still using it until right now. Regarding the features and how to

use Twitter, all students are already familiar with it well. Two participants said that they knew Twitter from internet by their own and one student was introduced to twitter by her friend. The participants access twitter by using Twitter application that has been installed on their mobile phone with English as the language that they used in Twitter.

The purpose of participants in using Twitter focused on two major themes, communication and getting/sharing information. The participants of this study explained that they search and read news in Twitter to keep them update on information related to their interests. One student told that she interested to read about trending topic news in national or international for example news about the previous president election in the United States.

From the document analysis, the students' activities in Twitter mostly are read tweets or article, make tweets and give comments on other tweets. All students particularly make tweets about their interests, daily activities, or expressing their feelings.

Generally, the participants like Twitter much. However, in specific, they still have some aspects of Twitter that they like and dislike as well. Regarding to aspects of twitter that they like, the students identified several positive aspects of Twitter. Students 1 indicates the aspects of twitter that she like as in term regarding the contents or information in Twitter which is always fresh and new. Twitter is more simple, user-friendly and eye-catching in the design and display. While the students 2 said that 'write a tweet' feature is what she like the most on Twitter as she love to express her opinion in form of writing. By simply answering the question 'What's happening?' in Twitter could make her happy because she wants to tweet as much as possible she can. It is her main reason as she decided to use Twitter. Furthermore, student 3 focused more on the feature 'retweet'. She described that retweet is simple and can indicate which tweet is important or not depending on the number of people who retweet that tweet. She also mentioned that she love the timeline of Twitter.

As for aspect that they dislike in Twitter, student 1 does not like some advertisements that appear in her timeline in Twitter. In similar, student 2 also does not like the feature of 'friend recommendation' and advertisement in Twitter. While for the student 3, she tends to have no feature that she dislike in Twitter.

The length of students' use in Twitter varied from three years as the minimum to five years. This information is shown in table 1. Furthermore, the frequent of access in Twitter was various. The two students stated that they access Twitter more often at their leisure times like before bed-time or weekend while one student open twitter 2-6

times in a day. The students spend at least one hour in Twitter daily.

TABLE 1. THE LENGTH OF TWITTER USAGE

| No | Participants | Sex | Duration of using |
|----|--------------|--------|-------------------|
| 1 | Student 1 | Female | 3 years |
| 2 | Student 2 | Female | 5 years |
| 3 | Student 3 | Female | 4 years |

B. Perception on Twitter as English learning tool

In this research, students' perceptions about Twitter as English learning tool were mostly positives. All the participants feel that Twitter is a good and helpful tool for learning English. They love to use twitter to learn English because it was fun and exciting way of learning yet simple enough.

Besides, the students also give support to the use of Twitter in order to learn English. One student stated that Twitter is good for learning English independently outside the school. It offers direct practice for the target language within the real world situation with friends or even English native speakers. So, she can get experience to communicate with foreigner friends. This is an example for students to use social media in wise and helpful way for learning as well as interacting with friends.

Also, the other student emphasized that it is interesting to use Twitter in English language learning. She added that Twitter is really helpful as the input of target language. The students 3 also had similar statement about the use of twitter to learn English. She explained that it is extremely good idea to implement Twitter in English learning. Twitter could be used as one of exposure especially for increasing reading and writing competencies. She gave rate of Twitter quality to learn English in 8 point of 10.

Basically, they feel at easy and happy when to use twitter to learn English.

C. Strategies on using Twitter to learn English

There are several strategies used by the students founded in this research. Each of participants had their own different way of using Twitter to learn English.

The students 1 focused more on using Twitter as a tool for practicing writing skill and enhancing vocabulary. For vocabulary acquisition, she used to read other tweets and article in her timeline. When she finds a new word that she unfamiliar with, then, she open the dictionary to check the meaning of that word. She also tried to pronounce the word several times until she understands well. In order to

be more familiar with the word, she makes tweet as practice using that word as the last effort of learning. She noticed that type of vocabulary in Twitter is the majority related to daily activities. In addition, she also learned about grammar when doing some tweets. Besides, she cited by posting tweets in English frequently, she gained more confidence to use English in her daily life.

Similarly, the student 2 used Twitter for developing vocabulary and writing skill comprehension. The strategy that she used is she followed only twitter users who considerate as native-like speaker of English in which the English skill is really good based on her observation and opinion. Next, she learned from those tweets about the grammar and vocabularies. She delivered that the vocabulary is not only about daily vocabulary but also academic vocabulary but in less number. She noticed that in Twitter she can do peer-learning and peer-review with their friends. As example, when she makes some grammatical errors in her tweets, sometimes her friend will correct it and give the right form or sentence. This student defined Twitter as free-writing platform.

As for the student 3, there is no much difference regarding the skill that she emphasized to be better through Twitter. It is vocabulary and reading skill. She revealed that from Twitter she know how to be critic and selective when reading articles.

Particularly, the students do not find impactful problems when using twitter to learn English. They realized that students should know how to filter some inappropriate words that may appear in their timeline. To do so, students are suggested to follow some educational twitterers only and be aware about slang or negative English words.

In the end of interview session, the interviewees admitted that their English developed significantly after using Twitter. Also, they wanted to keep using Twitter to learn English for the upcoming days due to Twitter is an easy tool for getting entertainment and learning English and the features are simple, interesting and real-time information.

V. CONCLUSION

The purposes of this research were to reveal students' perception on the use of Twitter to learn English and to investigate how students used twitter to learn English. It has been confirmed by this study that students have positive perception and attitude toward the use of Twitter to learn English. It is believed that Twitter can be used as a tool for English learning.

Furthermore, students used Twitter only at their leisure time or outside the classroom. The findings of this research found that Twitter is helpful to increase vocabulary, learn grammar and writing, reading and confidence to use English.

REFERENCES

- [1] Astuti, "The Gap between English Competence & Performance (Performance: The Learners' Speaking Ability)," pp. 660-670, 2012.
- [2] M. M. Megaiab, "The English Writing Competence of the Students of Indonesian Senior High School," in WEI International Academic Conference Proceedings, Bali, 2014.
- [3] J. G. Lowerison, "Student perceived effectiveness of computer technology use in post-secondary classroom," *Computer and Education*, vol. I, no. 47, p. 25, 2006.
- [4] S. kemp, "We are social," Global Digital Snapshoot, 27 Januari 2016. [Online]. Available: <https://wearesocial.com/sg?s=social+media+users+in+indonesia>.
- [5] M. Thelwall, "Social networks, gender adn friending: an analysis of MySpace member profile," *Journal of the American Society for information science and technology*, vol. VIII, no. 59, pp. 1321-1330, 2008.
- [6] V. Stevens, "Trial by Twitter: The rise and slide of the years' most viral microblogging platform," *TESL-EJ: Teaching English as second or foreign language*, vol. XII, no. 1, 2008.
- [7] C. Mork, "Using Twitter in EFL Education," *The JALT Call Journal*, vol. III, no. 5, pp. 41-56, 2009.
- [8] P. K. Sah, "Let's Tweet to learn English: Using Twitter as a language tool in the ESL/EFL classroom," *Langlit: an international peer-reviewed open access journal*, vol. II, no. 1, pp. 10-17, 2015.
- [9] E. Harmandaoglu, "The use of twitter in language learning and teaching," in International conference "ICT for language learning" 5th edition, Florence, 2012.
- [10] G. A. Grosseck, "Can we use Twitter for Educational Activities?," in The 4th International Scientific conference eLSE: elearning and software for Education, Bucharest, 2008.
- [11] H. Y. C. a. N.-Y. Chang, "A literature review on Twitter-assisted learning and its potential application in ESL/EFL writing," in The Asian Conference on Education, Osaka, 2012.
- [12] D. Astuti, "The Gap between English Competence & Performance (Performance: The Learners' Speaking Ability)," pp. 660-670, 2012.
- [13] Y. h. C. B.-P. Sulfasyah, "Indonesian teachers' implementation of new curriculum initiative in relation to teaching writing in lower primary school," *Interational journal of education*, vol. VII, no. 4, pp. 53-72, 2015.
- [14] R. Julianti, "University English Teacher and students' perception of language choice in EFL Classroom," *ELT Worldwide*, vol. III, no. 2, pp. 204-220, 2016.
- [15] K. Borau, C. Ullrich, J. feng and R. Shen, "Microblogging for language learning : using Twitter to train communicative and cultural competence," in The 8th International conference on Advance in Web based learning, Aachen, 2009.
- [16] I. Y. a. H. Tinmaz, "Using Twitter as an instructional tool : a case study in higher education," *The Turkish Online Journal of Educational Technology*, vol. XII, no. 4, pp. 209-218, 2013.
- [17] J. C. Dunlap and P. R. Lowenthal, "Tweeting the night away: Using twitter to enhance social presence," *Journal of information system and education special issue*, vol. XX, no. 2, 2009.
- [18] C. Mork, "Using Twitter in EFL Education," *The JALT Call Journal*, vol. III, no. 5, pp. 41-56, 2009.
- [19] M. a. E. A. S. Ahmed, "The Effect of Twitter on developing writing skills in English as foreign language," *Arab World English Journal*, no. 2, pp. 14 - 149, 2015.
- [20] N. k. Adam acar, "Twitter as a tool for language learning: The case of japanese learners of English," in The Eight International Conference on elearning for knowledge-based society, Bangkok, 2012.
- [21] J. W. Creswell, *Educational Research fourth Edition*, New York: Pearson, 2012.
- [22] J. W. Creswell, *Educational Research fourth Edition*, New York: Pearson, 2012.
- [23] D. Wilkinson and P. Birmingham, *Using Research instruments : a guide for researchers*, London: RoutledgeFalmer, 2003.
- [24] I. Y. a. H. Tinmaz, "Using Twitter as an instructional tool : a case study in higher education," *The Turkish Online Journal of Educational Technology*, vol. XII, no. 4, pp. 209-218, 201.

Review Urgency Implementation of *Dalihan Na Tolu* Institutions in Legal Justice System in Indonesia

¹ Ika Khairunnisa Simanjuntak

Law Faculty, University of Indonesia
The 2nd Floor of IASTH Building,
Jl. Salemba Raya No.4 Central Jakarta
E-mail: ikakhairunnisa@rocketmail.com

ABSTRACT

The Indonesian Constitution recognizes and respects the unity of indigenous and tribal peoples as long as they are alive and in accordance with the development of society and the principle of the Unitary State of the Republic of Indonesia as regulated in Article 18 B Paragraph (2) of the 1945 Constitution. This respect is grounded by tribal, indigenous and cultural pluralism that flourishes in Indonesia, which still exists largely and serves as a guideline for community life. In the event of a dispute as unavoidable in the realities of daily life, indigenous and tribal peoples often choose customary law to resolve disputes between them. Choosing customary law to resolve disputes, not only because indigenous people still adhere to their local wisdom. Another thing that also affects is the limited ability of state institutions to provide access to justice quickly and affordably for the community, especially in relation to the limited access to justice through formal justice. This is of course a significant barrier to indigenous peoples, to resolve the problems they face through formal institutions. While in public law disputes such as punishment, they can not fully rely on customary law. This fact proves that equality before the law is still difficult to achieve in Indonesia. In fact, in the history of legal practice in Indonesia, once known a special court based on an adat law. But since the reign of President Soeharto, the existence of this court was abolished. Degradation of formal justice on the one hand when faced with the large number of legal communities exist in Indonesia who live hereditary in certain legal rules, is not an easy problem. So it is important to encourage efforts to strengthen and utilize other alternatives in order to gain access to justice outside the formal tribunal by means of informal justice with various variants such as mediation (non-litigation) and the implementation of customary justice. One of the institutions known to resolve the customary law dispute is the *Dalihan Na Tolu* institution by the Batak Tapanuli community in North Sumatra, Indonesia. *Dalihan Na Tolu* is a philosophy of life that will never be abandoned by the Batak community until whenever. *Dalihan Na Tolu* has a mechanism to resolve all conflicts that occur in this group through close family meetings, custom meetings or community meetings by means of mediation or arbitration. This study aims to see how the position, role, and effectiveness of *Dalihan Na Tolu* institutions in Indonesia, especially to ensure access to justice and protection of the rights of indigenous peoples. In addition, this study also wants to see the urgency of applying *Dalihan Na Tolu* in the legal system in Indonesia.

Keyword : Dalihan Na Tolu, Legal Institution, Indonesia Legal System.

I. INTRODUCTION

Indonesia is known as a rich country with various ethnic and tribal cultures where each ethnic and tribe has long lived with their respective customs. Each custom has its own uniqueness as a guide in managing their lives. Adat for them is believed to be a legacy of ancestors who must be respected, obeyed and used as a guide in daily life. Based on Aliansi Adat Masyarakat Nusantara (AMAN) data, the total number of indigenous and tribal peoples communities joined by the alliance amounted to 2,332 indigenous communities and still retains their life as an indigenous community to date.¹

¹ Aliansi Masyarakat Adat Nusantara, www.aman.or.id (accessed 5 July 2017).

Indonesia has acknowledged and respected the unity of these indigenous and tribal peoples as long as they are alive and in accordance with the development of society and the principle of the Unitary State of the Republic of Indonesia as stipulated in Article 18 B Paragraph (2) of the 1945 Constitution. In addition Indonesia has also become The UN member that support the adoption of The UN Declaration on the Rights of Indigenous People as a form of respect for indigenous and tribal peoples.

But the written commitment has not been properly realized. Jimmly Asshiddiqie said that within 15 years of reform, Indonesia has not seriously implemented this honor mission in its public policy.² Especially in the field of law, the fulfillment of justice, legal certainty and

² Jimmly : Kontstitusi Mengakui Kesatuan Masyarakat Hukum Adat, republika.co.id, (accessed 5 July 2017).

protection of customary law community rights are still faced with a number of obstacles. Even until 2017 countless customary disputes that do not find a solution.³

The presence of formal justice is also unable to resolve this issues, especially when faced with the problem of congestion cases that must be resolved.⁴ Other issues are the limited burden of formal proof, the emergence of hatred among the disputants, the lack of judges' capacity to understand customary rules, the limited ability of the state to provide access to justice in a fast, low cost and reaching remote villages to cause unfulfilled justice in Customary dispute resolution. All these problems are the reason for the loss of indigenous peoples' trust in legal formal institutions.

Yet as a state of law⁵ and as set in the Constitution, Indonesia must be able to guarantee every citizen for equality before the law⁶, as one of the basic principles that become demands in the life of nation. On the basis of that principle, every citizen is entitled to obtain legal efforts as well as the fulfillment of human right, especially the right of justice and the guarantee of access to justice⁷ which is constitutional guarantee of human rights.

One of the best efforts that can help solve this problem is by reviving the dispute resolution procedure through customary institutions. In the Batak tribe known a *Dalihan Na Tolu* institution that has long been very successful in solving the dispute among indigenous people batak. The presence of formal justice as the only legitimate dispute resolution institution⁸ has caused *Dalihan Na Tolu* to be abandoned primarily by modern urban society. Nevertheless, until now the majority of Batak people still hold firm *Dalihan Na Tolu* as life guidance and rules of kinship system among them.⁹

It has been proved in several previous studies that there are many Batak people who still use the *Dalihan Na Tolu* to resolve their dispute. However, the position of *Dalihan Na Tolu* has not provided legal certainty because there is no legitimate of its existence as a dispute

resolution institution. Although *Dalihan Na Tolu* is revived as a recognized dispute resolution institution, it will not be able to resolve all types of cases because serious criminal cases must be submitted to the formal justice system. Therefore it is important to review the urgency of the implementation of the *Dalihan Na Tolu* in Indonesia and to determine the most appropriate position as a form of implementation in the legal justice system in Indonesia.

Based on this background, this study focuses on two things, namely: **First**, how the mechanisms and roles offered by *Dalihan Na Tolu* in settling disputes in Indonesia. **Second**, what is the urgency of *Dalihan Na Tolu's* implementation in the national justice system by first reviewing the recognition and position of customary court in Indonesia with *Dalihan Na Tolu* as one of its components.

II. METHODOLOGY

The type of research used in this study is normative juridical by examining library materials or secondary data as the main data. However, to support this secondary data, the author also conducted interviews with the Batak person in the form of clarification. Data obtained through literature study by viewing, analyzing and comparing library materials and previous research.¹⁰ While the research approach is legislation approach that is research approach by using legislation and regulation.¹¹ The reason for the selection of this approach is related to research that tries to analyze the problem from the perspective of legislation.

The secondary data used in this study can be distinguished into primary, secondary and tertiary legal materials. The primary legal material that author use is obtained directly from written legal rules, ie:

1. Constitution of the Republic of Indonesia;
2. Act No. 14 of 1970 on the Basic Provisions of Judicial Power;

³ Sengketa Adat, Aliansi Masyarakat Adat : Pemerintah Sering Lamban, www.tempo.co.id (accessed 5 July 2017).

⁴ Every year the Supreme Court of the Republic of Indonesia leaves a case that has not been decided. The remaining data of cases in 2015 reached 3,950 cases. Refer, MA Berhasil Kikis Tumpukan Perkara, www.hukumonline.com, (accessed 7 July 2017).

⁵ Article 1 paragraph (3) UUD 1945.

⁶ Article 26 Constitution of Indonesia.

⁷ Article 26 Constitution of Indonesia.

⁸ This statement is reinforced by the birth of Act No 14 of 1970 in Article 3 states that "All courts in the territory of the Republic of Indonesia is a State Court and established by law."

⁹ Interview with Mr. Arip Rahman (batak toba tribe) on July 5, 2017 in Rantauprapat City.

¹⁰ In the research is usually known at least 3 types of data collection tools, namely: document studies or library materials, observation and interviews or interviews. The three types of data collection tools, can be used each, or together to get the maximum results possible. This is because, because each type of data collection tool, has its weaknesses and advantages. *Ibid*, p. 66.

¹¹ Peter Mahmud Marzuki, *Penelitian Hukum*, (Jakarta : Kencana, 2011), p. 137.

3. Local Regulation of Tapanuli No. 10 of 1990 on Customary Institution of *Dalihan Na Tolu*.

To support and explain the primary legal material, the author also uses secondary legal materials in the form of books, scientific papers, scientific journals, and dissertations related to the field of dispute resolution and the legal system of Indonesia.¹²

In addition to the above mentioned data, the author also uses tertiary legal materials that provide guidance as well as explanations of primary legal materials and secondary legal materials, such as magazines, newspapers and the internet.¹³

III. DISCUSSION

A. Mechanisms and Role of *Dalihan Na Tolu* in Dispute Resolution in Indonesia

Indonesia consists of thousands of tribes, customs and cultures that each have their own unique characteristics. Like Batak tribe also has a uniqueness as a local wisdom that until now made the order of life and also become a source of motivation behave. That local wisdom is *Dalihan Na Tolu* which in Indonesian is often called *Tungku Nan Tiga*. *Dalihan Na Tolu* is very proud of Indigenous Batak people as a social kinship system that provides guidance for orientation, perception, and definition of reality.¹⁴

A.1. Definition of *Dalihan Na Tolu*.

Dalihan Na Tolu is actually a kinship system of indigenous Batak people based on blood relations (genealogis) and marriage.¹⁵ Not only as a kinship system, *Dalihan Na Tolu* is also respected as a living guide that regulates, controls and gives direction to the behavior and deeds of every Batak person.¹⁶ So it can be said *Dalihan Na Tolu* is the ideology of Batak society. Based on these functions, *Dalihan Na Tolu* is considered as a means to maintain the integration and identity of Batak tribe as a nation of Indonesia.¹⁷

In terms, *Dalihan Na Tolu* comes from the Batak Language which means "Tungku Nan Tiga" that is taken

from the philosophy of a traditional cooking stove that is commonly used by Batak tribe earlier.



Picture 1
Traditional Cooking Stove

According to the Batak people, the cooking stove has an analogy with family relation, because:

- a. The stove can not be separated from human life. Humans need food to live so that when talking about food it will always be related to the *Dalihan* (furnace) which is a tool for cooking food;
- b. The three stone furnaces at *Dalihan Na Tolu* are one unity as the foundation where the pots are stacked firmly for the soil, so that no fill of the pot is spilled and can be cooked perfectly;
- c. To heat or cook there must be a fire. The fire in the furnace must remain lit, so that the furnace can function perfectly. Fire is considered a clan that revives social relations and solidarity among Batak people.¹⁸

The analogy is then supported by the philosophy that *Dalihan Na Tolu* has three furnaces to create a balance in holding the cooking place.¹⁹ Three furnaces need balance

Masyarakat Batak Parsahutaon Dalihan Na Tolu di Sarua Permai, Ciputat), Dissertation on Institut Pertanian Bogor of 2008.

¹⁸ H. Sigalingging, *Tinjauan Filosofi Tentang Dalihan Na Tolu sebagai Eksistensi Masyarakat Batak*, Final Project on Universitas of Gajah Mada Yogyakarta of 2000, p. 17.

¹⁹ The stove consisting of the three stones is the foundation, where the stucco is placed firmly for cooking. Refer J. P. Sitanggang, *Raja Napogos*, (Jakarta: Jala Permata Aksara, 2010).

¹² *Ibid*, p.31.

¹³ *Ibid*, p.31.

¹⁴ Harahap H Basyral dan Siahaan Hotman M, *Orientasi Nilai-Nilai Budaya Batak*, (Jakarta :Sanggar Willem Iskandar, 1987).

¹⁵ J.C Vergouwen, *Masyarakat dan Hukum Adat Batak Toba*, (Yogyakarta: Lkis, 2004).

¹⁶ Interview with Mr. Arip Rahman (batak toba tribe) on July 5, 2017 in Rantauprapat City.

¹⁷ Charolina Margaretha, *Sosialisasi Dalihan Na Tolu Pada Generasi Muda Batak di Perkotaan (Kasus Pada Perkumpulan*

in holding the load above it.²⁰ If one of the three furnaces is damaged, the furnace will not be used. In contrast to a five or four-stove furnace, if one of its stairs is damaged then it can still be used by slightly adjusting the laying of the load on it.

Then *Dalihan Na Tolu* can be interpreted as the *tolu sahundulan* (three elements sitting together) in balance and unity. This balance means that the function of the three elements is not one-sided, whereas this unity means the three inseparable elements or they must function simultaneously.

This philosophy illustrates that *Dalihan Na Tolu* is a symbol of unity, harmony and balance created from three elements.²¹

a. *Somba Marhulahula*;

Interpreted as respect to Hula-hula. Hula-hula is a clan group of wife, clans of mothers, clans of grandfather's wives, and generations. Hula-hula is suspected as a source of blessings and descendants that must be upheld and respected.

b. *Elek Marboru*;

Defined as gentle and unconditional affection to Boru.²² Boru is a daughter or clan group that takes the wife from our daughter. The gentle attitude to the boru is necessary because she/he has the role of helping on customary activities.²³ Without the presence of boru, the implementation of an adat feast is impossible.

c. *Manat Mardongan Tubu*.

Interpreted as a cautious attitude with people of one clan. This cautious attitude aims to avoid misunderstanding in the implementation of custom events. The plurality of Batak tribe often causes conflicts, such as conflicts of interests, positions, and so forth.

Table 1.

Definition of Adat Philosophy *Dalihan Na Tolu*

| Filosofi | Pengertian |
|--------------------------|--|
| <i>Somba Marhulahula</i> | 1. Respect 2. Protect 3. Honor 4. Courtesy 5. Supports |
| <i>Elek Marboru</i> | 1. Serve |

²⁰ *Ibid*

²¹ This element serves to determine the status, rights and obligations of a person or group of people or organize and control the behavior of a person or group in the life of customary communities. Refer, T.M. Sihombing, *Filsafat Batak Tentang Kebiasaan-kebiasaan Adat Istiadat*, (Jakarta: Balai Pustaka, 1986), p. 71.

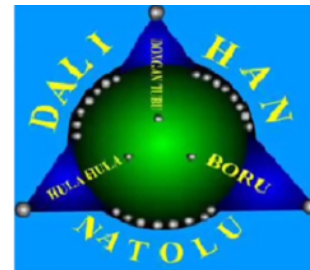
²² Batara Sangti, *Sejarah Batak*, (Balige: Karl Sianipar Company, 1977).

²³ J. P. Sitanggang, *Op.Cit*.

| | |
|-----------------------------|---|
| | 2. Gentle 3. Affection 4. Loving |
| <i>Manat Mardongan Tubu</i> | 1. Be careful 2. Cautious 3. Obey |

Source: Research Report on Hibah Bersaing Nurdian Amin, 2014.

So the Batak people symbolically have a pattern like an equilateral triangle. Each corner is an important position in regulating the rights and obligations of each kinship group.²⁴



Picture 2
Symbol Dalihan Na Tolu

The core of *Dalihan Na Tolu* is mutual respect and helping each other. It does not talk about one-way relationships but talks about the mutual and team work between each element in it with all the anticipatory and reactive actions that arise in every shared activity.

The placement of na tolu is not a caste because every individual batak tribe will have all three positions depending on the time and condition. There are times when someone will become Hula-Hula, Dongan Tubu or Anak Boru. To maintain that balance, every person in Batak must realize that everyone will ever become Hula-Hula, ever become Boru, and once a Dongan Tubu.²⁵

Beside to the previously mentioned functions, *Dalihan Na Tolu* also serves as the basis for consensus of Batak tribe.²⁶ This is because *Dalihan Na Tolu* is a legal guidance to every community. Because of its function as the basis and components in Batak forum, *Dalihan Na*

²⁴ Kondar Siregar dkk, "Pencegahan Praktik Prositusi Berbasis Masyarakat Adat *Dalihan Na Tolu*", *Journal Mimbar Hukum*, Volume 28, No 3 of 2016, p. 419.

²⁵ Three positions in Dalihan Na Tolu are called not immortal or not caste because every Batak person will in turn experience these three positions depending on the event he faces.

²⁶ Marbun, M.A dan Hutapea. I. M. T, *Kamus Budaya Batak Toba*, (Jakarta: Balai Pustaka, 1987), p. 37.

Tolu then used as a dispute settlement institution for the Batak tribe.

A.2. Mechanism *Dalihan Na Tolu* in Resolving Various Dispute .

The dispute resolution mechanism of *Dalihan Na Tolu* institution is very close to the *musyawarah* tradition. Since the basic is a deliberation, its implementation is done through family meetings or customary meetings such as mediation in alternative dispute resolution, of course with the presence of the three elements of *Dalihan Na Tolu* as the hallmark of this institution.

Dalihan Na Tolu (Hula-hula, Dongan Tubu, and Boru) in dispute resolution acts as executor of the dispute settlement process. The three working directly in the meeting by meeting to discuss about problems or dispute.²⁷ Indeed, the Hula-Hula and Dongan Tubu act as parties directly involved in the deliberations, whether to give peace approval, apologize or implement sanctions which are all very dependent on the dispute model. While boru only serve as the party that prepares events such as determining the place of deliberation, inviting the parties needed, providing food into the dish in the deliberations and etc.

In addition to the presence of the three elements of *Dalihan Na Tolu*, the settlement of the dispute is led by a mediator named *sihal-sihal*. *Sihal-sihal* is selected from the elders or people who are respected by the parties in the community. *Sihal-sihal* must come from outside parties or people who are not involved in conflict or dispute. It aims to maintain neutrality and justice. However, *sihal - sihal* can also be chosen from the element of *Dalihan Na Tolu*, if the conflict or dispute to be resolved is privacy or light.

Sihal-sihal acts as a mediator or interpreter and decision-makers or dealers as a way out of dispute of the parties.²⁸ To be a *sihal-sihal* should be considered the following things:

1. Competence, ability, best insight in the field:
 - a Knowledge of *Dalihan Na Tolu* on indigenous people of Batak;
 - b Basis of problems being faced by both parties.
2. Wisdom, dignity and personality of a person in the midst of indigenous people of Batak.²⁹

Disputes settlement through this institution is pursued to achieve peace. With firmness in holding the values of *Dalihan Na Tolu* each party is required to create a condition of kinship and happiness. In some cases, a win-win solution is not difficult to achieve as each party has been strongly bound by the inward pressure to respect *Dalihan Na Tolu*'s values. Moreover, each person has also displayed a moral obligation and personal commitment to obey.³⁰

This is of course very different from formal judiciary that is so procedural that many indigenous people to be confused even try to avoid it.³¹ In addition, the threat of family outbreaks due to Court decisions (losing-win mechanisms) by Judges who do not have a bond to them causes them to be reluctant to go to court.³²

A.3. The Role of *Dalihan Na Tolu* in Dispute Settlement in Indonesia.

Dalihan Na Tolu regulate and control the life of Batak people not only in the context of adat bonds, but also in the economic, religious, political, and even bureaucracy.³³ As a guide to life as well as the basis of deliberation and consensus, *Dalihan Na Tolu* has an important role in the settlement of disputes. The types of disputes settled through *Dalihan Na Tolu* are as follows :

- a. Marriage Dispute Settlement;

Solving the problems that often occur in marriage Batak people will not be done without *Dalihan Na Tolu*,³⁴ because the element of *Dalihan Na Tolu* from the parties is the main implementer of the dispute settlement that has the initiative in finding out the current dispute,

²⁷ Mega Veronika Tamba dkk, *Dalihan Natolu Role In Traditional Marriage Portland, Oregon Sekar Rose Country Village of Sand Turtle Indragiri Upstream*, History Education FKIP- University of Riau, p. 7.

²⁸ Wira Susanty Manalu, *Eksistensi Penyelesaian Alternatif Pada Masyarakat Batak Toba Study di Kota Medan*, Dissertation on Sekolah Paska Sarjana Program Study Kenotariatan University of Sumatera Utara, 2009, p 33-48.

²⁹ Anwar Sadat dan Ahmad Laut Hasibuan, "Model Pelaksanaan Mediasi Melalui Pranata *Tutur* Pada Masyarakat Batak Muslim Tapanuli Selatan", *Journal Afkaruna*, Volume 12 No 2 December of 2016, p. 268.

³⁰ Doangsa P.L, Situmeang, *Dalihan Natolu Sistem Sosial Kemasyarakatan Batak Toba*, (Jakarta: Kerabat, 2007), p xvi

³¹ Wira Susanty Manalu, *Op. Cit*, p. 10.

³² *Ibid*, p. 67.

³³ Armaidy Armawi, "Kearifan Lokal Batak Toba *Dalihan Na Tolu* dan Good Governance Dalam Birokrasi Publik", *Journal Filsafat*, Volume 18, No 2 of August 2008, p. 164.

³⁴ Doni Boy Faisal Panjaitan, *Peranan Dalihan Natolu Dalam Hukum Perkawinan Masyarakat Adat Batak Toba (Studi Mengenai Hukum Perkawinan Adat Batak di Kecamatan Balige)*, Dissertation on Law Faculty University of Sumatera Utara of 2010, p. i.

what, why, and how the dispute occurred, then invited to gather, and deliberate to resolve the current dispute.

In practice, the role of *Dalihan Na Tolu* as mediator is effective enough to help solve marital problems in Batak people, if *Dalihan Na Tolu* has been involved, it will be definitely found a solution to the problem. Basically the result of the mediation's decision is to seek harmony not a separation, although sometimes there are differences of opinion between the three elements of *Dalihan Na Tolu*.³⁵

b. Inheritance Dispute Settlement;

As with marital disputes, *Dalihan Na Tolu* also has an important roles in the settlement of inheritance disputes. Batak people embrace the patrilineal kinship system, which takes into account family members according to the lineage of the father. As a result only boys get inherited while girls get a share of their husbands' parents or through grants. Therefore, boru has no position in this inheritance dispute. Settlement of inheritance disputes through *Dalihan Na Tolu* is done through a deliberative approach involving elements of *Dalihan Na Tolu*.

c. Land Dispute Settlement;

Land dispute is also done by the method of deliberation and involves the elders as a mediator and three elements of *Dalihan Na Tolu* as parties. Interested parties are required to show valid and strong evidence to be used as a basis for peace. Legal evidence may be proof of Headman (anyone eligible to issue land), Certificate of Inheritance or other evidence that can be accounted for. Based on the evidence, the elders can decide who has the right to the land.³⁶

d. Economic Dispute Settlement;

Although *Dalihan Na Tolu* has less influential in economic activities, in fact each of the economic actors from Batak society really involves members of relatives in developing their economic business. They assume that it is better to provide an economic opportunity to the family itself than by giving that opportunity to others.³⁷

³⁵ *Ibid*, p. 8.

³⁶ Wira Susanty Manalu, *Op. Cit*, p. 80.

³⁷ Robert Siburian, *Dalihan Na Tolu dan Kegiatan Ekonomi : Studi Kasus Pada Orang Batak Toba di Porsea*, Dissertation on Social and Political Science Faculty University of Indonesia of 2004, p. 210-211.

³⁸ Tota Pasaribu, *Kewenangan Dalihan Na Tolu dalam Penyelesaian Tindak Pidana Secara Hukum Adat Batak Toba (Studi di Kec. Borbor, Kab. Toba Samosir)*, Dissertation on Law Faculty University of Sumatera Utara of 2008, p.x.

Thus *Dalihan Na Tolu* is also used in case of economic dispute among Batak people.

e. Settlement of Criminal Cases.

In addition to the settlement of cases in the private domain, *Dalihan Na Tolu* is also used to resolve cases in the public aspect such as criminal cases. This is motivated because written criminal law in Indonesia can not regulate all the legal needs of the community. In settling the criminal case, *Dalihan Na Tolu* has a very big role especially in resolving complaints such as adultery, domestic violence, oral insults, slander or defamation and other criminal acts such as disruption to the general welfare.³⁸ The sanctions granted to perpetrators are excluded from their customary communities, paying the compulsory penalty to the victim, apologizing to the victim or even his family before the elder, as well as the obligation to bear all meal expenses incurred when the criminal act is resolved.³⁹

The dispute settlement mechanism should be preceded by complaints from the public or parties who feel harmed by a crime. Then the elder who acts as an adat judge, attended by all the parties directly solves the dispute. If one party is not present then the dispute can not be resolved, including by presenting the victim, perpetrator, witness and all elements of *Dalihan Na Tolu*.⁴⁰

B. Urgency and Position of *Dalihan Na Tolu* in the Legal Justice System in Indonesia.

B.1. Urgency *Dalihan Na Tolu* in the Legal Justice System in Indonesia;

Customary law is part of life of Indonesian nation. However modern Indonesia, will never be separated from this law because Indonesia consists of various kinds of indigenous peoples who have never understood the custom as an entity separate from the law.⁴¹ Although not written, the true customary law is what certain groups of people believe as the right way of living according to their sense of justice and propriety.⁴² This rationale concludes

³⁹ *Ibid*.

⁴⁰ J.C. Vergouwen, *Masyarakat dan Hukum Adat Batak Toba*, (Jakarta: Pustaka Aset, 1986), p. 432.

⁴¹ Ratno Lukito, *Hukum Sakral dan Hukum Sekuler Studi Tentang Konflik dan Resolusi Dalam Sistem Hukum Indonesia*, (Jakarta : Pustaka Alvabet, 2008), p. 37.

⁴² I Gede A.B. Wiranata, *Hukum Adat Indonesia Perkembangannya dari Masa Ke Masa*, (Bandung: Citra Aditya Bakti, 2005), p. 21.

that *Dalihan Na Tolu* can still exist as a justice seeking institution for the community, especially the indigenous people of Batak.

It has been mentioned earlier that formal justice has not been able to bring justice for the people to this day, especially when faced with adat issues. In contrast, the persistence of Batak society in respecting *Dalihan Na Tolu* still exists to this day. This became the main force to make *Dalihan Na Tolu* local wisdom as dispute settlement.

Data released by The Asian Foundation states that "86 percent of respondents believed that deliberation is preferable to court or other formal procedures as a means of settling legal disputes".⁴³ Especially in the Batak customary meeting, the results of Anwar Sadat and Ahmad Laut Hasibuan's research in 2009 show that 85% of respondents answered that the result of the decision issued based on the result of deliberation from the Batak people is very acceptable, and there are 10.83% regular answer and 4.17% answered Less acceptable.⁴⁴

Table 2.

Respondents' answers about the public perception of the marriage dispute settlement from the results of deliberation organized by Batak people

| No | Respondents' answers | Amount | Percent |
|----|----------------------|------------|------------|
| 1 | Very Acceptable | 102 | 85 |
| 2 | Regular | 13 | 10.83 |
| 3 | Less acceptable | 5 | 4.17 |
| 4 | Not acceptable | - | |
| | | 120 | 100 |

Source: Primary Data 2009⁴⁵

It can be assessed that the majority of Batak people trust the settlement of marriage disputes through *Dalihan Na Tolu* rather than resolved through the courts, as they consider the verdicts delivered based on the results of deliberations to provide more justice, benefit and legal certainty. This condition is influenced by several things:

1. Dispute settlement through deliberation is a settlement that has long been maintained since the time of the ancestors;
2. The parties acting as decision makers shall be respected because they are from the royal lineage, adat leaders and representatives of the *Dalihan Na Tolu* family;
3. Dispute settlement based on deliberation has very strict requirements and procedures, so the subject of the problem can be known. Subsequently, the provision of appropriate decisions to the parties is witnessed by the entire community so that the public can supervise the execution of the decision;
4. The sanctions imposed on the results of the deliberations are moral sanctions by considering civil sanctions such as compensation, fines, revocations of certain right, and etc.⁴⁶

In general, the urgency of customary institutions including *Dalihan Na Tolu* in dispute resolution are:⁴⁷

1. Limited adat people access to existing formal justice;
2. Traditional societies still have a strong legal tradition under their traditional law. This is a reality where tradition or custom still prevails in many places in Indonesia;
3. The type of problem solving offered by formal justice is considered inadequate and lacks justice in communities that still hold their own legal traditions;
4. Lack of infrastructure and resources possessed by formal justice to fulfill the justice of the local community.

Another problem is the very serious buildup of cases. As a note, when viewed at the highest state judicial institution, the data of the YLBHI indicates that at the end of every year there are 8 thousand cases remaining in the Supreme Court.⁴⁸

B.2. Position *Dalihan Na Tolu* in Legal Justice System In Indonesia.

Customary justice⁴⁹ existed in Indonesia within the scope of the state justice system. But its existence was explicitly abolished by the Soeharto government through Law no. 14 of 1970 on Kekuasaan Kehakiman.

⁴³ The Asia Foundation, *Survey Report on Citizens' Preceptions of The Indonesian Justice Sector (Preliminary Findings and Recommendation)*, The Asia Foundation, 2001.

⁴⁴ Anwar Sadat dan Ahmad Laut Hasibuan, *Op. Cit.*, p. 268.

⁴⁵ *Ibid*, p. 273

⁴⁶ *Ibid*, p. 266.

⁴⁷ Eva Achjani Zulfa, "Keadilan Restoratif Dan Revitalisasi Lembaga Adat di Indonesia", *Journal Kriminologi Indonesia*, Volume 6, No II of August 2010, p. 182 – 203.

⁴⁸ Tunggakan 8 Ribu Perkara Tiap Tahun Jadi Tantangan Ketua MA Baru, www.news.detik.com, (accessed 10 July 2017).

⁴⁹ For instance are *Inheemsche Rechtspraak* (Customary Justice) and *Zelfbestuur Rechtspraak* (Swapraja Justice).

Nevertheless, adat justice is not simply abolished because certain communities are still bound by their respective customary law rules. Even then the existence of the judiciary increasingly existed when local governments provided 'recognition' in the form of local regulations.

The *Dalihan Na Tolu* Institute for example has been recognized through the Regional Regulation of Tapanuli Number 10 of 1990 as a deliberative institution whose task is to preserve and preserve the local culture for the purpose of development and its consultative nature to the government.⁵⁰ This institution is located in the Village, Sub-District, District at the District level.⁵¹ However, based on data search, the author did not find any specific mention of the presence of this institution as a dispute resolution institution. Even if its presence also includes dispute resolution, its scope will be very limited to the Tapanuli area only.

The basic question to be answered from this section is how does this institution relate to the national legal system?⁵² Is it right apart or united? What is the position of *Dalihan Na Tolu* institution desired in the judicial system in Indonesia? To address this, consideration should be given to the possibilities of court and adat institutions.

First, positioning *Dalihan Na Tolu* institution as a formal institution. Model formalization in the national justice system which has been put forward in the writings of Lilik Mulyadi (2013),⁵³ is assessed to impose the Supreme Court. This is also inconsistent with the concept of the importance of recognition of the pluralism of customary justice practices in various regions. This form of formalization has consequences on formal procedural mechanisms and procedural-based procedural standards. It is also difficult to determine the competence of customary courts.

Second, positioning *Dalihan Na Tolu* as a non-formal institution outside the national justice system. This possibility of positioning *Dalihan Na Tolu* does not depend on the presence or absence of state

acknowledgment but prioritizes public awareness to choose the *Dalihan Na Tolu* institution rather than formal justice. As we mentioned earlier this possibility causes the decision of the *Dalihan Na Tolu* institution to have no legal certainty even though this weakness has been overcome by the supervision of indigenous peoples, sanctions from indigenous elders if the verdict is not enforced and awareness of each customary law community to comply with *Dalihan Na Tolu*.

Third, positioning *Dalihan Na Tolu* as a complementary by unifying formal legal logic with informal legal logic.⁵⁴ The problem of this position is the contradiction between customary law and national law. This possibility is procedurally perceived as *nebis in idem* if the decision of indigenous elders is reexamined at the national court level.

In this study the best position according to the author is to propose a "Choice of Law". As for the minimum requirements of legal choice:

1. Prioritizing substantive justice is not limited to formal justice or mechanisms;
2. The settlement of cases enabling the choice of law should reflect the principle of justice that focuses on the interests of the victim, either indigenous or non-indigenous.

This choice of law is based on community judgment and personal awareness to choose the best type of settlement that can resolve their dispute.⁵⁵ This legal choice is based on:

1. Not all cases can be settled through *Dalihan Na Tolu* institutions for example cases involving big companies or cases involving non-indigenous people (ex : Manggarai Tambang Mangan case);
2. The institution of *Dalihan Na Tolu* should be viewed as a solution with a more dynamic mechanism,⁵⁶ as well as having a sociological significance;
3. National judiciary and *Dalihan Na Tolu* institutions have different legal logic and are separate from the state's formal law and justice. Enforcing submission

⁵⁰ Article 6 of Regional Regulation No. 10 of 1990.

⁵¹ Article 5 and 7 of Regional Regulation No. 10 of 1990.

⁵² This question wants to answer the application of customary law in two levels of legitimacy, be it social legitimacy (indigenous community) and political legitimacy (state recognition).

⁵³ Lilik Mulyadi, "Hukum dan Putusan Adat dalam Peradilan Negara", Paper for the Joint National Dialogue of HuMa Society and Supreme Court, Royal Kuningan, of 2013.

⁵⁴ The possibility of this position is submitted by the Working Team of the Ministry of Justice and Human Rights of the Republic of Indonesia, Refer Herlambang Perdana Wiratman,

Laporan Akhir Tim Pengkajian Hukum Tentang Peluang Peradilan Adat Dalam Menyelesaikan Sengketa Antara Masyarakat Hukum Adat dengan Pihak Luar, (Jakarta : Kemenkumham, 2013), p. 33.

⁵⁵ *Perluakah Menghidupkan Kembali Pengadilan Adat?*, www.hukumonline.com, (accessed 10 July 2017).

⁵⁶ The formalization of customary justice in the national justice system will remove the dynamic nature of customary justice itself. An example is the Central Kalimantan (Kedamangan) customary court. Refer Herlambang Perdana Wiratman, *Op. Cit*, p. 31.

under the formal law of the state would be contrary to respect for customary law;

4. Both the *Dalihan Na Tolu* and the national justice institutions have their respective strengths and weaknesses which the people can consider before choosing;
5. The fact that some acts which according to the consciousness of the law of society are a disgraceful act, the rule of national law does not regulate it so as to create a legal vacuum, for example: Criminal Code of Indonesia.

To support the implementation of this choice of law, it should be followed by local government recognition of the *Dalihan Na Tolu* as a dispute settlement institution. It is also important to encourage public confidence to resolve traditional disputes through customary justice. This can be achieved by promoting the workings of customary justice in accordance with the principles of local wisdom, social justice and human rights.

IV. CONCLUSION

The conclusions from this study are:

1. *Dalihan Na Tolu* is a kinship system of indigenous Batak people based on blood relation (genealogical) and marriage which is not only respected as life guidance but also believed to be a dispute settlement institution among indigenous Batak people. The dispute settlement mechanism through *Dalihan Na Tolu* is implemented through deliberation and consensus by involving the three elements of *Dalihan Na Tolu* namely Hula-hula, Dongan Tubu, and Boru as the driving force of the dispute settlement process. The settlement of the dispute is led by a mediator named sihal-sihal elders or people who are respected by the disputing parties in the community. This mechanism has several advantages over the formal justice mechanism. The *Dalihan Na Tolu* Society plays a role in solving various community problems such as marriage, inheritance, land, economic and criminal issues;
2. Formal justice has not been able to achieve community justice, especially when faced with adat issues. Past research also mentions that people are more confident in resolving traditional disputes than formal justice. There are three possible positions of customary justice in the national justice system. However the best attitude to determine the position of the *Dalihan Na Tolu* institution is to provide an opportunity for the legal choice of the parties with the foregoing considerations. This attitude should be followed by local government recognition of the

Dalihan Na Tolu agency as a dispute settlement institution and increasing public confidence to resolve traditional disputes through customary courts.

Effects of Self-Assessment on Writing of Thai EFL Students in Different Groups of Learning Styles

¹ Jakkrapong Thongpai, ² Poranee Deerajviset, Ph.D.

¹ Master Degree Student, Department of English
Faculty of Humanities and Social Sciences, Khon Kaen University, *Khon Kaen, Thailand*

² Assistant Professor, Department of English
Faculty of Humanities and Social Sciences, Khon Kaen University, *Khon Kaen, Thailand*
E-mail: ¹ manyjack@gmail.com, ² poranee.dee@gmail.com

ABSTRACT

Effective self-assessment will help language learners to objectively assess and evaluate their writing skills efficiently [1, 2]. It is also realized that the effectiveness of self-assessment of learners is affected by their learning styles [3]. As a result, the purposes of this research were: (1) to explore the preferred learning styles of Thai EFL students, (2) to examine the effects of self-assessment on writing skills of Thai EFL students in different groups of learning styles, and (3) to examine the attitudes of Thai EFL students in different groups of learning styles towards the use of self-assessment in writing. The participants of this study were 68 second year English major students who enrolled in 411232 English Essay Writing course in the second semester of the academic year 2016 at the Faculty of Humanities and Social Sciences in Khon Kaen University. The research instruments consisted of 1) Felder and Soloman's (1991) Index of Learning Styles questionnaire, 2) the essay writing pretest and posttest, 3) the self-assessment checklist, 4) the attitude questionnaire, and 5) the interview. SPSS program was used to figure out the percentage, mean, standard deviation, and t-test. Content analysis was also employed to analyze the interview. The findings from Index of Learning Styles questionnaire revealed that most of students were Visual learners, followed by Global, Sensing, Active, Reflective, Intuitive, Sequential, and Verbal learners respectively. After participating in self-assessment training, all groups of students with different learning styles could get the posttest score higher than pretest. A group of students who can learn best with Reflective learning styles could get the highest different mean scores between the essay writing posttest, followed by the group of students with Global, Visual, Intuitive, Sensing, Verbal, Active, and Sequential learning styles respectively. Most of students found the self-assessment checklist useful for revising their written work which helps them to point out the strengths and the weaknesses of their own writing. They pointed out that the most useful group of items of the self-assessment checklist is organization (introduction, body, conclusion) while the most difficult group of items to self-assess is grammar and mechanics. However, comparing with self-assessment, most of students were more comfortable about getting feedback from the teacher. As a result, they suggested that self-assessment should be combined with teacher feedback.

Keywords: Learning Styles, Self-Assessment in Writing, Thai EFL Students

I. INTRODUCTION

Writing seems to be the most difficult skill for EFL learners to acquire in academic contexts [4, 5, 6, 7, 8]. It is obviously seen that a number of research reveals the attempt of scholars on finding out the appropriate teaching and learning methods for learners with different background and contexts. In term of emphasizing writing skills on continual metacognition, students are required to learn to objectively assess and evaluate idea and expression in order to facilitate continual improvement of writing assignment [1, 2]. In EFL writing classroom, Oscarson [9] asserts that the positive interaction is found between students and teachers while dealing with self-assessment activities. Learner autonomy of students will be increased by realizing their own strengths and weaknesses in their own writing [10, 11, 12].

However, despite the potential benefits of self-assessment have been recognized, the effectiveness of self-assessment as a measurement tool has still been questioned by language teachers [3, 13]. The risks of using self-assessment for evaluating students' learning

outcome and grading are the obvious concern [12]. The difficulty of implementing self-assessment to a large group of students is the most obvious limitation in terms of time consuming as the teacher may be required to frequently deal with the problem on grammatical inaccuracies of the low-proficiency students in the group [14]. This should be taken into account when using self-assessment.

In addition, it is difficult for EFL students to do self-assessment as they are familiar with traditional assessment and have not much opportunity to experience self-assessment [15]. In Thailand, for example, English writing courses have been provided for Thai students to enroll in by most of the universities as both compulsory and elective courses [8]. However, the use of English is very limited in classroom in which teachers focused on dealing with marking and correcting students' writing assignments [16]. The problems of Thai EFL students when conducting self-assessment in writing include insufficient language capability, L1 interference, limitation of time, and bias which influence students to

satisfy with their first draft and believed that any change was not required [17].

Some significant research in the field of educational psychology and Second Language Acquisition (SLA) has been conducted in relation to learning styles and the practice of self-assessment with regard to language skills [18]. Birjandi and Bolghari [3] also claim that the effectiveness of self-assessment of learners is affected by their learning styles. Thus, it is interesting to explore different learning styles of EFL writing learners in terms of their writing improvement towards self-assessment practice.

In Thai EFL context, even though some studies [e.g., 19, 20, 21, 22], employed the subjects of the equivalent background as well as the equivalent models of learning styles assessment, it is clearly seen that learning styles preference of different groups of students can be either similar or different. However, there are relatively small numbers of studies on learning styles of Thai EFL learners, especially studies towards writing skills improvement which are rarely found [21]. As a result, this study will try to fill this gap of research on employing the self-assessment method to EFL writing classroom in order to examine its effects on writing skills of students in different groups of learning styles. The research questions are as follows:

- What are the preferred learning styles of Thai EFL students?
- What are the effects of self-assessment on writing skills of Thai EFL students in different groups of learning styles?
- What are the attitudes of Thai EFL students in different groups of learning styles towards the use of self-assessment in writing?

II. LITERATURE REVIEW

A. Self-Assessment in Writing

Self-assessment as a formative assessment process starts when the quality of work and learning are reflected and evaluated, followed by the judgment of reflection degree based on goals or criteria, as well as indentifying strengths and weaknesses of writing before making revision if necessary [23, 24, 25]. Students can use self-assessment checklist to effectively plan the writing outline and validate their arguments through the provided evidence by realizing the weaknesses of their writing in terms of missing or lacking elements [26].

In addition to the evaluation of one's own work, self-assessment can be implemented to support the development of critical self-awareness skills of students [12]. Self-assessment can be used as a part of the entire

learning process to help learners discover their behaviors, as well as recover their previous knowledge, and increase their self-esteem and self-motivation [27]. Sahragard and Mallahi [18] added that self-assessment practice has a reflective role in the learning process and can be used while dealing with the variety of language skills. They clarified that, as for writing, this practice can refer to any method which inspires students to consider, evaluate, and respond to their own writing. Self-assessment also plays a significant role in verifying individual learning effectiveness, enhancing an inherent motivation, and promoting the preparation for life-long learning [28, 29]. Iraj, Enayat, and Momeni [28] also claimed that self-assessment can be used as a learning tool to lower anxiety of students and improve their writing skills.

Apart from the limitation of language proficiency, one of the key factors that affects either the inadequate implementation or ineffective use of self-assessment is the students have not been trained to self-assess their own writing [2, 3, 17, 30, 31, 32, 33]. For the effective implementation, many scholars [e.g., 17, 30, 31] suggest that learners should also be directly trained on how to use self-assessment approach and checklist by educating the main purpose, assessment criteria, or rating scale before the actual implementation [3].

B. Learning Styles

The term "learning styles" which is considered as another factor affecting self-assessment of learners have been discussed by scholars [e.g., 3, 18]. The interest in learning styles issue has investigated through a number of studies, proposed models, and instruments for learning styles assessment [34]. For instance, Ahmed [35] revealed that students experience some writing difficulties when they are taught regardless to their different learning styles. Fleming [36] found that students fall into more than one sensory modality of learning styles category. In this regard, Alkhatnai [37] pointed out that students' perceptions of their learning styles are affected by their personality types, cultural beliefs, and teacher's teaching styles. In terms of second language learning, Zafar and Meenakshi [38] defined learning styles as the "cognitive variations" emphasizing on the preferred way of individuals to deal with information (process, perceive, conceptualize, organize, and recall) to facilitate language learning. Learning styles are considered as the key factors for representing how and how well the learners gain knowledge of a second or foreign language [39, 40, 41].

A number of learning style models and their description have been proposed and investigated (e.g., Dunn & Dunn 1975, 1989, 1982; Fleming, 2001; Kolb, 1976, 1985, 1999; Reid, 1987; Willing, 1988). Some models have become exceptionally influential and well-known, e.g., the Dunn, Dunn and Price's Learning Styles

Inventory is used in the US, while both Kolb's Learning Style Inventory and Honey and Mumford's Learning Styles Questionnaire are widely known and used in the UK [11]. Measurement or criteria of any learning style model is presented through its inventory, or checklist, or questionnaire as a key instrument or a part of methodology for learning style assessment. Some instruments are concise and easy to use particularly in written or computer format such as Felder and Soloman's (1991) Index of Learning Styles or ILS [42, 43] which based on Felder-Silverman's (1988) learning styles model of five dimensions: Processing (Active/Reflective), Perception (Sensing/Intuitive), Input (Visual/Verbal), Understanding (Sequential/Global), and Organization (Inductive/Deductive).

Felder and Spurlin [44] explain that the ILS instrument categorized learner preference into one or another of each four pairs-dimensions. *Sensing/Intuitive*: a sensing learner can be a concrete or practical thinker who relies heavily on facts and procedures, while an intuitive learner refers to an abstract or innovative thinker who relies heavily on theories and underlying meaning. *Visual/Verbal*: a visual learner prefers visual representations of presented material, while a verbal learner prefers written and spoken explanation. *Active/Reflective*: an active learner likes trying things out and enjoys working in group, while a reflective learner likes thinking thoroughly and prefers working alone or with a familiar partner. *Sequential/Global*: a sequential learner learns in small incremental steps through linear thinking process, while a global learner learns in large leaps through holistic thinking process.

Despite the fact that studies on learning style preferences of language learners in different EFL contexts through various learning style assessment tools have demonstrated the importance of this issue, the focus towards the effect on writing skills has still not been critically discussed among EFL educators [18, 21]. In this regard, it is found that some scholars [e.g., 35, 45] recommended that the composition teachers can gain a potentially valuable perspective of their students' needs by identifying their learning styles which will be beneficial for the improvement of writing skills.

As a result, this study focuses on training ELF university students the use of self-assessment checklist in writing classroom in order to examine its effects on writing skills of students in different groups of learning styles, as well as their attitudes towards using it.

III. METHODOLOGY

A. Participants of the Study

The sampling group of this study, selected by purposive sampling technique, is 68 undergraduate

students majoring in English at the Faculty of Humanities and Social Sciences in Khon Kaen University. They enrolled in 411232 English Essay Writing course in the second semester of the academic year 2016 as the second year students. Prior to taking this course, this group of students has already studied the 411231 English Sentence and Paragraph Writing course during the first semester of the same academic year. The 411231 course involves students to practice writing the sentences using basic structure of paragraph which are considered necessary for essay writing. For this study, only process essay as one among three types of essay writing of the 411232 English Essay Writing course (descriptive, narrative, process) is mainly focused.

B. Research Instruments

In this study, five research instruments are employed: (1) index of learning styles questionnaire, (2) the essay writing pretest and posttest, (3) the self-assessment checklist, (4) the attitude questionnaire, and (6) the interview.

Felder and Soloman's ILS [46] is employed as the learning style assessment tool for this study which has parallels to other well known learning style instruments but is more concise and easier to use in online format. The ILS is a free and online questionnaire with 44 items asking the respondent to choose one of two endings to a sentence in order to assess preferences on four pairs-dimensions (active/reflective, sensing/intuitive, visual/verbal, and sequential/global) of a learning style model of Felder and Silverman (1988). After answering the questions and submitting the survey (<http://www.engr.ncsu.edu/learningstyles/ilsweb.html>), the four pairs of learning preferences are reported back immediately with a set of learning style description.

The self-assessment checklist is the adapted version of Honsa's self-assessment checklist for essay writing [17], Nimehchisalem et al.'s self-assessment checklist for argumentative writing [47], and El-Koumy's self-assessment checklist for writing processes [48]. The checklist provides 25 items for considering the 6 issues of writing process essay which include the format, organization, vocabulary, grammar and mechanics, sentence structure, and fulfill the task.

For the attitude questionnaire, a set of 23 statements with 5 rating scale is adapted from the studies of Bing [49], Muñoz and Alvarez [50], and Vasu et al. [51] in order to investigate students' attitudes in terms of benefits, limitations, and suggestions towards using self-assessment method to improve their writing skills.

C. Research Procedure

This study was conducted throughout 9 weeks during the second semester of the academic year 2016. During

the first and third week, the ILS online questionnaire was introduced to the participants by the researcher through the explanation and giving examples. They were required to respond to each statement quickly without too much thought and try not to change the responses after choosing them. After being identified and described individual learning styles, all participants sent the reports to researcher. Participants were then taught about the definition and structure of process essay, as well as how to write process essay. After that, they were assigned to write the essay writing pretest on the topic “How to Prepare Yourself for the Examination” which consists of around 500 words for a 5-paragraph process essay.

In the fourth week, participants were introduced to self-assessment through a training session. This session starts by the explanation and giving examples of all items of the self-assessment checklist. During the fifth and seventh week, participants were allowed to write another two drafts of process essay using the self-assessment checklist. Some of their pieces of writing were shown and discussed among the instructor and students in class as the examples of how and how well the assessment were made based on the items in the self-assessment checklist.

After the participants completed all writing process with self-assessment in the eighth week, they were required to write the essay writing posttest on the topic “How to Get a Good Grade” in order to examine their improvement in writing. The attitude questionnaire and interview were also conducted in the ninth week in order to gain their in-depth opinions after they finish learning to use self-assessment in writing. SPSS program was used to figure out the percentage, mean, standard deviation, and t-test. Content analysis was also employed to analyze the interview.

IV. RESULT AND DISCUSSION

A. Learning Styles of Thai EFL Students

The participants could interpret their complete ILS questionnaire by themselves using the online explanation of the scales and the implications of their own preferences through the learning styles description provided by the ILS website. The findings from ILS questionnaire, as shown in Table I, indicated that most of EFL students in this study were *visual* learners, following by *global*, *sensing*, *active*, *reflective*, *intuitive*, *sequential*, and *verbal* learners respectively. In other words, when compared the pairs of each four dimensions of learning, the majority of learners were *visual* (input), *global* (understanding), and *sensing* (perception), while the minority were *verbal* (input), *sequential* (understanding), and *intuitive* (perception). For the dimension of processing information, number of both *active* and *reflective* learners was equal. When focused on the three levels of each

learning style preference, most of the learners of each dimension were found to be in a mild or balanced level of preference except *visual* learners who had more in a moderate and strong one respectively.

TABLE I. PARTICIPANTS' LEARNING STYLE PREFERENCE

| Dimensions | | Level Learning style preference | | | | |
|---------------|------------|---------------------------------|----------|--------|--------------|-------|
| | | Mild | Moderate | Strong | Total (N=68) | % |
| Processing | Active | 23 | 8 | 3 | 34 | 50 |
| | Reflective | 21 | 11 | 2 | 34 | 50 |
| Perception | Sensing | 19 | 14 | 4 | 37 | 54.41 |
| | Intuitive | 23 | 7 | 1 | 31 | 45.59 |
| Input | Visual | 12 | 25 | 16 | 53 | 77.94 |
| | Verbal | 12 | 2 | 1 | 15 | 22.06 |
| Understanding | Sequential | 19 | 3 | 3 | 25 | 36.76 |
| | Global | 31 | 11 | 1 | 43 | 63.24 |

It is consistent with Wana and Boonyaparakob's study [52]. They revealed that the majority of 177 Thai EFL students in two universities were found to prefer *visual*, *sensing*, *active*, and *global* learning styles, as well as most of them were found to be a balanced level of preferences for the different types of learning styles. Moreover, this is also in line with other groups of EFL university students in other countries. For example, Hsu and Chen [53] conducted a study with 109 freshmen students in a college in Taiwan and found that, in the dimension of *visual* and *verbal*, the majority of participants were *visual* learners while *verbal* learners were with very low proportion. Their results also pointed out that most of the students belong to the balanced type in the rest three dimensions. Hsu and Chen [53] also claimed that their findings were similar to a previous couple studies emphasizing that the *visual* learning styles was the preferred way of learning, particularly for Asian students.

Interestingly, Felder and Spurlin [44] claimed that most of ILS dimensions have similarity or can be connected to other learning style models. Nevertheless, the results of implementing different learning style assessment tools are quite the same, slightly different, or completely different. Based on the online Memletics Learning Styles Inventory (Advanogy.com), Srijongjai [21] found that the experimental group of Thai EFL students presented social and aural learning styles as the key learning styles preference which followed by verbal, visual, physical, solitary, and logical styles respectively. This is quite similar to Khmakhien's study [19] which revealed a major learning style preference of Thai EFL students as the auditory learners through Reid' PLSPQ. Both studies may refer to Reid's (1995) study who found that Thai students in the sampling group preferred learning English by listening to native speakers through

lectures or audiotapes which may be more useful to improve their English skills rather than learning English alone.

However, there was a slightly different result in Phantharakphong's [20] study using VARK questionnaire. Phantharakphong investigated English learning styles of students in regard to high and low performance throughout the English for Teaching Profession course. The result indicated that majority of students had preferred kinesthetic and multimodal styles rather than read/write, auditory, and visual styles respectively. The high performance students rated themselves as same as the preference of most of students, while low performance students preferred multimodal, and kinesthetic styles rather than read/write, visual, and auditory styles. According to Fleming [36], it can be explained that kinesthetic learners in this study prefer using experience and practice to help them to learn well. This is in line with the study conducted by Tantarangsee [22] in order to explore the learning styles of university students in Bangkok. Honey and Mumford's learning styles questionnaire based on the four dominants of learners including reflectors, theorists, pragmatists, and activists was used with 1,383 students and 5 lecturers. The preference of learning styles were ranked from high to low level as follows: activists, theorists, reflectors, and pragmatists, which can be concluded that the majority of this study's population can learn best by doing.

B. Self-Assessment in Writing and Different Groups of Learning Styles

The pretest and posttest essay writing were evaluated and scored by a native English speaker, who has taught English writing courses in a university in Thailand for 6 years, using the adapted Paulus's essay scoring rubric [53]. Total score of this adapted rubric is 50 which are equally divided into 5 different aspects of writing: organization/unity, cohesion/coherence, structure, vocabulary, and mechanics. The findings revealed that mean scores of pretest and posttest of 68 students were 21.80 and 36.25 respectively as indicated in Table II.

TABLE II. PAIRED SAMPLES STATISTICS

| | | Mean | N | Std. Deviation | Std. Error Mean |
|--------|----------|---------|----|----------------|-----------------|
| Pair 1 | Pretest | 21.7941 | 68 | 8.01968 | .97253 |
| | Posttest | 36.2500 | 68 | 6.44697 | .78181 |

Moreover, the positive correlation between pretest and posttest was found (.744) with statistical significance at .05 level as shown in Table III.

TABLE III. PAIRED SAMPLES CORRELATIONS

| | | N | Correlation | Sig. |
|--------|--------------------|----|-------------|------|
| Pair 1 | Pretest & Posttest | 68 | .744 | .000 |

In conclusion, the t-test also indicated that the posttest scores were higher than pretest ($\bar{x}=14.46$) with statistical significance at .05 level as shown in Table IV.

TABLE IV. PAIRED SAMPLES TEST

| Paired Differences (Pretest - Posttest) | | | | | t | df | Sig. (2-tailed) |
|---|----------------|-----------------|---|-----------|---------|----|-----------------|
| Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | Lower | Upper | | | |
| -14.45588 | 5.37944 | .65235 | -15.75798 | -13.15378 | -22.160 | 67 | .000 |

This can be concluded that the writing skills of this group of EFL students are improved after taking part in self-assessment training and using the self-assessment checklist as suggested by Fahimi and Rahimi [15] and other previous studies [e.g., 17, 30, 31]. In terms of comparing students' scores based on different groups of learning styles, the differences between posttest and pretest are shown in Table V.

TABLE V. PAIRED DIFFERENCE

| Dimensions | | Total (N=68) | Mean | | |
|---------------|------------|--------------|---------|----------|--|
| | | | Pretest | Posttest | Paired Difference (Posttest - Pretest) |
| Processing | Active | 34 | 22.21 | 36.15 | 13.94 |
| | Reflective | 34 | 21.38 | 36.35 | 14.97 |
| Perception | Sensing | 37 | 22.92 | 37.32 | 14.40 |
| | Intuitive | 31 | 20.45 | 34.97 | 14.52 |
| Input | Visual | 53 | 21.92 | 36.45 | 14.53 |
| | Verbal | 15 | 21.33 | 35.53 | 14.2 |
| Understanding | Sequential | 25 | 23.04 | 36.68 | 13.64 |
| | Global | 43 | 21.07 | 36 | 14.93 |

The limitation of this comparison is that the number of students in each group is not the same according to individual learning style preference. Moreover, the ILS categorizes learner preference into one or another of each four pairs-dimensions. Nevertheless, it can be described from Table V that the students with *sensing* learning style showed the highest mean of posttest score (37.32) while *reflective* learners could get the highest difference of mean score between posttest and pretest (14.97). According to Felder and Spurlin [44], a sensing learner can be a concrete or practical thinker who relies heavily on facts and procedures, while a reflective learner likes thinking thoroughly and prefers working alone or with a familiar partner. Thus, this result may be in line with the characteristics of process essay and self-assessment checklist used in this research in which the "procedure" and "self-assessment" is the key factor of each of them.

Table V also indicated that the second highest mean of posttest score was found with *sequential* learners (36.68), followed by *visual* (36.45), *reflective* (36.35), *active* (36.15), *global* (36), *verbal* (35.53), and *intuitive* learners (34.97) respectively. The second highest difference of mean score between posttest and pretest was found with *global* learners (14.93), followed by *visual* (14.53), *intuitive* (14.52), *sensing* (14.40), *verbal* (14.20), *active* (13.94), and *sequential* learners (13.64) respectively.

Interestingly, focusing on the *sequential* learners who had the second highest mean of posttest score in this study, they also got the highest mean of pretest score as well. On the contrary, they could get the lowest difference of mean score between posttest and pretest. As *sequential* learner learns best in small incremental steps through linear thinking process [44], it can be implied that *sequential* learners in this study are initially the best at self-assessing their process essay writing comparing with other learning styles. Although the implementation of step by step self-assessment checklist could significantly improve their writing skills, the proportion of improvement was lower than all groups of other learning styles, particularly when compared with *global* learners of the same dimension of understanding information which represented the highest paired difference between posttest and pretest.

Another interesting result can be obviously seen with the dimension of information input in which the largest and smallest number of learners' learning styles was found with *visual* and *verbal* respectively. Felder and Spurlin [44] pointed out that a *visual* learner prefers visual representations of presented material while a *verbal* learner prefers written and spoken explanation. However, the *visual* learners in this study can use the self-assessment checklist on writing better than verbal learners.

C. Students' Attitudes towards Self-Assessment Checklist

The attitude questionnaire was conducted with all participants of this study. Among 23 statements of attitude questionnaire, the "very high" level or "strongly agree" of attitudes were found with only two statements including *"I think self-assessment should be combined with teacher feedback"* and *"I think self-assessment can help me to point out the strengths and the weaknesses of my own writing"* with the mean score at 4.72 and 4.63 respectively.

Students also indicated that the most useful group of items of the self-assessment checklist is the organization ($\bar{X} = 4.26$) which consisted of the suggestion on rechecking the necessary issues of composing effective process essay throughout its writing structure of introduction, body, and conclusion. In addition, it could

be presumed that the most difficult group of items to self-assess is grammar and mechanics. However, most of students thought that the self-assessment checklist could help them revising their written works ($\bar{X} = 4.34$) so that they will keep using self-assessment in improving their writing ($\bar{X} = 4.21$).

Some students left a comment about self-assessment in writing, for example;

"I think self-assessment is useful to check whether the essay is complete or there still be something to add. But it cannot check that the essay is right or point out where the mistakes are because the one who check is the same person who writes it, so I think self-assessment should be combined with feedback in order to make it more effective."

"I do not know that the writing of mine is right or wrong. I always think that it is perfect."

The interview was made with some learners of strong level and moderate level of each learning style preference. All of the interviewee with all learning styles agreed that the self-assessment checklist is very effective in terms of the items which cover all necessary issues for process essay writing. They also pointed that it had affected their writing skills, especially help checking the completeness of sentences, grammatical and mechanic errors.

Students with reflective learning styles who could have the highest mean of posttest score proposed that the self-assessment checklist should not be used alone due to the limitation of their English proficiency. They emphasized that it must be used with teacher feedback. However, they believed that the reflective learning styles matching to the style they really think they are. For example, they like thinking thoroughly and prefer working alone. Some students with sequential learning styles suggested that the self-assessment checklist should be added by more grammatical features.

V. CONCLUSION AND IMPLEMENTATION

It is obviously evident from this study that the self-assessment checklist and self-assessment training can significantly improve students' writing. Most of them insist to keep using self-assessment for their further writing even though some of them are not sure about their own English proficiency and some of them require teacher feedback to help them on using it more effectively.

Among the four pairs-dimensions of Felder and Soloman's ILS [46], students with *reflective* learning style preference can be the best learner on self-assessing

and improving their process essay writing, while the proportion of improvement of students with *sequential* learning styles is lower than all groups of other learning styles even though the *sequential* learners is initially the best one in process essay writing.

According to [46], though a balance of the pairs of each dimension is desirable, very little visual information is presented in most college classes: students are mainly involved in verbal information by listening to lectures and reading material written on chalkboards and in textbooks and handouts, as well as many college lecture classes are aimed at intuitive learner, and most college courses are taught in a sequential manner. As the most of participants in this study were *visual* learners, following by *global*, *sensing*, *active*, *reflective*, *intuitive*, *sequential*, and *verbal* learners respectively, these can be presumed that the learning style preferences of most of Thai EFL university students in this study are not quite suitable for connecting to the situation or context which they can learn best.

Students' learning styles can be a fundamental of understanding and planning the lessons for not only teachers who have to identify which styles students prefer, but also for students to gain benefit from strengths and improve weaknesses after recognizing their individual learning styles [54]. Learners may prefer their own learning methods, so that they can comfortably use them to gain knowledge [55]. In addition, it is important for teachers to know their learners' preferred learning styles in order to help them to plan their lessons to match or adapt their teaching and to provide the most appropriate and meaningful activities or tasks to suit a particular learner group [35, 56].

REFERENCES

- [1] D. Kostons, T.V. Gog, and F. Paas, "Training self-assessment and task-selection skills: a cognitive approach to improving self-regulated learning," in *Learning and Instruction*, vol. 22, 2012, pp.121-132.
- [2] K. J. Nielsen, "Peer evaluation and self assessment: A comparative study of the effectiveness of two complex methods of writing instruction in six sections of composition," 2011, Doctoral dissertation, Boston University
- [3] P. Birjandi and M.S. Bolghari, "The relationship between the accuracy of self-and peer-assessment of Iranian intermediate EFL learners and their learning styles," in *Theory and Practice in Language Studies*, vol.5 no. 5, 2015,pp. 996-1006.
- [4] K. Barkaoui, "Teaching writing to second language learners: Insights from theory and research," in *TESL Reporter*, vol.40 no.1, 2007, pp. 35-48.
- [5] Y. Kim and J. Kim, "Teaching Korean university writing class: balancing the process and the genre approach," in *ASEAN EFL Journal*, vol.7 no.2, 2005, pp. 69-90.
- [6] G. M. Negari, "A study on strategy instruction and EFL learners' writing skill," in *International Journal of English Linguistics*, vo.1 no.2, 2011, pp. 299-307.
- [7] J.C. Richards and W.A. Renandya, *Methodology in language teaching: An anthology of current practice*, New York: Cambridge University Press, 2002.
- [8] S. Watcharapunyawong and S. Usaha, "Thai EFL students' writing errors in different text types: the interference of the first language," in *English Language Teaching*, vol.6 no.1, 2013. pp. 67-78.
- [9] A.N. Oscarson, *Self-assessment of writing in learning English as a foreign language: a study at the upper secondary school level*, Göteborg Studies in Educational Sciences 277. Göteborg: Geson Hylte Tryck, 2009.
- [10] V. Badrinathan, "Self-assessment and learner autonomy: challenges in foreign language teaching in India," in *Third 21st CAF Conference at Harvard*, in Boston, USA, vol.6 no.1, 2015, pp. 66-73.
- [11] F.Coffield, D. Moseley, E. Hall, and K. Ecclestone, *Learning styles and pedagogy in post-16 learning: a systematic and critical review*. London: Learning and Skills Research Centre, 2004.
- [12] M. Y. Omelicheva, "Self and peer evaluation in undergraduate education: structuring conditions that maximize its promises and minimize the perils," in *Journal of Political Science Education*, vol.1 no.2, 2005, pp. 191-205.
- [13] A. Muth'im, "Does student self-assessment assess as valid and reliable as teacher assessment?," in *Arab World English Journal*, vol.7 no.1, 2016, pp. 123 -139.
- [14] Y. Li and L. Chen, "Peer- and self-assessment: A case study to improve the students' learning ability," in *Journal of Language Teaching and Research*, vol.7 no.4, 2016, pp. 780-787.
- [15] Z. Fahimi and A. Rahimi, "On the impact of self-assessment practice on writing skill," in *Procedia - Social and Behavioral Sciences*, vol.192, 2015, pp. 730- 736.
- [16] S. Tangkiengsirisin and K. Rusma, "**Thai** students' perceptions on the direct vs. indirect written corrective feedback: a **Thai** university context," in *Arab World English Journal*, vol.7 no.3, 2016, pp. 161-176.
- [17] S. Honsa, "Self-assessment in EFL writing: a study of intermediate EFL students at a Thai university," in *Voice in Asia Journal*, vol.1 no.1, 2013, pp. 34-57.
- [18] R. Sahragard and O. Mallahi, "Relationship between Iranian EFL learners' language learning styles, writing proficiency and self-assessment," in *Procedia - Social and Behavioral Sciences*, vol.98, 2014, pp.1611-1620.
- [19] A. Khmakhien, "Demystifying Thai EFL learners' perceptual learning style preferences," in *3L: The*

- Southeast Asian Journal of English Language Studies, vol.18 no.1, 2012, pp.61-74.
- [20] P. Phantharakphong, "English learning styles of high and low performance students of the Faculty of Education, Khon Kaen University," in *Procedia-Social and Behavioral Sciences*, vol.46, 2012), pp. 3390-3394.
- [21] A. Srijongjai, "Learning styles of language learners in an EFL writing class," in *Procedia-Social and Behavioral Sciences*, vol.29, 2011), pp. 1555-1560.
- [22] C. Tantarangsee, "Learning styles of university students in Bangkok: The characteristics and the relevant instructional context," in *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, vol.7 no.1, 2013, pp. 135-142.
- [23] H.L.Andrade and Y. Du, "Student responses to criteria-referenced self-assessment," in *Assessment and Evaluation in Higher Education*, vol.32 no.2, 2007, pp. 159-181.
- [24] C. Joyce, L. Spiller, and J. Twist, "Self-assessment: what teachers think?," in *New Zealand Council for Educational Research*, <<http://www.nzcer.org.nz/pdfs/self-assessment.pdf>>; 2009 [accessed 28.12.16]
- [25] J. H. McMillan and J. Hearn, "Student self-assessment: the key to stronger student motivation and higher achievement," in *Educational Horizons*, vol.87 no.1, 2008, pp. 40-49.
- [26] Y. M. Fung and H. C. Mei, "Improving undergraduates' argumentative group essay writing through self-assessment," in *Advances in Language and Literary Studies*, vol.6 no.5, 2015, pp. 214-224.
- [27] J. Naeni, "Self-assessment and the impact on language skills," in *Educational Research*, vol. 2 no. 6, 2011, pp.1225-1231.
- [28] H. R. Iraj, M. J. Enayat, and M. Momeni, "The Effects of self- and peer-assessment on Iranian EFL learners' argumentative writing performance," in *Theory and Practice in Language Studies*, vol.6 no.4, 2016, pp. 716-722.
- [29] C. Steinkruger, "Do students' progress if they self-assess? A study in small-group work," in *University of Nebraska-Lincoln: Math in the middle institute partnership*, <<http://digitalcommons.unl.edu/mathmidactionresearch/27>>; 2007 [accessed 12.12.16]
- [30] S. Cho, "Alignment of self-assessment and peer-assessment with teacher-assessment in a university EFL writing classroom," in *Korea Journal of English Language and Linguistics*, vol.14 no.1, 2014, pp.125-147.
- [31] L. S. Lopes, "Alternative assessment of writing in learning English as a foreign language: analytical scoring and self-assessment," in *Bridgewater State University: Master's Theses and Projects*, <<http://vc.bridgew.edu/theses/13>>; 2015 [accessed 20.12.16]
- [32] D. Spiller, *Assessment Matters: Self-Assessment and Peer Assessment*, Waikato: The University of Waikato, 2012.
- [33] B.M. Warne, "Writing steps: A recursive and individual experience," in *English Journal*, vol.97 no.5, 2008, pp. 23-27.
- [34] S. Inal, O. Büyükyavuz, and M. Tekin, "A study on preferred learning styles of Turkish EFL teacher trainees," in *Australian Journal of Teacher Education*, vol.40, no.3, 2015, pp. 52-67.
- [35] O. N. Ahmed, "The effect of different learning styles on developing writing skills of EFL Saudi learners," in *British Journal of Art and Social Sciences*, vol.5 no.2, 2012, pp. 220-233.
- [36] N.D. Fleming, *Teaching and learning styles: VARK strategies*, Christchurch, New Zealand: N.D. Fleming, 2001.
- [37] M. Alkhatnai, "Learning styles of EFL Saudi college-level students in on-line and traditional educational environments," <<http://search.proquest.com/docview/867369322?accountid=27797>>; 2011 [accessed 12.01.17]
- [38] S. Zafar and K. Meenakshi, "Individual learner differences and second language acquisition: a review," in *Journal of Language Teaching and Research*, vol.3 no.4, 2012, pp. 639-646,
- [39] N. Bayatpour, M. Rostampour, and S.J. Abdorahimzade, "L2 writing ability in two various genres and EFL learners' learning styles and patterns of strategy use," in *International Journal of Language Learning and Applied Linguistics World*, vol.6 no.4, 2014, pp. 410-425.
- [40] Z. Jafarpanah and M. Farahian, "The relationship between learning styles and metacognitive reading strategy of EFL learners," in *International Research in Education*, vol.4 no.1, 2016, pp. 47-55.
- [41] R.L. Oxford, *Language learning styles and strategies*, In M. Celce-Murcia (Ed.), *Teaching English as a second language*, Boston: Heinle & Heinle, 2001, pp. 359-366.
- [42] S. Graf, S. R.Viola, T. Leo, and Kinshuk, "In-depth analysis of the Felder-Silverman learning style dimensions," *Journal of Research on Technology in Education*, vol.40 no.1, 2007, pp. 79-93.
- [43] C. W. Hsu and S. C. Chen, "A Study of EFL college students' learning styles and learning strategies," in *Journal of Modern Education Review*, vol.6 no.1, 2016, pp.1-9.
- [44] R. M. Felder and J. Spurlin, "Applications, reliability and validity of the index of learning styles," in *International Journal of Engineering Education*, vol.21 no.1, 2005, pp. 103-112.

- [45] N. B. Jones, "Applying learning styles research to improve writing processes," Paper presented at the Malaysian International Conference on English Language Teaching, Rasa Sayang, Penang, Malaysia, on May 21, 1996.
- [46] R.M. Felder and B.A. Soloman, "Index of Learning Styles," North Carolina State University, <<https://www.engr.ncsu.edu/learningstyles/ilsweb.html>>; 1991 [accessed 11.11.16]
- [47] V. Nimehchisalem, D. Y. S. Chye, S. Kaur, P. J. Singh, S. Z. Zainuddin, S. Norouzi, and S. Khalid, "A self-assessment checklist for undergraduate students' argumentative writing," in *Advances in Language and Literary Studies*, vol.5 no.1, 2014, pp. 65-80.
- [48] A.S.A. El-Koumy, "Effect of Self-assessment of writing processes versus products on EFL students' writing," Paper presented at the Tenth EFL Skills Conference, the American University in Cairo, Center for Adult and Continuing Education, on Jan 12-14, 2004.
- [49] X. U. Bing, "A study of the effects of student self-assessment on the EFL writing of Chinese college students," in *Journalism*, vol.6 no.2, 2016, pp. 91-107.
- [50] A. Muñoz and M. E. Alvarez, "Students' objectivity and perception of self-assessment in an EFL classroom," in *Journal of Asia TEFL*, vol.4 no.2, 2007, pp. 1-25.
- [51] K. Vasu, C. H. Ling, and V. Nimehchisalem, "Malaysian tertiary level ESL students' perceptions toward teacher feedback, peer feedback and self-assessment in their writing," in *International Journal of Applied Linguistics and English Literature*, vol.5 no.5, 2016, pp.158-170.
- [52] W. Wana and K. Boonyaparakob, "Thai EFL learners' learning style preferences in Thai university contexts," in *Veridian E-Journal*, vol.7 no.5, 2014, pp. 178-191.
- [53] T. M. Paulus, "The effect of peer and teacher feedback on student writing," in *Journal of Second Language Writing*, vol.8 no.3, 1999, pp. 265–289.
- [54] Y. Hou, "An investigation of perceptual learning style preferences, language learning strategy use, and English achievement: A case study of Taiwanese EFL students," <<http://search.proquest.com/docview/305138882?accountid=27797>>; 2009.
- [55] J. Muniandy, and M. Shuib, "Learning styles, language learning strategies and fields of study," in *Malaysian Journal of ELT Research*, vol.12 no.1, 2016, pp. 1-19.
- [56] M. Zhou, "Learning styles and teaching styles in college English teaching," in *International Education Studies*, vol. 4 no.1, 2011, pp. 73-77.

The Study of Philosophical Meaning of Kerawang Motives on Gayo Ethnic Traditional Clothes, Aceh Province

¹Jarwati, SE, ²Sahri Ardalina, S.Pd

¹Education Department, Universitas Negeri Medan, Indonesia

²Education Department, Universitas Negeri Surabaya, Indonesia

E-mail : ¹waty2117@gmail.com, ²sahriardalina@gmail.com

ABSTRACT

Gayo ethnic originally came from the people of Veda adherents of the Austronesian or known as Proto-Malays who brought cultures. In a further development, mixing of genetic and cultural among the Veda with a group of Austronesian is the forerunner to a tribe called Gayo. The process of deployment Gayo ethnic closely related to the expansion of the territory of the kingdom called *Linge Kingdom*, *Adi Genali* was the first king of this kingdom. Kerawang Gayo is one of art identity owned by Linge Kingdom which ultimately also an identity for Gayo ethnic. The objective of this research was to find out and identify : (1) motives of Kerawang on Gayo's traditional clothes; (2) philosophical meaning of Kerawang motifs on Gayo's traditional clothes . This research used descriptive qualitative. The data were collected by using literature, deep interview with craftsmen, traditional figures, and historical relics (artifacts). The findings of this research showed that. There are six kinds of Kerawang Gayo's motives on traditional clothes and each motif has a deep philosophical meaning. Those are *Emun Berangkat* (marched cloud), *Puter Tali* (multiple gyre) *Pucuk Ni Tuis / Pucuk Rebung* (bamboo shoot), *Tapak Seleman* (sole of Sulaiman) *Ulen* (Moon), and *Peger* (fence).

Keywords— kerawang, gayo, motives

I. INTRODUCTION

Gayo is the name of one of tribes in the province of Aceh, Gayo highland has a height ranging from 200 to 2600 meters above sea level. Currently, Gayo highland has been divided into two parts of Aceh Tengah and Bener Meriah Regency [1].

Kerawang is designation of the carving patterns of Gayo [2]. Kerawang usually found on wooden houses, woven materials, pottery, metal, and fabric. Historically, Kerawang engraving was first found on the ornament of *Umah Pitu Ruang* (custom home of Gayo). *Umah Pitu Ruang* was dowry or demand of a princess from Kingdom of Johor (Malaysia) who had been proposed by *Adi Genali* , the first king of Kingdom of Linge (Kingdom of Gayo). Motives of Kerawang that had been found on ornaments of *Umah Pitu Ruang*, furthermore were applied as decoration motives on art material ,included traditional clothes of Gayo ethnic. Motif is a pattern style that became the starting point to create a form of stylized ornamentation that serves to decorate a room or object fields of life.

Motifs of Kerawang has a big role in the history of Gayo[3]. Kerawang Gayo is not just a motif without philosophy. Motif on Kerawang Gayo contain the mandates, advices for society. Also, it was a communication tool that had been used by Gayonesse long time ago. "Kerawang is one of diverse customs system for Gayo people. This system was manifested by a wide shaped ornamental motif engravings and is a signs carrying messages implied behind the symbol / mark of the Gayo's ancestor . Behind the sign there were messages

/ advices from the ancestors for the next generation of Gayo [4].

Each motif of Kerawang has its own philosophy, this study examines the philosophy contained in motives of Kerawang Gayo on traditional clothes of Gayo ethnic .Focusing is done in Kerawang Gayo of Bener Meriah and Aceh Tengah

II. METHOD

This research is descriptive qualitative. A descriptive qualitative is a way that allows for knowing the circumstances or conditions of case today. Descriptive method is an idea or event that is happening at the present [5]. The descriptive qualitative method who is used in this study aims to understand various and Philosophical Meaning of Kerawang Gayo's motives on the traditional clothes of Gayo ethnic, Aceh Province.

The research location is in Gayo Highland , those are Bener Meriah and Aceh Tengah Regency, Aceh Province as the centers of Kerawang Gayo. The sample in this study adjusted for purposes of research that will seek the broadest possible description. Therefore, the sampling technique used was purposive sampling or sampling aims. Researchers also will use the internal sampling, the researchers determined based on the needs of the informant.

To obtain these data, the data source of this research includes:

1. The informant made up of artists, artisans, entrepreneurs, users, as well as competent figures with Kerawang Gayo.

2. Events and Behavior: events or behavior that becomes the source of data is the events or actions related to the creation, production, marketing, and use of Kerawang Gayo Motives.
3. Document: This document in the form of notes or publications about Kerawang Gayo. Included in the data source document is of commentaries and writings in newspapers / magazines / and internet regarding Kerawang Gayo and socio-cultural background of its creation.
4. Artifact: Artifacts used in this study of Traditional Clothes of Gayo Ethnic.

III. DISCUSSION

Gayo region is located in the middle of the mountains of Aceh that is attached to Bukit Barisan, positioned at the far northern tip of Sumatra island. According to historical records, previously, Gayo highlands is an area *Negeri Antara* territory which stretches from the Karo (North Sumatra) to Cut Panglima (Aceh).

Gayo ethnic's ancestors originally came from the people of Veda adherents of the Austronesian or known as Proto-Malays who brought culture Neolithikum [6]. In a further development, mixing of genetic and cultural among the Veda with a group of Austronesian is the forerunner to a tribe called Gayo.

The process of deployment Gayo ethnic closely related to the expansion of the territory of the Kingdom of Linge [7]. Linge kingdom is an ancient kingdom in Aceh. This kingdom was formed in the year 1025 AD (416 H), the first king was Adi Genali. Linge kingdom in Gayo is one of the main kingdoms that have supported the establishment of the Aceh Darussalam kingdom. Without the support of the Linge Kingdom, it can be ascertained that the Kingdom of Aceh Darussalam will never exist in the history of Aceh. The existence of Linge Kingdom in Gayo is very closely related to the presence of the Aceh Darussalam kingdom. Moreover, the first King of Aceh Darussalam Kingdom is the original Gay ethnic who is the biological son of *Reje Linge* named *Merah Johan*, also known as Sultan Ali Mughayatsyah.

Kerawang Gayo is one of identity art which is owned Linge Kingdom that eventually become an identity for gayo ethnic. Kerawang Gayo is a call for embroidery found on kerawang itself. Whereas, embroidery found on traditional house called carving. Then, contained in mats called *belintem*. Basically, they have the same meaning of the motifs, only the placement and usage is distinguished [8].

First time, carving motives found on ornamental *Umah Pitu Ruang* (traditional house of Gayo). Then, those motives were adopted into the typical handicraft

from Gayo, one of which was a motif in traditional clothes of Gayo. Traditional clothes is a pride of the community [9]. From that opinion, it seems clear that traditional cloth is an absolute human need that was needed to fulfill for human survival. In other words, traditional clothes is a primary need that is no less important than other basic. Human efforts to fulfill primary needs through the clothes raises cultural diversity. Traditional clothes is formal wear in an area. Meanwhile, the custom is a rule implemented from generation, either hereditary rules, or made is on the basis of the norms [10].

On customary law of Gayo, traditional clothes of Gayo has motifs : *Emun Berangkat* (marched cloud) , *Puter Tali* (tali berpilin), *Pucuk ni Tuis / Pucuk Rebung* (bamboo shoot), and *Tapak Seleman* (tapak nabi Sulaiman) [11]. Whereas, according to Pinan, basic motifs kerawang Gayo consists of five basis motives, if there are additional motifs of Kerawang, these are the result of developments of basis motifs. While, the five basic motifs are (1) *Emun Berangkat* (2) *Puter Tali* (3) *Pucuk Rebung* (4) *Tekukur* (5) *Rante*.^[12] However, based on the results of the study of literature, observation and interviews to several craftsmen and custom figure , it was found that the motifs always appear in traditional clothes of Gayo are : *Emun Berangkat* (marched cloud), *Puter Tali* (multiple gyre), *Pucuk ni Tuis / Pucuk Rebung* (bamboo shoot), *Tapak Seleman* (sole of Sulaiman), *Peger* (Fence), *Ulen* (moon). Motives of Kerawang on traditional clothes of Gayo has a unique pattern, which has a deep philosophical meaning of each engraving and shape.

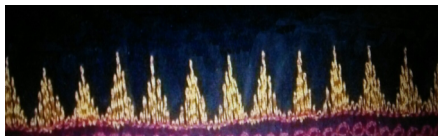
Motif of *Emun Berangkat* (marched cloud) is a geometric motif shaped with concentric circles, elongated, and continued repeatedly. This motif is interpreted as a form of clouds lined up in the sky. People describe that clouds marching across the sky as a symbol of togetherness, happiness and harmony.



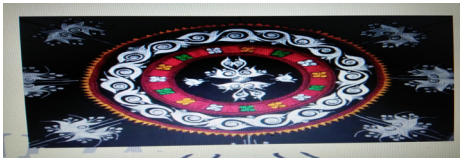
Motif of *Puter Tali* (multiple gyre) is a motif in the form rope spinning or twisting double. The philosophy contained in *puter tali* motif is the spirit of unity and mutual helping are in keeping the country and live in society.



Motif Pucuk Ni Tuis / Pucuk Rebung (bamboo shoot) is a triangle-shaped motifs that are interconnected with each other or in rows. *Pucuk Rebung* is new shoots of bamboo that grows in the form tapered of bamboo. Philosophy of shape *Pucuk Rebung* or bamboo shoots was a portrait of natural fertility in the Gayo, green and cool place, making life comfortable and peaceful. So, overall it appears markers resulting from existing forms. Thus, the overall its meaning describe how people in Gayo life. Bamboo shoots which form a triangle is a symbol of robustness. The young generations who have the mental strength and good leadership will realize the nation into a developed country.



Motif of *Ulen* (months) is a circular motif is interpreted moon as a symbol of light for the world. Formation of several motifs curved form concentric circles to a point meaning life goals. Motif *Tapak Seleman* (soles of Sulaiman) inspired by the Prophet Sulaiman As, motif of *Tapak Seleman* are vertical and horizontal lines that intersect. Each corner of the line pieces are lingkaran-circle touches the line. The left and right of the vertical line is limited by the range of the amount of more than one line.



Motif of *Tapak Seleman* (sole of Sulaiman) inspired by the Prophet Sulaiman AS. Motif *tapak seleman* are vertical and horizontal lines that intersect. Each corner of the pieces of the line there are circles touching the lines. The left and right of the vertical line is limited by the range of the amount of more than one line. Gayo ethnic gives meaning *Tapak Seleman* motif as a symbol of the supernatural, grandeur, power and protection. The philosophy of this motif is in the Gayo ethnic is a problem solved wisely and prudent to conduct deliberations and always be fair in taking a decision.



Motif of *Peger* (fence) is a row of vertical stripes like a fence arranged in groups with different colors. The composition of each group is alternately vertical lines between the colors to one another. The meaning of *Peger* is defense and maintaining order in the country / village.



The motifs on Kerawang Gayo consists of several colors: black, yellow, red, white, green. Elements of the colors also have a certain meaning and philosophy.

- Black is the color of the base Kerawang shows the symbols of the earth
- Yellow means *Musuket Sipet* (thoughtfully)
- Red means *Musidik Sasat* (courage)
- White meaningful need *Sunet Kesucian* (Differentiate between good and bad)
- Green means *Genap Mufakat* (deliberation).

IV. CONCLUSION

Kerawang Gayo is one of the most important identity for Gayo ethnic. There are six kind of Kerawang motives on the Traditional clothes of Gayo ethnic. Those are *Emun Berangkat* (marched cloud), *Puter Tali* (multiple gyre), *Pucuk Ni Tuis / Pucuk Rebung* (bamboo shoot), *Tapak Seleman* (sole of Sulaiman), *Peger* (Fence), and *Ulen* (moon). Each motif on it has a deep philosophical meaning that were believed as the guidelines of life for Gay.

REFERENCES

- [1] Santifa, Oriza. 2015. Statistik Daerah Kabupaten Aceh Tengah. Aceh Tengah: Badan Pusat Statistik Kabupaten Aceh Tengah. Page
- [2] Ibrahim, Mahmud. 2009. Nilai-Nilai Pendidikan Islam dalam Adat Gayo. Banda Aceh. Al Mumtaz Institute,
- [3] Melalatoa, M.J. 1990. Kebudayaan Gayo. Jakarta: Balai Pustaka
- [4] MN, Joni. 2016. Falsafat Daya Bahasa dan Adat Istiadat Gayo Bernilai High Superior. Takengon : Yayasan Pendidikan Prima
- [5] Nazir, Moh. 2012. Metode Penelitian. Jakarta: Ghalia Indonesia
- [6] Hammadin. 2015, Bumi Gajah Putih, Menguk Mutiara yang Terpendam. Bener Meriah
- [7] Sufi, Rusdi dkk. 2013. Gayo Sejarah dan Legenda “ Badan Arsip dan Perpustakaan Aceh
- [8] Hiswanto, Sufandi. 2012. Pengertian Kerawang Gayo Skripsi. Banda Aceh: Unsyiah
- [9] Koten, dkk. 1991. Pakaian Adat Tradisional Daerah Propinsi NTT. Yogyakarta: Departemen Pendidikan dan Kebudayaan

- [10] Ali.1991. Kamus Besar Bahasa Indonesia. Jakarta: Balai Pustaka
- [11] Qanun No.9 of 2002 line 26, paragraph 2
- [12] Pinan, A.R. Hakim Aman. 2003. Syari'at dan Adat istiadat. Takengon: Yayasan Magamam Mahmuda.

The use of Google- Assisted Language Learning (GALL) on Improving Primary School Students' Verb-Noun Collocation Use in Sentence Level Writing

Jintana Srisuwan, Sukhum Wasuntarasophit

Department of English
Faculty of Humanities and Social Sciences
Khon Kaen University
Khon Kaen, Thailand
E-mail: yingsrisuwan@gmail.com

ABSTRACT

Learning collocation is essential in facilitating language learners to succeed in using language as fluently as native speakers do (Nation, 2001). In the field of writing, collocation can influence the effectiveness of sentence writing, and the lack of collocation knowledge might decrease the accuracy of sentence writing (Howarth, 1998). The current study aims to investigate the effects of using Google-Assisted Language Learning (GALL) and the students' perceptions towards using GALL on improving verb-noun collocation use in sentence-level writing. A pre- and post-test, an interview, and Google search were administered to thirty-three sixth grade students who were sampled in this study. The data obtained from the pre- and post-test were analyzed by using statistical method paired-samples *t*-test. The data obtained from the interview were interpreted and reported descriptively. The results from the pre-test and post-test revealed that the students' verb-noun collocation use in the simple sentences improved significantly after they obtained the treatment. In addition, the students' opinions from the interview disclosed that most students perceived the beneficial aspects of using GALL, and mostly agreed that Google search could help them learn and improve their collocation use in writing, and they intended to use GALL in their collocation learning in the future.

Keywords : Google-Assisted Language Learning (GALL); Google search; verb-noun collocation; sentence-level writing; primary school students

I. INTRODUCTION

According to Nation (2001), it is important to learn words that co-occur together in order to improve vocabulary knowledge and help students learn English language better. Words occur together with certain words are called collocation e.g., do homework or answer the phone. Sinclair (1991) defines collocation as two or more words co-occurred together in a text. Collocation is considered an essential dimension in language learning due to the way words combine in collocation is fundamental to all language use (Hill, 2000). Also, collocation plays an important role in facilitating language learners to achieve standard English fluency, and improves reading, listening, speaking, and writing skills (Howarth, 1998). In the field of writing, Nattinger and DeCarrio (1992) claimed that the advantages of storing collocation can become an effective tool to extend L2 writers' storages when they are taught to replace different components properly and in practical ways. Furthermore, Laufer and Nation (1995) recommended that an effective writing can increase students' accurate use of vocabulary, and learning collocation can enhance productive skills. Therefore, when studying collocation, students not only learn how words co-occur but also the grammatical structure of the collocation; the students can express their ideas in writing clearly and accurately (Lewis, 1997).

Although collocation is acclaimed to be crucial, it is still problematic for non-native language learners (Wray, 2002). It is found that even advanced EFL or ESL learners also have some difficulties when using collocation (Nesselhauf, 2003). However, they handle with the formulaic language (e.g. collocations and idioms) which they think if they put the words together, the language might be formed. This is opposite to the way English native speakers naturally produce collocations as they hear and speak intuitively (Durrant & Schmitt, 2009). Non-native language learners have some problems on making collocation errors in their sentences because of their interference with their mother language, lack of collocation concept, and lack of understanding of the collocation knowledge (Bahns & Eldaw, 1993). Thus, when comparing with native English speakers, EFL students made a lower percentage of conversational collocation (Howarth, 1998).

Previous studies on collocation in Thailand have investigated students' collocation competence and the problematic issues of using collocation in the English language (e.g.; Hou & Pramoolsook, 2012; Hamad; 2013; Wasuntarasophit, 2015). For instance, Hou and Pramoolsook (2012) examined the use of Corpus of Contemporary American English (COCA) to identify collocational errors and improve non-English major students' collocation use in writing tasks. Hamad (2013)

investigated the effects of using an online dictionary and intensive involvement task on Thai university students' verb-noun collocation use. Wasuntarasophit (2015) also investigated the collocation use of university students majoring in English by using explicit instruction to enhance the students' collocation knowledge and perceptions. For collocation instruction in other levels, Usen (2015) used collocation as a technique for teaching vocabulary to increase sixth-grade students' vocabulary knowledge. Also, Lin (2002) surveyed the effects of collocation instructions on receptive and productive collocation competence of high-achievers and low-achievers in a group of EFL high school students. Tseng (2002) used an explicit collocation instruction on high school students. These studies have been done to help improve collocation use on primary school, high school, or even university level, but there are no or perhaps very few studies have been done with primary school level using GALL as a concordance on an inductive instruction of collocation.

The sixth-grade students from the Intensive English Course (IEC) program of the Khon Kaen University Demonstration Primary School (Suksasart) study English for 8 periods a week and they interact with an English native speaker more than the students in regular classes. They are expected to be able to speak and write about themselves with simple sentences, and provide coherent information. They are determined to write at a sentence level and to be able to write accurately. For this purpose, this study provides a new attempt to use GALL as a language learning tool with primary school level. In order to proof the effectiveness of GALL, this study aims to investigate the effects of using GALL and examine students' perceptions towards using GALL on improving their collocation use in sentence-level writing. Two main research questions are provided to find answers: (1) to what extent can GALL improve collocation use in the sixth-grade students' sentence-level writing? (2) What are the sixth-grade students' perceptions towards using GALL on improving their collocation use in sentence-level writing?

II. LITERATURE REVIEW

Collocation instruction in English writing classroom

As collocation is considered a key to fluency and plays an important role in teaching and learning language, Nesselhauf (2005) studied collocations in a corpus of L2 learner on German advanced learners of English, and suggested that instead of teaching new and rare words, teachers should expand students' knowledge by teaching them new collocations. Hill (2000) also supported the idea of teaching collocations after observing intermediate students who are able to identify words in a conversation, but they do not understand the collocations. Collocation

can be learned by memorizing whole sentences or phrases and constantly using them in conversations (Laufer, 1994). Nation (2001) pointed out that knowing collocation is accepted as the basis of language learning and use, both of which are important for learning the most frequent words to occur in a language. Thus, gaining knowledge of collocation can enhance students' productive skills and help them write their sentences clearly and accurately (Lewis, 1997).

Since teaching collocations has emphasized in English writing classrooms, both native and non-native English teachers need to put efforts to enhance EFL students' writing by spending time to correct their writing (Namvar et al, 2012). Bahn and Eldaw (1993) addressed that the majority of EFL students have different problems in their sentence-level writing. Hill (2000) found that although students have a lot of good ideas to express, they often lose marks because they do not know the common collocations that are important in their writing, especially at the sentence-level. This applies to both beginner and advanced levels of EFL students. However, the use of collocations in writing is fruitful and frequently provides better communication than the actual form of a sentence. Namvar et al (2012) stated that using collocations in students' writing can improve the ability of creating more native-like sentences. This means that in order to enhance students' writing ability, they need to use collocations in their writing. Nation (2001) also mentioned that if students are not aware of using words that occur together, they may struggle in listening, reading, speaking and writing. Thus, these reasons for teaching and learning collocation should be emphasized in English classroom in order to support and encourage students to use language accurately and fluently like native speakers.

Data-driven learning (DDL)

Definition of DDL

The term Data-Driven Learning (DDL) originally derives from computer science relating to software which can be learned from new data. Referring to the definition of DDL, it is obvious that DDL means different things to different people. DDL may refer to the involvement of whole texts which are extracted from a corpus (Flowerdew, 2005). However, DDL is frequently related to concordances or KWICs (key words in context) but may be featured as whole sentences in the DDL course "*Focus on Vocabulary*" by Schmitt and Schmitt (2005). Johns (1986) was one of the first people who applied DDL in language learning in order to show the uses of corpora. He introduced and combined the term Data-Driven Learning (DDL) with corpus-based language learning. Although he never provided a clear definition of DDL, the term simply refers to a new language instructional approach used to teach lexical and grammatical items inductively and involves the use of

corpora and concordances by learners for language learning purposes.

DDL as an inductive approach

DDL is an inductive approach which indirectly presents word meanings and grammatical rules. As mentioned by Zhen (2005), the approach is likely to be much more student-centered and makes use of a strategy known as 'noticing'. Noticing is the process of students becoming aware of something in particular. The students are presented the examples, they come to understand the rules by noticing what the examples have in common, and they are asked to find more rules. In fact, the students often notice things that are unknown not only to the teacher, but also to the standard works of reference on the language. In the inductive classroom, the presentation of new language uses and patterns are commonly found in course books, and create part of a general strategy to allow students to engage in what they learn, in such circumstances they are able to understand the rules (Robinson, 1997). From the study by Lee and Liou (2003), it was found that when students are involved in inductive learning, they are likely to be more successful after given a DDL lesson. Thus, in DDL classroom, the data can be taken from linguistic corpora and the learners can learn the word meanings and grammatical rules indirectly and in an inductive way.

Google-assisted language learning (GALL)

Google-assisted language learning is based on the DDL approach in order to promote using Google in teaching and learning language. Powerful search engines, particularly those represented by Google, have been suggested as easy-to-use concordances that students can use to explore the large amount of data provided in the internet in order to draw language support and help students learn target language (e.g. Chinnery, 2008; Shei, 2008; Conroy, 2010).

Chinnery (2008) indicated that search engines could function as another way to maintain context while searching for authentic texts in Google search. For example, a search for the word 'coffee' introduces students to words that occur together such as 'roasted coffee' or 'steaming coffee'. Additionally, students might be curious about the different synonyms for 'coffee' which can be compared through the frequencies of their usage at Google search. As a result, a search for 'cup of coffee, cup of mud, or cup of java' will not only inform the curious students of the common use of 'cup of coffee', but also that 'cup of joe' is not uncommon in the United States, particularly in New York. To explore synonyms by using Google search, students can add a prefix in front of a given word with a symbol character (e.g., ~coffee), which searches not only for a given word, but also frequent or popular related words.

Moreover, Shei (2008) used Google search results to identify the occurrence of subsequences. This allows

students to study certain collocational words and phrases, and to check collocational words they used in writing represent common usage. He also designed a visual tool that represents the frequency of certain word combinations, and their results. For instance, in the sequence "have been found to be infected with", the result "have been" is more frequent than "have been found". The frequencies certainly become smaller as more words are included in the analysis, which means the two-word sequence may have occurred more frequent than the three-word one. The students thus may use this to guide their choice of collocations.

Conroy (2010) examined how Internet-based reference tools facilitate English as Additional Language (EAL) for students at Australian universities in their academic writing. After attending a short training session on how to use Google search and online dictionaries for their English writing, 165 EAL university students were given 2 to 4 weeks to use the tools themselves during writing. They were examined on their uses and attitudes toward these tools before and after the training. Of those surveyed, 90% of the students showed positive attitudes toward GALL and concordances for language learning and support in writing. While many of the students had been already been using Google search as a reference tool before the training, their primary search techniques were simple and rough, especially for content searches. It is suggested that specific search techniques and strategies are needed to use Google search as a concordance to cover in the training for the students. The findings also revealed that the students preferred to use Google search for the online corpora. It should be noted that based on the limitations of support for writing provided by many Australian universities, EAL students need to get training in the use of GALL and concordance techniques in order to improve their writing.

In conclusion, teaching and learning collocations is the key to help improve the students' ability to produce English language naturally as well as communicate in English fluently. The previous studies have shown problems of wrong inaccurate combinations of lexical collocation. When students lack English collocation knowledge, they transfer their first language into second language, which results in, incorrect and unacceptable word combinations. Moreover, DDL is an inductive teaching approach which has been applied to the current study in order to promote and encourage self-autonomous learning, and construct the students' own knowledge by using GALL as a concordance in learning language features, uses, and patterns. Therefore, the primary purposes of this study are to understand and investigate the use of Google search to improve students' collocation use in their writings, the researcher of this study is motivated to conduct this study.

III. RESEARCH METHODOLOGY

Participants

Thirty-three sixth-grade students were sampled in this study by a simple random sampling technique. In this experimental study, the students were required to write about themselves with simple sentences, and make their sentences understandable. The students were encouraged to write accurately at the sentence level. The students study English everyday for eight periods a week, along with an extra period of English Club.

Research instruments

Pre-test and post-test

The pre-test and post-test were designed as a form of sentence-writing test in order to assess the students before and after the treatment. The sentence-writing test was based on the collocational writing test of Hamad (2013). The thirty-three students were required to compose five simple sentences about themselves by using verb-noun collocations. The data from the pre-test and post-test obtained from the students' five simple sentences using verb-noun collocations were firstly marked and the scoring rubrics of writing simple sentences were adopted from Grant (2005). Then, the pre-test and post-test were analyzed in a basic statistic method by using a paired-sample *t*-Test to find the differences from the significant value of the mean difference.

Interview

The main purpose of the interview was to gather students' perceptions and opinions toward using GALL to help improve their collocation use in their sentence-level writings. The structured interview used in this study was developed from Yoon (2014). The five open – ended questions were conducted and administrated to ten out of

| Test | n | \bar{X} | S.D | Mean difference | Std. Deviation | t | Sig. (2-tailed) |
|-----------|----|-----------|-----|-----------------|----------------|-------|-----------------|
| Pre-test | 33 | 14.94 | 3.4 | - | 2.784 | - | .000 |
| Post-test | | 17.58 | 2 | 2.636 | | 5.511 | |
| | | | 1.6 | | | | |
| | | | 7 | | | | |

thirty-three students who were volunteered to do the interview after finishing the questionnaire. The data obtained from the interview were interpreted and reported descriptively. Content analysis was used to interpret the verbal data from the interview (Harwood & McMahon, 1997). In this study, the data analysis was structured so as to describe students' opinions toward using Google in learning collocations. The interview questions were recorded and asked in Thai in order to help the students avoid misunderstanding.

Procedures

The procedure for this study was over a span of two weeks during which the students participated in one period per a day. The interval of each period lasts approximately forty-five minutes.

In the procedure, the students were first administrated the pre-test on composing five simple sentences by using verbs with nouns without knowing the words they used in their sentences would be corrected or not. As the collocation type in this study focused on verb-noun collocations, Wu, Franken and Witten (2010) mentioned that verb-noun collocations were the most challenging lexical collocation for the students and changing the verb or noun may change the meaning of a whole sentence. The collocation items used in this study were selected from Unit 1 'School and Work' in an English course book "Get Smart 6". The words included five verb-noun collocations which were *take-*, *make-*, *check-*, *deliver-*, and *collect-*. Then, GALL techniques were introduced to students. Sessions focused on teaching students how to use Google search to improve their collocation use when writing sentences. When using Google search, the students were given exercise handouts to practice using verb-noun collocations in their writing. Afterwards, the students were administrated the post-test to determine their improvement on the use of collocations in writing sentences. They were also given a questionnaire to investigate how the treatment helped improve students' collocation use in their writing.

VI. RESULTS

The effects of using GALL to improve collocation use in students' sentence-level writing

The findings from this topic contribute to answering Research Questions 1— *To what extent can GALL improve collocation use in the sixth-grade students' sentence-level writing?*. A paired-sample *t*-Test was performed to examine and compare the differences between students' ability to write simple sentences using verb-noun collocation in the pre-test and post-test. The statistic outcomes are presented in Table 1.

Table 1 Effects of using GALL to improve collocation use in sentence-level writing

Table 1 displays students' improvement of collocation use from the pre-test and the post-test. The mean score of the students' pre-test was 14.93, and the mean score of students' post-test was 17.57. The standard deviation in the pre-test was 3.42 and in the post-test 1.67, which meant the students' scores in the post-test were higher than the students' scores in the pre-test. The mean difference was -2.636, which was found by deducting the mean of the post-test from the mean of the pre-test. The negative sign of the difference indicates that the mean of the post-test was higher than the mean of the pre-test. The significant value of the mean difference was .000 which was smaller than .01 ($p < .01$). Therefore, the difference was statistically significant, indicating the students'

collocation use in simple sentence-level writing was improved in the post-test after they obtained the treatment. The statistics revealed that all thirty three students made considerable progress in overall learning. *Students' perceptions toward using GALL on improving their collocation use in sentence-level writing*

In this section, the results retrieved from the interview are illustrated to answer Research Question 2: *What are sixth-grade students' perceptions towards using GALL on improving their collocation use in sentence-level writing?* In the following section, the findings are analyzed into four topics as follows: benefits of using GALL, challenges of using GALL, GALL for using English collocations in sentence-level writing, and students' future application of GALL in English class. The data from the interview reported the students' positive perceptions towards using GALL on improving their collocation use in their sentence-level writing.

Benefits of using GALL

The students' opinions on the interview showed that they were on the whole positive in their perceptions and opinions of using Google search a supplementary tool in learning collocations, saying that it helped them to learn vocabulary and collocations while supporting autonomous learning styles. In the following topic, major benefits of use are presented and discussed from specific comments given by the students in terms of usefulness. The positive impression of learning English collocations through the use of Google search was evident in data from the interview with ten students. In the interview, the students' perceptions were observed by asking Interview Question 1 *'Do you think Google is useful for learning collocation? In what way?'*. In response to this question, most students answer positively towards using Google search, which means the usefulness of Google search facilitated them in learning collocations. The students also expressed their opinions on how Google search helped them learn collocations and discover collocations. Six out of ten students similarly agreed that Google search helped them explore unknown collocations and find their meanings. They said the usefulness of Google search helped them share and discuss which collocation word is correct or incorrect with their classmates, and helped them use proper word choice and collocations when writing. Most students had positive perceptions and similar opinions on how Google search helped them in learning and improving their collocation use in writing.

Challenges of using GALL

In this section, the students also provided comments of the challenges and difficulties they experienced with Google search. These perceptions and opinions were in response to Interview Question 2 *'What are the problems when you use Google search? Please explain and suggest your solutions toward the problems?'*, Some of students informed their reasonable opinions and gave their

suggestions to solve the problems they found during using Google search. The challenges of using Google search can be categorized into three main points which are 1) technical difficulties, 2) improper language use, and 3) unreliable information.

1) Technical difficulties

From the students who were interviewed, two out of ten students claimed difficulties in connecting to the internet, thereby disabling access to any language learning resources. Also, the Google search application on smart phones was an overlooked convenience for the students to access the necessary tools. Another technical problem is that Google sometimes loaded slowly, which might be due to the quality of the internet; therefore, good quality hi-speed internet is also necessary for searching and accessing online resources.

2) Improper language use

Students occasionally had problems comprehending the language of some online resources, and they also found the misinterpreted contents searched through Google. Three out of ten students said that incorrect pairs of collocations and the misinterpretations of collocation meanings were found in some online resources searched through Google search. The problematic language use of writers to the Web had the potential to confuse about which word is appropriate or inappropriate to use. In such instances, the students needed to use an online collocation dictionary to check the correct pairs and the meanings.

3) Unreliable information

Some students proclaimed unreliable information being presented on the internet. Because much of the content on the Internet was published by both native and non-native speakers, especially when information was searched through Google search, some students might not be able to consider which one is reliable. Two out of ten students replied that unreliable information occasionally appeared in online resources if the students searched through Google search. The suggestions from some students were to check the reference resources of the information, and to choose the resources or websites which contain reputable references.

GALL on using English collocations in writing

In response to Interview Question 3 *'Do you think Google helps you in using collocation in your written production? How does it help you?'*, three out of ten students expressed positive responses toward the helpfulness of Google search. Some students gave suggestions through this interview question that Google search helped them discover new collocations and use new words for composing sentences. They found Google search to be helpful in learning to use English collocation in writing by perceiving how native speakers write and applying the techniques of those writers in their own writing. Also, because of the quick and easy-to-use

functions of Google search, one student reported that if he was unsure about the words he was using, he could perform a simple search on a Google.

Students' future application of GALL in English class

In responding to how GALL helped the students in using English collocation in writing, all ten students expressed positive perceptions and opinions when asked Interview Question 4 '*Do you think that you will use Google as a supplementary language learning tool in the future after this course? Why or why not?*'. Most students perceived as helpful for them to enhance their collocation use in writing and they would use it for their collocation learning in the future. All ten students declared a willingness to use Google search as a supplementary tool in learning and using English collocation when writing in the future. The students said that Google search facilitated them in checking the correctness of vocabulary and collocation meanings, searching for the collocations they wanted to know, and having more appropriate and various kinds of word choices and collocations. Also, it was suggested that some students who do not know the meanings of collocation may be able to learn new words from searching in Google. A few of the students found websites online that supported the search for collocations such as collocation dictionaries which showed examples of using verb-noun collocations in sentences.

When the students were asked if they would like to use Google search in the future or not in Interview Question 4, they were also asked to share their opinions if Google should be used in English class. The students' responses in the last interview question were revealed in Interview Question 5, which asked '*Do you think Google should be used in English class? Why or why not?*'. The verbal data obtained from this interview questions illustrated similar opinions among the students. Eight out of ten students affirmed that Google search should be used in English classroom. It facilitated the students in learning to use search engines in learning language, and it was very convenient for them when searching for words, sample sentences, pictures, language learning websites, and etc. Furthermore, they perceived that Google search helped them check collocations from real language use and learn to know collocations better. Google search also provided websites for the students to access language learning resources such as collocation learning websites or collocation online dictionaries. Therefore, the students not only learned from books, but they also learned autonomously by using technology.

VII. DISCUSSION AND CONCLUSION

The effectiveness of GALL based on DDL

As the findings of the present study were revealed the effects of using GALL to improve students' collocation use in sentence-level writing, Google-assisted language

learning (GALL) based on Data-driven learning (DDL) to the use of Google search as a matching concordancer can be a productive resource of real language uses and patterns in order to help students improve their collocation use in sentences, and help them learn verb-noun collocation through practice on writing exercises (e.g. Guo & Zhang, 2007; Chinnery, 2008; Conroy, 2010).

Firstly, the effects of GALL helps students improve verb-noun collocation use in their sentences. As it was found from the students' test score results, most of students had better scores after they obtained the treatment of using GALL, and they also produced some verb-noun collocations better and more accurately. The students' improvement would be from when the students were involved in the training, they had a chance to use Google search to check and correct spelling or collocation errors. In this way, they were able to use correct pairs of collocations in their written works and their spelling improved (Chinnery, 2008). With some GALL techniques, the students have learned to regain words or phrases from Google and integrate them into their own writing (Fujii, 2007). This beneficial aspect of GALL can be appropriate for DDL activities which provides the students with evidence of real language use in the forms of lexical and grammatical patterns that help students learn from the real language use on their own (Yoon, 2014). Also, in DDL, the students are motivated to use Google search as a tool for finding solutions to real problems which are directly connected to their needs (Watson Todd, 2001). The findings of the current study is in line with Fujii (2007) which found that the use of GALL helped students perform better in their writing in several areas, such as the use of articles, singular/plural differences, collocations, and verb tenses. Therefore, the way the students use new collocations in their sentence writing help them develop their writing abilities, and it can also be a challenge for second and foreign language learners (Nation, 2001).

Secondly, the effects of GALL helps students learn verb-noun collocations through practice. This positive results of using GALL would be from the practice process that the students have a chance to use Google search and collocation dictionary online as language learning assistance tools when revising their writing to find typical language uses or patterns used for specific situations, and to evaluate how accomplished they would be on searching for information they need from Google search without a teacher's help (Kennedy & Miceli, 2001). Additionally, similar to Bloch (2007), the process of practicing DDL activities helps the students explore many samples of the target language from corpora or concordances so that they are able to discover patterns and rules on their own inductively instead of being deductively taught. The finding of the present study also conforms to Rüschoff

(2003) that the students' cognitive abilities are enhanced and extended with a cognitive tool (Google search) and DDL approach. The students are encouraged to draw on existing knowledge and practice through techniques to their collocation learning. Also, they take the role of investigators when working with the abundance of data provided by the Web to get immediate language support and help them learn the target language (e.g. Chinnery, 2009; Conroy, 2010; Shei, 2010). The process of using GALL therefore provided opportunities for the students to learn collocations through the practice and helped them better acquire the language (Lewis, 2000).

Students' positive perceptions on the use of GALL

The students' perceptions from interview demonstrated that using GALL could help them improve their collocation use in their sentence writing. The findings revealed that they considered the benefits and the importance of collocations to English language learning. As Google search is easy to use as it requires uncomplicated query linguistics, the students are already familiar with it for their information searches and may already have developed their own strategies for productive searches (Lee & Swales, 2006). The finding is in line with Park (2010) that many students already used GALL techniques and Google search for language learning and writing support, and they preferred to use Google search due to it was a quick search to the whole Web which returned a great number of hits for word sequences specific to their field, and it was likely to be familiar to the students. Also, similar to Conroy (2010), the students were surveyed on their uses of GALL and attitudes towards Google tools before and after the training and practice. The majority of the students showed positive attitudes toward GALL and concordancing for language learning and writing support. Particularly, many students had already been using Google as a reference tool even before the training. Their primary search techniques were very simple and mostly intended for content searches. Specific search techniques and strategies therefore needed to use Google search as an assisted language learning tool in the training which were innovative to the students and perceived as very useful in supporting their academic writing (Sha, 2010).

Implications of GALL for teaching English collocation and for further studies

As such, the new way of using GALL can be compiled in the benefits for the language learning purposes, especially language learning in Thailand. Teachers can incorporate GALL in English language classrooms with a focus on English collocation competency. The teachers should be well-trained with essential methodology to employ the GALL and DDL approach in order to assess students, design materials, and develop instruction (Bloch, 2007). Thai teachers who teach English should play the role of facilitator. The teachers themselves

should have knowledge in corpora, concordances, and other useful reference resources such as Google search or Weblog. Also, English collocation teaching materials designed and developed according to GALL should be incorporated into foreign language classrooms. Google based language learning materials and activities are therefore passed to students through learning management systems (Zengin, 2009). However, based on the findings, language teachers or other scholars who are interested in GALL should conduct further studies with using GALL in teaching collocation in various types and more samples of collocations as well as types of most collocation errors and should try out with larger sample size of Thai students in other levels such as high school or university students.

Based on the findings of this study, because some collocations found in Google search might be used by non-native or English native speakers, the students should have a chance to gain exposure on using concordances or corpora such as COCA or BNC. This can be helpful for students to learn and check the correct use of collocation from real language use. Moreover, when using GALL as a language learning tool for a writing task, Google search may be considered as problem-solving tool to help the students to complete their tasks efficiently (Chinnery, 2008). The students should be encouraged to realize that GALL used for problem solving into language development enhances their knowledge of collocation and improves language use (Wu, Franken, & Witten, 2009). Additionally, in DDL classroom, GALL can be appropriated with the constructivist principles of language learning as it helps language learners develop cognitive and metacognitive skills and facilitates their autonomous learning (Boulton, 2010a). Therefore, the students should be provided with training in the use of GALL and concordance techniques as a way to independently monitor and improve their language use with longer durations of the practice. Their collocation use in writing beyond the sentence-level could be suggested for further studies.

Conclusion

The use of GALL has a positive effect on sixth-grade students' collocation use in their sentence writing and positively impacts their perceptions toward using GALL to improve their verb-noun collocation use. Using GALL via DDL facilitates students to acknowledge the accurate use of collocation in their writing. By applying this approach to improve the students' collocation use, the students were trained to use Google search in searching and checking the correct use of collocations, practiced on using verb-noun collocations in writing exercises, and learned to notice how both native English and non-native English speakers use verb-noun collocations. The students had a chance to learn and use collocations accurately and fluently as native English speakers do.

Therefore, teaching collocation in English class should be emphasized especially in Thai schools. Also, the development should be made to GALL to effectively facilitate students in learning collocations with the applied use of technology and internet in their language learning. It should be adjusted to the appropriateness of the students' English proficiency level and to use with additional corpora or concordancers in order to help improve Thai students' collocation use.

ACKNOWLEDGMENT

The author would like to express grateful and sincerest gratitude to the advisor and Graduate School of Khon Kaen University for the scholarship.

REFERENCES

- [1] Bahns, J. & M. Eldaw, (1993). Should we teach EFL students collocations? *Systems*, 21 (1), 101-114.
- [2] Bloch, J. (2007). *Technologies in the second language composition classroom*. Ann Arbor, MI: University of Michigan Press.
- [3] Boulton, A. (2010a). Data-driven learning: The perpetual enigma. In: Harris, T. & Moreno Jaen, M. (eds.) (2010). *Corpus linguistics in language teaching*. Bern: Peter Lang. 17-52.
- [4] Chinnery, G. M. (2008). You've got some GALL: Google assisted language learning. *Language Learning & Technology*, 12 (1), 3-11.
- [5] Conroy, M. A. (2010). Internet tools for language learning: University students taking control of their writing. *Australasian Journal of Educational Technology*, 26 (6), 861-882.
- [6] Durrant, P., & Schmitt, N. (2009). To what extent do native and non-native writers make use of collocations? *International review of applied linguistics*, 47 (2), 157-177.
- [7] Flowerdew, L. (2005). An integration of corpus-based and genre-based approaches to text analysis in EAP/ESP: countering criticisms against corpus-based methodologies. *English for Specific Purposes*, 24 (3), 321-332.
- [8] Fujii, Y. (2007). Making the most of search engines for Japanese to English translation: Benefits and challenges. *The Asian EFL Journal Professional Teaching Articles*, 23, 1-36.
- [9] Grant, (2005). *Procedure of scoring writing samples*. University of Minnesota.
- [10] Guo, S., & Zhang, G. (2007). Building a customized Google-based collocation collection to enhance language learning. *British Journal of Educational Technology*, 38 (4), 747-750.
- [11] Hamad, M. (2013). Effects of using online dictionary and intensive involvement tasks in developing EFL learners' receptive and productive knowledge of verb-noun collocations. Master thesis in Master of Art in teaching English as an international language. Songkla: Prince of Songkla University.
- [12] Harwood, W. S., & McMahon, M. M. (1997). Effects of integrated video media on student achievement and attitudes in high school chemistry. *Journal of Research in Science Teaching*, 34(6), 617-631.
- [13] Hill, J. (2000). Revising priorities: From grammatical failure to collocational success. In Micheal Lewis (Ed.), *Teaching collocation* (pp.47-67). Hove, England: Language Teaching Publications.
- [14] Hou, Q. & Pramoolsook, I. (2012). Non-English Major EFL Learners' Lexical Collocation Errors in a Chinese Context. *Suranaree journal of social science*. 16 (1), 1-16.
- [15] Howarth, P. (1998). The phraseology of learners' academic writing. In: Cowie, A.P. (Ed.), *Phraseology*. Clarendon Press, Oxford, 161-186.
- [16] Johns, T. (1986). 'Micro-Concord: a language learner's research tool.' *Systems*, 14 (2), 151 -162.
- [17] Johns, T. (2002). Data-driven learning: The perpetual challenge. In B. Kettemann & G. Marko (Eds.), *Teaching and learning by doing corpus analysis* (pp. 107- 117).
- [18] Kennedy, C., & Miceli, T. (2010). Corpus-assisted creative writing: Introducing intermediate Italian learners to a corpus as a reference resource. *Language Learning & Technology*, 14(1), 28-44.
- [19] Laufer, B. (1994). The lexical profile of second language writing: does it change over time? *RELC Journal*, 25 (2), 21-33.
- [20] Laufer, B. & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 writing production. *Applied Linguistics*, 16 (3), 307-322.
- [21] Lee, D., & Swales, J. (2006). A corpus-based EAP course for NNS doctoral students: Moving from available specialized corpora to self-compiled corpora. *English for Specific Purposes*, 25, 56-75.
- [22] Lee, C. Y., & Liou, H. C. (2003). A study of using web concordancing for English vocabulary learning in a Taiwanese high school context. *English teaching and learning*, 27(3), 35-56.
- [23] Lewis, M. (1997). *Implementing the lexical approach: putting theory into practice*. London: English teaching Publications.
- [24] Lin, Y. P. (2002). The effects of collocation instruction on English vocabulary development of junior high school students in Taiwan. *National Kaohsiung Normal University, Kaohsiung, Taiwan*.
- [25] Namvar, F, Nor, N. F. M, Ibrahim, N, & Mustafa, J. (2012). Analysis of collocations in the Iranian postgraduate students' writings. 3L: *Language, Linguistics, Literature. The Southeast Asian Journal of English Language Studies*, 18 (1), 11-22.
- [26] Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.
- [27] Nattinger, J. R. & DeCarrico, J. S. (1992). *Lexical phrase and language teaching*. Oxford: Oxford University Press.
- [28] Nesselhauf, N. (2003). The use of collocations by advanced learners of English and some implications for teaching. *Applied Linguistics*, 24 (2), 223-42.
- [29] Nesselhauf, N. (2005). *Collocations in a Learner Corpus*. John Benjamins Publishing Company, Amsterdam/Philadelphia.
- [30] Park, K. (2010). Enhancing lexicogrammatical performance through corpus-based mediation in L2 academic writing instruction. Unpublished doctoral dissertation, The Pennsylvania State University, University Park, PA.
- [31] Robinson, P. (1997). Generalizability and automaticity of second language learning under implicit, incidental, enhanced, and instructed conditions. *Studies in second language acquisition*, 19, 223-47.
- [32] Rüschoff, B. (2003). New technologies and language learning: Theoretical considerations and

- practical solutions. Retrieved July 15, 2011, from http://www.ellinogermaniki.gr/ep/geh-mit/htm/New_Technologies_and_Language_Learning.doc
- [33] Sha, G. (2010). 'Using Google as a super corpus to drive written language learning: A comparison with the British National Corpus'. *Computer Assisted Language Learning*, 23 (5). 377-393.
 - [34] Shei, C. (2008). Discovering the hidden treasure on the Internet: using Google to uncover the veil of phraseology. *Computer Assisted Language Learning*, 21 (1), 67-85.
 - [35] Sinclair, J. M. (1991). *Corpus, concordance, collocation*. Oxford University Press, Oxford.
 - [36] Tseng, F. P. (2002). A study of the effects of collocation instruction on the collocational competence of junior high school students in Taiwan. Unpublished master thesis, National Taiwan Normal University, Taiwan.
 - [37] Usen, A. (2015). Effectiveness of teaching collocations to primary school students (grade 6). Master thesis in teaching English as an international language. Faculty of Liberal Art, Prince of Songkla University, Thailand.
 - [38] Wasuntarasophit, S. (2015). Explicit instruction of collocation: An impact on learners' use and opinions. *Journal of Humanities and Social Sciences*. 11(2), 21-56.
 - [39] Watson Todd, R. (2001). Induction from self-selected concordances and self-correction. *System*, 29 (1), 91-102.
 - [40] Wray, A. (2002). *Formulaic language and the lexicon*. Cambridge University Press, Cambridge.
 - [41] Wu, S., Franken, M., & Witten, I. H. (2009). Refining the use of web (web search) as a language teaching and learning resource. *Computer assisted language learning*, 22 (3), 249-268.
 - [42] Yoon, H., & Hirvela, A. (2004). ESL student attitudes toward corpus use in L2 writing. *Journal of Second Language Writing*, 13 (4), 257-283.
 - [43] Zengin, B. (2009). Benefit of Google search engine in learning and teaching collocations. *Egitim Arastirmalari-Eurasian Journal of Education Research*, 34, 151-166.
 - [44] Zhen, F. C. (2005). Corpus-based data-driven foreign language learning: ideas, methods and techniques. *Foreign Language World*, 4, 19-27

Enhancing the Motivation of Low-motivated Thai EFL Learners through Self-imaging Activities

Kanokwan Wongthong, Chomraj Patanasorn

Faculty of Humanities and Social Sciences

Khon Kaen University

Khon Kaen, Thailand

wongthongk@yahoo.com

ABSTRACT

Over a few decades, motivation has been one of the key areas in second language research. Dörnyei (2009) proposed L2 Motivational Self System (L2MSS), related to the relationship between motivation and the self-concepts. Several studies were conducted to prove it, but there are a few experimental studies adopted this concept to develop classroom activities.

The study set off to investigate to what extent self-imaging activities affects the motivation of low-motivated Thai English as a foreign language (EFL) learners. Self-imaging activities were developed as the treatment with an aim of enhancing the motivation of the EFL learners. The participants were 60 low-motivated EFL learners, equally divided into experimental and control groups. They were asked to answer a pre-post 6-point Likert motivation questionnaire, but only the experimental group was provided 10 self-imaging activities. A dependent and an independent t-test were conducted to compare the mean scores, the level of motivation obtained from the pre-post motivation questionnaire within and between groups. In addition, the participants' behaviors were scored and then converted through percentage to examine the motivational behaviors resulted from the treatment.

The study revealed that after the self-imaging activities, the motivation of the experimental group was higher than before the activities and higher than the control group. This was consistent with the motivational behaviors. This study shed light on the development of classroom activities related to self-images to promote the motivation in learning English.

Keywords: Motivation, Second language motivation, Thai EFL, Self-image, Self-imaging activities, L2 Motivational Self System

I. INTRODUCTION

As there has been an attempt to succeed in English in a more interconnected and globalized period, English is taught and spoken as a second and foreign language worldwide. The teaching and learning of English as a second language (ESL), as an international language (EIL) and as a foreign language (EFL) has increased in a number of countries. To be successful in English language learning, several factors play an important role. Apart from instructions, learners and environments, the affective filter is another main factor that influences second language learning (SLL) and acquisition (SLA). According to Krashen [1], the affective filter which includes motivation, attitude, anxiety and self-confidence creates mental blocks which impede a path to achievement with language learning and acquisition. Motivation is considered one of the most important factors among the four factors of the affective filter that influences SLL and SLA.

II. MOTIVATION

In socio-psychological dimensions, language learning motivation is explained by Gardner and Lambert [2] as consisting of both *integrative orientation*, indicating personal and real feelings of interest in the target language

and its community and *instrumental orientations*, relating to advantages of learning the target language. Gardner [3] claims that, for decades, the theory in L2 motivation research has been the concept of the *integrativeness* constituent. This means that, although an individual's motivation to learn L2 is instrumental, there is always willingness or satisfaction to associate with its community. Therefore, integrativeness plays an important role in this line. When the notion of *World Englishes*, explained by Kachru [4], was spread out such as English as a global language or English as a lingua franca, many scholars questioned the categorization of English communities that language learners would prefer to be in. Obviously, there is no exact reference community as there are many English language communities throughout the world. Ushioda [5] states that as English is the global community, it would be a good idea to generalize and conceptualize it as the external reference group or the internal substitution of an individual as a member of that community. This results in the reconceptualization in which the focus shifts from an external reference group to an area of self and identity. Dörnyei and Csizér [6] and Dörnyei, Csizér and Németh [7] found in their study that, as the identification process is associated with integration, it might be better described as an internal process of self-identification of an individual. Based on the findings mentioned earlier, the *L2 Motivational Self System* has

been reconceptualized by Dörnyei [8] employing the *Possible Selves* of Markus and Nurius [9] and *Discrepancy Theory* of Higgins [10].

The possible selves concept involves the link between humans' self and their actions, including "what humans *might* become or *ideal selves*, what they *would like* become or *default* options and what they are *afraid of* becoming or *feared selves*." These ideas are related to how people form unrealized capability in themselves, what they want to happen, what they desire to have and what they imagine to have or to do. As the ideas are more referenced to the future than the present conditions of self, the possible selves act as *future self-guides* which explain the range to which a person is moved from the present to the future. *Ought selves* is the other term also mentioned. It is referred to as the self that an individual perceives as how other people view him or her. One important notion is that *possible selves* are emphasized to represent clear images and senses. That is, they entail the way people see and view themselves at present or future even if they are not sure about what is going to happen.

Higgins [10] hypothesizes that humans' behaviors are controlled by an attempt to balance the needs for a *promotion focus* where we might be able to expect advantages and pleasant feelings from an action, and a *prevention focus* where, in contrast, we might be able to receive disadvantages and unpleasant feelings from the same action. He also underlines that a promotion focus has to do with ideal self or the self that an individual would like to be, and more intrinsic motivation. However, a prevention focus concerns with an *ought-to self* or the self that an individual thinks he should possess, and it involves values. Both selves are able to come from one's own or other surrounding people's views. This means an ideal self might represent characteristics other people would like an individual to be or to have.

A. Motivational Concepts

Motivational concepts involve techniques that promote the individual's goal-related behavior. In order to promote human behavior, which is complicated to some extent, various concepts have been proposed from time to time. Motivational concepts, thereby, influence an achievement of some systematic and long-lasting positive effects. It is the fact that a large number of the motivational concepts are aimed to facilitate classrooms of L2 learning. It results in applicable frameworks.

Originated by Dörnyei and Ottó [11], a *process model of language learning motivation* was firstly developed with the aim of seeking to account for the constant change of motivation. It is also to prolong language learning activities. There are three stages of the process model of language learning which include pre-actional, actional, and post-actional stages. At the first stage, motivation is generated as it contributes to the selection of a goal or task

to be carried out. The second stage or executive motivation needs to energetically maintain and protect the generated motivation from the first stage. The last stage of this framework is motivational retrospection which retrospectively evaluates learners about how things were going in their processes of past experiences. This retrospection can even help determine future activities being administered in class. In summary, as a part of the present research, the framework of a process model of language learning motivation has been selected as a blueprint to follow during classroom observation. Another important factor that could not go unmentioned was the integrated activities, which were self-imagining activities. These activities were used in the classroom. However, before discussing the self-imagining section, it is necessary to go through the L2 Motivational Self System as the association to self-imagining.

B. L2 Motivational Self System

Proposed by Dörnyei [8], the L2 Motivational Self System is a shift in focus on L2 motivation research. The concept is composed of three environment-related components: ideal L2 self, ought-to L2 self and L2 learning experience. The first and foremost component of the L2 Motivational Self System is *ideal L2 self* which is the L2 exact side of an individual's ideal self. It is an influential, internalized incentive for one to learn a second language. In addition, the ideal L2 self is the self that one would like to become. This is the component that assists in reducing the difference between one's actual and ideal selves. Secondly, *ought-to L2 self* is the priority that if people believe they ought to or should have the attributes to meet their wills, negative consequences will be avoided. This means that the ought-to self is the self that focuses on the wishes or desires of achieving their expectation. However, this component provides fewer internalized motives. The learning experience is the final component of L2 Motivational Self System, and it entails motives particularly existing in people. It is a sudden learning environment and experience such as the effects of curricula, teachers, peers and successful experiences. This relates to the fact that if the effects are more positive, the drive to learn the L2 will be more highly influential.

The tripartite construction of the L2 Motivational Self System seems to be a positive and helpful stimulus. Consequently, it is essential to enhance the L2 self so that it is more effective in second language learning. A great number of researchers (Berkovits [12]; Fezler [13]; Leuner, Horn, & Klessmann [14]; Singer [15]) in several areas, such as psychology, education and sport proposed that self-images have the potential to strengthen the L2 self. The SLA field, therefore, adopted the self-imagining concept to promote the learning process of L2 learners. Therefore, it is vital to clearly understand the term self-image, as it is an important addition administered to the

procedures of the present study. As a consequence, the last section of this literature review provides the concerns of self-image thoroughly.

As mentioned earlier, the L2 Motivational Self System is a framework related to language learning motivation and vision that can lead to success. This means that if a person has a strong ability to imagine a mental image of his or her English learning context, he or she will be kept on track towards that goal. Language learning can be compared with the trainings of professional athletes, in many aspects. It is clear in the literature that successful sports players are often motivated by imagery and vision. From three constituents of L2MSS, *Ideal L2 Self* is a powerful stimulant if the learner has a demanding and vivid future self-image which agrees with surrounding people, such as peers and family, and is able to stimulate the learner's self-concept. Also, the *Ideal L2 Self* must be composed of effective procedural strategies which work as a strategic plan to achieve the goal and detailed information about not achieving the desired goal. According to these characteristics, six strategic implications are used as guidelines to supply motivation to learners.

Firstly, to construct the ideal L2 self is to create the vision. This step can be done by adding significance to ideal selves in order to guide learners through several possible selves that have made them happy in the past. Powerful role models should be presented to them in order to help them clearly see their images and to be able to outline their ideal future lives. Secondly, it is important to remember that only having self-image is not enough. The vision should be strengthened like athletes train in order to make it exist. This can be done by using images and letting them consider their future successful images. Another point is to make the *Ideal L2 Self* possible by substantiating the vision. This is to allow the learners to perceive their images as a possibility. Diagrams such as the Possible Selves Tree, may be used. Moreover, when it is possible to have such imagery, keeping the vision alive or activating the *Ideal L2 Self* is another necessary part in order to move on. Therefore, inviting a role model to classroom may be a good decision. When the learners have the exact images, the vision should be operationalized by developing an action plan. This can make language learning more effective because when the learners have the *Ideal L2 Self*-images, it can be useful to also have a plan in order to keep them on track. Trying to counterbalance the vision is the last step. It provides space for the learners to consider the failures that might happen at last.

C. Self-image

The mental picture of an individual or self-image is the motivating force inside that individual's action moving according to the image in his or her mind, stated

by McMahon [16]. Self-images are created when people visualize themselves at present and in the future (possible selves). In reference to Markus and Nurius [9], the *possible selves* concept provides ways of expressing thoughts to harness the powerful motivational function of imagination. Markus [17] also stated that imaginative work has powerful consequences resulting from people spending much time envisioning their futures related to what they might or would like to become, and to what they are afraid of becoming. This means the possible selves plays an important role in energizing an individual's action. If a person has a dream and tries to sustain it by imagining to his or her future image, the dream can come true, according to Markus [17] and Wenger [18]. In addition, Boyatzis and Akrivou [19] stated that humans have been driven by imagination and the ability to visualize desired future images. For example, in many occupations, people must be inspired, keep inspired and also make other people inspired through the images which will become the motivation to move towards these future images. The self-image has also been applied to athletics in order to develop the image of success in Olympic athletes. This has to be practiced regularly until the image is mentally attached.

There is a belief that a language is not only a communication code, but it can be learned and trained as other subjects can. Therefore, the emergence of the L2 Motivational Self System takes the self-concepts into the language learning line. Self-imagery about L2 should be developed and enhanced so that it reflects the motivation to learn the target language. Throughout decades, many scholars have been validating the relationship between the self-image and other variables in language learning.

In Thailand, a monolingual country, there is only English regarded as a second language, according to Wiriyachitra [20]. The introduction of English in learners' related daily life is always emphasized. Nevertheless, the distance and the lack of natural practice in L2 can cause some effects on language skills development. This affects the acquisition in the language and finally results in ignorance of the importance of English and low-motivation in learning the language. Accordingly, enhancing learners' motivation by providing future self-guides that can induce vivid self-images could be an effective motivating tool as the most important point of the study has the purpose of helping learners learn English and step forward with their goals. However, only a few experimental studies have been conducted by using L2MSS to develop classroom activities. Consequently, in this study, a future self-guide was implemented with low-motivated EFL learners.

This study examined the role of motivation of Thai EFL learners before, during and after providing self-imagining activities. The study was conducted in EFL

classrooms during actional stage at Khon Kaen University, Thailand. The population in this study were non-English major EFL learners who re-enrolled in English for Communications subject conducted by Khon Kaen University Language Institute. The study took place during semester 2 of the academic year 2016. This was to see whether the learners' motivation could be changed when the future self-guides were stimulated and whether it helped them possess a more vivid self-image. In order to generate the ideal self-image, self-imaging activities were developed with the purpose of integrating them into the classrooms.

The objective of this study was to investigate the effect of self-imaging activities on the motivation of low-motivated EFL learners at Khon Kaen University, and this objective was sought to find the answers to the research question: To what extent do self-imaging activities affect the motivation of low-motivated EFL learners at Khon Kaen University? Two hypotheses were also raised as follows: 1) After participating in self-imaging activities, the level of motivation in learning English of the experimental group is higher than before participating in self-imaging activities and 2) After participating in self-imaging activities, the level of motivation in learning English of the experimental group is higher than the control group.

III. METHODS

A. Participants

There were 60 participants in this study, and they were separated into the experimental group and the control group, with 30 participants each. These individuals were all considered approximately low-motivated individuals as measured by 6-point Likert scale pre-motivation questionnaire. The questionnaire items were scored using these scales: 6 or strongly agree, 5 or agree, 4 or slightly agree, 3 or slightly disagree, 2 or disagree, and 1 or strongly disagree. Quasi-experimental pretest and posttest with control group design was adopted from Campbell and Stanley's [21] design. In this study, the participants were not randomly sampled. They were in classes in the university and shared similar characteristics, and they were selected by convenience sampling.

The researcher ordered the criteria to evaluate the level of motivation. The learners with the average scores around 1 to 3 were considered as low-motivated English learners. Similarly, those who with the average scores around 3 but less than 4 to 4.2 were considered as somewhat low-motivated English learners. If the average score was 4.2, the motivation tended to be high. However, this score reflected that there were a lot of items were scored 3 and less than 3. Therefore, the researcher suggested that the learners who are evaluated at the average score of 4.2 or less still remained fairly low-motivated.

This study was operationally conducted in order to compare the level of motivation to learn English, future self-images and motivational behaviors of the learners. The participants in both groups answered the pre- and post- motivation questionnaire so that the researcher was able to track their motivation changes after the treatment provision sessions. In addition, the experimental group was given treatment inside and outside the classroom for 5 weeks, while the control group was not provided any treatment. During the treatment provision, their motivational behaviors were observed in classroom by the researcher using a motivational checklist adapted from learners' behaviors part of classroom observation scheme of Motivational Orientation of Language Teaching (MOLT) developed by Guilloteaux and Dörnyei [22]. A video recorder was also used in the classroom, so that it was helpful for the researcher and the interrater to label and recheck learners' behaviors afterwards.

B. Instruments and procedures

• A Motivation Questionnaire

A motivation questionnaire consists of 36 items to survey learners' motivation before and after receiving self-imaging treatment. The questionnaire items includes the following 5 aspects: *intrinsic motivation, extrinsic motivation, self-efficacy, attitudes toward learning English and L2 anxiety*. The questionnaire items were adapted from Dörnyei and Taguchi's [23] and Ueki and Takeuchi's [24]. All selected aspects could refer partly to the motivation before and after receiving the treatment. The motivation questionnaire was found to be highly reliable ($\alpha = 0.85$). The 6-point Likert scale, ranging from 6 (strongly agree) to 1 (strongly disagree), was used in order to avoid noncommittal answers that were plainly selected 'neutral' [25]. In addition, the researcher sought to find a way for the participants to express their exact opinions on each item. This meant the respondents had to say something positive or negative. However, it was unavoidable that there were some respondents whose opinions were neutral, so the researcher added an open-ended question which was about *opinions the participants would like to express about learning English* in order to gain many more extended opinions.

Listed below are the perspectives that the questionnaire purported to measure.

a) Intrinsic Motivation

This concept was composed of 6 items (item 1-6) which were related to the extent the learners were motivated inside themselves.

b) *Extrinsic Motivation*

This concept was composed of 9 (item 12-20) items which were related to the extent the learners were motivated, outside themselves.

c) *Self-efficacy*

The self-efficacy aspect consisted of 5 items (item 7-11). This concept referred to how a person believed in his or her abilities to complete a task, stated by Bandura [26]. Self-efficacy was considered as a variable affecting an individual's behaviors. This seemed to be powerful, because if a person believed he or she was able to do a particular thing, it could be a motive driving him or her to achieve the goal. That was why self-belief mattered in representing how motivated a person was.

d) *Attitudes toward Learning English*

This aspect was concerned with learners' attitudes towards English learning environments that they might directly experience themselves or be influenced from by people around them such as peers, family members and teachers. Ten survey items (item 21-30) were included.

e) *L2 Anxiety*

Anxiety was a negative variable influencing learners' success in learning a foreign language. It related experiences learners have experienced in L2 communication and learning. The 6 items (item 31-36) were related to L2 anxiety levels the learners have encountered in L2 situations.

As mentioned above, the 5 aspects were to represent the motivation of the learners before and after the treatment. The results of the motivation questionnaire were presented in tables.

- *An Observation Checklist*

An observation checklist includes lists of behaviors indicating an increase in motivation. It assisted the researcher in collecting and recording the behaviors of learners during classes. Because student behaviors were resulted from motivation, the motivation orientation of language teaching (MOLT) classroom observation scheme conducted by Guilloteaux and Dörnyei [22] was adopted, with a special attention to the *learners' motivational behavior*. This scheme was adopted because it covered the assessment of the level of the learners' motivated behavior through three variables: *alertness*, *participation*, and *volunteering* during activities in classroom. Three-level scales were used to measure *alertness* and *participation* as follows: *very low* indicated a few learners, *low* indicated one to two thirds of the learners, and *high* indicated more than two thirds of the learners. However, only *high* was counted as motivated. The term *alertness* here refers to actions of showing

attention to what was going on during class, such as careful listening to and looking at the teacher, and not showing ignorance (e.g., using the phone, talking to others, or sleeping). Three-level scales of different ways of *volunteering* measured how much the learners were willing to volunteer. Only the one third of the learners who volunteered without any persuasion from the teacher was considered voluntary. Behaviors considered to be unmotivated ones other than the three variables were also recorded. The results of the behavior scores were presented in a line graph.

To prove reliability of scoring the observation checklist, interrater reliability was to measure the degree of agreement of obtained scores. In this study, there were two raters: a teacher assistant and a research assistant, percentage agreement method was employed. It was found that the raters achieved 80 percent in agreement, and this was considered acceptable in social sciences.

In addition, to reduce mistakes during checking learners' behaviors and to avoid classroom interruptions, video recording was used for behavior observation. A camcorder was placed in the classroom since the first time the researcher met the learners in classroom so that learners would feel comfortable with it, but the learners were not recorded until later in the research. The observation list checking began in week two. The observation checklist was scored and reported through percentage, showing evidence of how learners' motivation changed during the classes.

C. *Treatment*

The treatment of this study was self-imaging activities. The researcher used different types of self-imaging activities because the same format of activity might be tedious in reference to the pilot study in which the researcher only used role models' presentations. Five types of self-imaging activities were produced and gathered based on an identical objective which was expected to promote future self-image and link to motivation through behaviors. According to the concept L2MSS, there were six strategic implications guiding steps to promote self-image. Consequently, the researcher employed this guideline to construct and complied the self-imaging activities which were used as the treatment in this study. As mentioned in the introduction of the instruments, there were reflections of the research assistants given to validate the effectiveness of the self-imaging activities.

Self-imaging activities were provided to the participants inside and outside the classroom during 5 weeks in the second semester of the 2016 academic year. All classes were conducted by teachers of Khon Kaen University Language Institute. Each week consisted of two 1.5-hour classes, but each treatment provision session took about 30 minutes inside and outside the classroom as conducted by the researcher. All self-imaging activities

were to help the participants realize their present images and see their future self-images or mental pictures in which they saw themselves use English in any situations in the future. This was expected to lead the motivation in learning English. To assist the participants to visualize their future self-image effectively, these activities were provided regularly before each lesson started. Accordingly, the 5 types of self-imaging activities integrated to assist the participants to see their future self-images were 1) poster creation, 2) whiteboard animations, 3) inspirational videos, 4) role models' short interviews and 5) role model talks. Some types of the activities were administered to the class more than once. To be more understandable, the explanations of each are provided respectively.

- *Poster Creation*

Regarding poster creation activity, the learners were directed to create their posters one by one while sitting in small groups. The posters were to help learners get to know themselves in terms of their levels, aims and motivation to learn English. In addition, doing this activity in the small groups allowed them to be able to see a variety of ideas from their classmates. There were 3 phases of poster creation activity. First, in the initial class meeting, the researcher told learners to get into groups of three or four. The learners were asked to discuss their English language learning behaviors, attitudes, motivation, gains and aims. Next, they transferred their thoughts to a piece of paper and pinned it up on the classroom wall. This provided an opportunity for the learners to illustrate their own current images in learning English. The learners' goal was to be able to represent their future self-images. This activity was expected to take around 20 minutes. The researcher expected to see the learners understand themselves more, and this activity provided an incentive that encouraged them to want to see their future vivid images afterwards. Finally, the reason why having the learners attach their posters on the wall was so that the learners could see their images every time they came to class. In other words, the poster could remind the learners about their goals. In addition, the more often they saw their images, the more motivated they were. The researcher expected that this activity would be able to help promote learners' motivation to learn English a little more. The first day's activity was completed. To sum up, setting goals and then displaying the goals reminded the goal-setters about understanding themselves.

- *Whiteboard Animation*

A whiteboard animation video is a video which draws and narrates itself at the same time. It is widely popular among channels nowadays. A video clip can be animated using images, shapes, lines, characters, sounds and voiceovers. In terms of education, this type of video

has been widely used, and it can capture the learners' or viewers' attention as messages and pictures keep changing almost every second. In this study, a whiteboard animation video was produced to illustrate positive ways or advantages of knowing English in general, and of an undergraduate student who once disliked or even hated English but later changed his thoughts (a make-up situation). This video included pictures of the boy's life before and after having English as a part of his life. Charts, shapes, lines and characters presented the progress of how he saw his self-image. Next, the video also showed how his motivation changed during that time. Finally, the achievements showed how successful he was having English as a part of his life. This was the second activity taking place in the second class to strengthen learners' goals in learning English. A whiteboard animation was played at the beginning of the section, and it took about 5 minutes. The whiteboard animation motivated and helped the learners to see their future image of learning English language more clearly. After it ended, the teacher asked about the learners' goals again and let them add other goals in their posters created the last time if they wanted to. Another purpose of this activity was to sustain their motivation that might arise a little or a lot from the last time. After finishing watching the video, the researcher encouraged the learners before starting the lesson. During the class, learners' behaviors were recorded by the researcher and a video recorder in order not to miss even a single behavior. In conclusion, the video helped keep learners' eyes' focused on an ongoing change when being good at English. This activity might gradually knock down the wall of negative attitudes toward English and increase motivation to learn English.

- *Inspirational Videos*

Inspirational videos are videos that can give inspiration and motivation in doing something. The videos provide real motions and sounds which represent something that happened in reality. The inspirational videos used in this study were about the lives of different people who were able to use English. The videos showed people in different professions such as actors, singers, musicians, sport players, masseuses, motorcycle taxi riders, and so on. The people in the videos talked about how English was important to their lives and jobs. In addition, they had some words to encourage people to realize the importance of knowing and using English. The reason why the researcher chose to add this kind of video as the treatment was because most of the people in the videos were widely well-known, and it was interesting to see many people use English in different situations which might be applied to the learners' daily life. There were three different inspirational videos which were retrieved from TV programs' websites, and they were played in classes 3, 5 and 7. Each took about 10 minutes and was

played before the class started. After each video clip ended, the researcher asked a few follow-up questions to remind learners about what the people in the videos talked about, especially points about the importance of English. The learners were also asked to write down on a piece of paper to reflect on their feelings after watching the videos.

- *Role Models' Short Interview Videos*

Apart from seeing the inspirational videos, short interview videos of three role models were provided to the class. This activity resembled the previous kind of videos as it was about parts of life, experiences, ideas, tips, sayings and encouragement of people. However, the researcher wanted to make it more relevant to the learners, so four alumni of the university were found who once were in a similar situation as the participants regarding their attitudes towards English, English exam results, place and field of study, community and job opportunities. The previous inspirational videos might make the participants see something, but the alumni's short interviews might make it clearer. Four interview videos were used in this study. Each took about 3 to 5 minutes, and they were played before classes 4, 6, 8 and 9 started. At the end of each video, some follow-up questions were prepared to ask the learners, and the learners had to write about how they felt about learning English. This helped the learners to see the models' successes in learning English more clearly.

- *Role Model's Talk*

The researcher organized a small talk event as the last self-imaging activity. In this activity, a role model was invited to give a talk in class. The role model was also an alumnus of the university. However, entertainment and encouragement were the key factors because it might help reduce boredom and anxiety and make the learners feel comfortable during this activity. While listening to the talk, the learners were encouraged to ask questions about what they would like to know or anything they were interested in. At this point, the role model speaker and the learners were able to exchange experiences. This was the last activity in this study expected to assist learners in fading away the blockage and gaining more motivation to learn English. This activity could show the learners importance of knowing English. Although the speaker did not like English in the past, they could prove that it was never too late to start to learn English. Positive attitudes toward the English language and self-development were very essential. The talk was expected to last in 30 minutes in order to ensure that all of the learners not miss all information provided.

All in all, the self-imaging activities provided to the learners were purported to raise the learners' awareness of their present self-images and future ideal L2 self-images and to remind their ideal self-images. This might

lead to purported the reduction of the affective filter. For a clearer understanding of the treatment provision, the step-by-step process of providing the treatment is depicted in the following figure.

D. Analyses

- *t-test*

A dependent *t*-test was employed to compare the mean scores derived from the motivation questionnaire of the experimental group in order to draw a comparison between the pre- and the post- motivation of the group after the treatment. If the mean scores of the pre- and post-motivation within this group were different, the *p*-value was used to confirm the statistical acceptance. The reference of *p*-value in this study is less than or equal 0.05 or 95% confidence interval for the mean difference. This results gave the answer to the research question on the extent to which self-imaging activities affected the motivation of low-motivated EFL learners in Khon Kaen University and tested *hypothesis 1* whether the level of motivation in learning English of the experimental group is higher than before participating in self-imaging activities after participating in self-imaging activities. In addition, the pre- and post- motivation within the control group were compared if there were any differences. Moreover, independent *t*-test was also used to confirm whether there were any significant differences in the motivation posttest between the experimental and the control groups. This results helped test *hypothesis 2* whether the level of motivation in learning English of the experimental group is higher than the control group. In addition, it is considered statistically significant when the *p*-value is less than or equal 0.05 or 95% confidence interval for the mean difference.

- *Scoring*

There were two 1.5-hour classes conducted in a week, so it meant there were ten classes that the researcher participated in for learners' behavior observation. There were three main variables used to measure student's motivation behaviors in classroom which were alertness, participation and volunteering according to motivation behavior checklist adapted from MOLT. The total score of each variable was 60 for each week as there were 30 participants attending 2 classes in a week. When a participant showed each of behaviors listed in each class, that participant got 1 point for that motivation behavior in that class. It meant each participant could gain 2 points for each variable in each week in case he or she showed his or her motivation. The scores was finally calculated through percentage. This score purported to track the motivational behaviors in classroom regarding receiving self-imaging treatment. It could support the results of the motivation changes.

IV. FINDINGS

A. Effects of self-imaging activities on low-motivated EFL learners' motivation

The objective of the study was to investigate the effect of self-imaging activities on the motivation of low-motivated Thai EFL learners at Khon Kaen University. A dependent samples *t*-test was conducted to investigate to what extent self-imaging activities affect the motivation of low-motivated EFL learners at Khon Kaen University (*Research question*). The mean scores of the pre- and post- questionnaire of the experimental group were compared to examine the difference of the learners' motivation levels before and after the treatment during the actional phase in the classroom. The results of the comparison are illustrated in Table 1.

Table 1. A comparison of motivation levels within each group

| Group | Motivation | N | Mean | S.D. | t | p |
|--------------|------------|----|------|------|------|-------------------|
| Experimental | pre | 30 | 4.10 | 0.31 | 3.14 | 0.00 ^a |
| | post | 30 | 4.30 | 0.38 | | |
| Control | pre | 30 | 4.00 | 0.29 | 3.11 | 0.75 |
| | post | 30 | 4.02 | 0.37 | | |

a. Sig. $p < 0.05$

Table 1 shows that the mean score of the motivation level of the experimental group after being provided self-imaging activities ($M = 4.30$, $S.D. = 0.38$) was higher than before being provided the activities ($M = 4.10$, $S.D. = 0.31$); $t(29) = 3.14$, $p = 0.00$. This finding suggests that self-imaging activities affected the motivation of low-motivated EFL learners at Khon Kaen University by increasing motivation. Moreover, *hypothesis 1* was accepted ($p < 0.05$) due to the fact that after participating in the self-imaging activities, the experimental group demonstrated higher levels of motivation for learning English than before participating in the self-imaging activities. In contrast, the pre- ($M = 4.00$, $S.D. = 0.29$) and post- ($M = 4.02$, $S.D. = 0.37$) motivation results of the control group were not significantly different ($t(29) = 3.11$, $p = 0.75$.) According to this study, this can be interpreted that without the self-imaging activities, motivation in learning English did not increase. In brief, providing the self-imaging treatment through classroom activities can significantly increase motivation in learning English.

Apart from comparing the pre- and post- motivation differences within each group, an independent *t*-test was also conducted to test *hypothesis 2* of whether the motivation level in learning English of the experimental group after being given self-imaging activities was higher than the control group. Consequently, the pre- motivation levels and the post- motivation levels between groups were compared. The comparisons are demonstrated in Table 2.

Table 2. A comparison of the pre- and post-motivation between the two groups

| Motivation | Group | N | Mean | S.D. | t | p |
|------------|--------------|----|------|------|------|-------------------|
| Pre | Experimental | 30 | 4.10 | 0.31 | 1.21 | 0.23 |
| | Control | 30 | 4.00 | 0.29 | | |
| Post | Experimental | 30 | 4.30 | 0.38 | 2.84 | 0.01 ^a |
| | Control | 30 | 4.02 | 0.37 | | |

a. Sig. $p < .05$

It can be seen in Table 2 that there was no significant difference in the pre-test mean scores between the two groups ($t(58) = 1.21$, $p = 0.230$). This can be interpreted that the pre- motivation of the participants in both groups was the same. On the other hand, when comparing the post motivation scores between both groups, there was a significant difference between the post motivation level of the experimental group ($M = 4.30$, $S.D. = 0.38$) and the post motivation level of the control group ($M = 4.02$, $S.D. = 0.37$); $t(58) = 2.84$, $p = 0.01$. It can be concluded that the post motivation level of the experimental group was higher than the control group. Thus, *hypothesis 2* of this study was accepted ($p < 0.05$). In conclusion, the motivation level of the learners with self-imaging activities was higher than the motivation level of the learners without self-imaging activities.

As the motivation also reflected behaviors, the learners' behavior observation sessions in classroom of the experimental group were conducted to gain more evidence of motivation change to support *research question 1*. Figure 1 below shows the extent to which the motivational behaviors of learners occurred in the classroom each week. The motivational behavior scores of the experimental group's motivational behaviors were converted to percentages and presented in reference to MOLT.

According to the measurement scales of the observation checklist adapted from MOLT, if only a few of the learners show participation or alertness, they are counted as very low-motivated. If one third or around 33 percent of the class showed participation or alertness, it means low-motivated. Furthermore, the class is considered high-motivated if there were more than two thirds or approximately 66.67 percent of the class show participation or alertness. For the last variable, volunteering, the learners are considered motivated only if at least one third or 33 percent of the class is eager to volunteer in class. In contrast, if the teacher nominates the class or the learners still need encouragement from the teacher to do class activities, this class is considered very low- and low-motivated respectively. Figure 1 below demonstrates motivational behaviors that went on during five weeks.

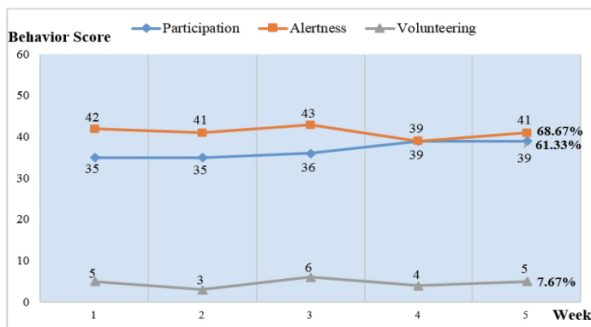


Figure 1. Motivational behaviors

Figure 1 shows that from week 1 to 5, the participation scores of the experimental group are 35, 35, 36, 39 and 39 which is equal to 184 or 61.33 percent. Moreover, the scores of alertness are 42, 41, 43, 39 and 41 which is equal to 206 or 68.67 percent. The volunteering scores are 5, 3, 6, 4 and 5 which is equal to 23 or 7.67 percent. As presented in the figure above, the experimental group is, therefore, considered somewhat motivated but still not highly motivated. This is because only the alertness score meets the criteria of high motivation. However, the participation score (61.33%) shows some motivation because more than 33 percent but still less than 66.67 percent of the class showed participation in the class. In addition, the volunteering rate in class was very low, lower than 33.33 percent, which can be either because the learners were not interested in volunteering or because they relied on the teacher to nominate the class and provide encouragement most of the class time.

Apart from the aforementioned, there were some other behaviors that indicated low motivation. During classes, some learners were found (approximately 10% of the class) playing on cell phones, having off-topic conversations with friends sitting nearby, sitting silently at the back of the room, doing another subject's homework, often coming to class more than 30 minutes late, being absent most of the time, and even sleeping during class instead of paying attention to classroom activities and the teacher.

V. DISCUSSION AND CONCLUSION

A. The effect of self-imaging activities on motivation

The results revealed that self-imaging activities helped increase EFL learners' motivation in learning English by increasing their motivation level. When investigating each influential motivation aspect, only intrinsic motivation increased. This might be one of the reasons why the motivation was just slightly different from prior to receiving the treatment. This result was found to be related to the previous study conducted by Dörnyei and Chan [27], indicating that ideal self-image was related to the motivational power of the L2 self-image. The other aspects of motivation (the results of extrinsic motivation, self-efficacy, attitudes towards

learning English, and L2 anxiety) were not statistically different. Moreover, the learners' opinions helped to confirm this. It suggested that the learners tended to open their minds for English as their intrinsic motivation increased a little. The learners knew what they wanted from the English language as well as what it could afford them (extrinsic motivation). They valued English, paid more attention to learning the language and still had confidence in themselves (attitudes toward learning English) although it was difficult for them. This was because of their strong beliefs in their ability to achieve their L2 learning goal (self-efficacy). On the other hand, there was still a great obstruction (L2 anxiety) that had an opposite effect in those factors. It is noted that although this study was conducted in shorter duration than the previous research studies, there were some changes in motivation. This factor might have also affected the level of motivation.

In addition, many previous scholars such as Gardner [3]; Ames and Ames [28]; Oxford and Shearin [29]; Dörnyei [30]; [31] and Dörnyei, Csizer & Nemeth, [7] wrote about motivation as the force that drives people to change their behavior in order to reach their goals. This resulted in a focus on behaviors of the learners in the classroom. During classroom sessions, the learners' behaviors showed high motivation regarding alertness during class time. Participation was another behavioral factor underlying the learners' motivation, and it was found that the learners were somewhat motivated. However, the other motivational behavior, volunteering during class, was still very low, and it indicated no motivation during class as a whole. With regard to motivation behaviors, it can be concluded that the learners were somewhat motivated. The level of motivational increase and the quite-motivated behaviors were consistent with Al-shehri [32], proving that motivated effort and behavior resulted from the perception of the self which reveals that learners had already known their present and future ideal selves. In addition to Al-shehri [32], Y. Fukada, T. Fukada, Falout and Murphy [33] developed possible selves activities to promote motivational learning behaviors in classroom, and it was found that possible selves or goal-setting self activities could be used in the classroom to encourage the learning behaviors. This implied self-imaging was related to learning behaviors as previously pointed out by Ryan [34] and Yang and Kim [35].

B. Implications of applications of the finding to practice

The main finding with regard to pedagogical implications is that self-imaging activities can be used or applied as supplemental classroom activities. This could also be adapted to English language skill lessons. The self-imaging activities could make the language classroom both more interesting and more relevant to learners' daily

lives. Moreover, EFL teachers should be aware that motivation in actuality is always fluctuating, so sustaining motivation is important. Although it can be hard to keep the learners on track, reminding them of their goals or future images is a good idea as such things play a crucial role in driving the learners towards achieving them.

C. *Limitations in the study*

The convenience sampling method was employed. Therefore, the findings of this study cannot be generalized to the entire low-motivated EFL learner population and in other settings as generalizability requires data on larger populations based on the probability sampling. In addition, the study was conducted in a short time, so this might affect the results of the study.

D. *Suggestions for future studies*

The study was conducted during a short time. Despite this time limit, some changes were found in motivation. However, there is always fluctuation in motivation that might arise from individuals' minds or other outside factors. This cannot be controlled because everyone encounters different situations each day. The main suggestion for future researchers is an in-depth long-term study – such as one semester, two semesters or perhaps even the whole academic year. In addition to a long-term study, it might be a good idea to develop more types of self-imagining activities. Adapting the activities to the teaching plan and study units might be more effective. As mentioned in the implications, the activities should be applicable to reality and closely related to daily life situations. Apart from additional types of activities, other factors should be taken into consideration such as teachers, classroom environments, teaching styles, and genders.

REFERENCES

- [1] S. D. Krashen, *The Input Hypothesis: Issues and Implications*, New York: Longman, 1985.
- [2] R. C. Gardner and W. E. Lambert, *Attitudes and Motivation in Second Language Learning*. Rowley, Mass.: Newbury House Publishers, 1972.
- [3] R. C. Gardner, *Social psychology and second language learning: The role of attitudes and motivation*. London: Edward Arnold, 1985.
- [4] Y. Kachru, *Teaching and learning of World Englishes*. In *Handbook of research in second language teaching and learning*, E. Hinkel Ed. Mahwah, NJ: Lawrence Erlbaum, 2005, pp. 155-173
- [5] E. Ushioda, "Language motivation in a reconfigured Europe: Access, identity, autonomy," *Journal of Multilingual and Multicultural Development*, vol. 27 (2), 2006, pp. 148-161.
- [6] Z. Dörnyei and K. Csizér, "Motivational dynamics in second language acquisition: Results of a longitudinal nationwide survey," *Applied Linguistics*, vol. 23, 2002, pp. 421-462.
- [7] Z. Dörnyei, K. Csizér and N. Németh, *Motivation, language attitudes and globalisation*. Clevedon: Multilingual Matters Ltd, 2006.
- [8] Z. Dörnyei, "The L2 motivational self system. in *Motivation, Language Identity and the L2 Self*, Z. Dörnyei and E. Ushioda Eds. Bristol, UK: Multilingual Matters, 2009, pp. 9-42.
- [9] H. R. Markus and P. Nurius, "Possible selves," *American Psychologist*, vol.41, 1986, 954-969.
- [10] E. T. Higgins, "Self-discrepancy: A theory relating self and affect," *Psychological Review*, vol.94, 1987, pp. 319-340.
- [11] Z. Dörnyei and I. Ottó, "Motivation in action: A process model of L2 motivation," *Working Papers in Applied Linguistics (ThamesValley University)*, vol 4, 1998, pp.43-69.
- [12] S. Berkovits, *Guided Imagery: Successful Techniques to Improve School Performance and Self-esteem*. Duluth, MN: Whole Person Associates, 2005.
- [13] W. Fezler, *Creative imagery: How to visualise in all five senses*. New York: Simon & Schuster, 1989.
- [14] H. Leuner, G. Horn and E. Klessmann, *Guided affective imagery with children and adolescents*. New York: Plenum, 1983.
- [15] J. L. Singer, *Imagery in Psychotherapy*. Washington, DC American Psychological Association, 2006.
- [16] C. E. McMahon, "Images as motives and motivators: A historical perspective," *American Journal of Psychology*, 86, 1973, pp. 465-490.
- [17] H. R. Markus, Foreword. in *Possible Selves: Theory, Research and Applications*, C. Dunkel and J. Kerpelman Eds. New York: Nova Science, 2006, pp. 11-14.
- [18] E. Wenger, *Communities of Practice: Learning, Meaning and Identity*. Cambridge: Cambridge University Press, 1998.
- [19] R. E. Boyatzis and K. Akrivou, *The ideal self as the driver of intentional change*. *Journal of Management Development*, vol. 257, 2006, pp. 624-642.
- [20] A. Wiriyaichitra, "A Thai university English scenario in the coming decade," *Thai TESOL Newsletter*, vol. 14(1), 2001, pp. 4-7.
- [21] D. T. Campbell and J. C. Stanley, "Experimental and quasi-experimental designs for research on teaching," in *Handbook of Research on Teaching*, N. L. Gage (Ed.) Chicago, IL: Rand McNally, 1963, pp. 171-246.
- [22] M. J. Guilloteaux and Z. Dörnyei, "Motivating language learners: A classroom oriented investigation of the effects of motivational strategies on student motivation," *TESOL Quarterly*, vol. 42(1), 2008, pp. 55-77.

- [23] Z. Dörnyei and T. Taguchi, *Questionnaires in second language research: Construction, administration and processing*. New York, NY: Routledge, 2010.
- [24] M. Ueki and O. Takeuchi, "Forming a clearer image of the ideal L2 self: the L2 motivational self system and learner autonomy in a Japanese EFL context," *Innovation in Language and Teaching*, vol. 7:3, 2013, pp. 238-252.
- [25] S. Ryan, *The ideal L2 selves of Japanese learners of English*. Doctoral Dissertation, University of Nottingham, NG, 2008.
- [26] A. Bandura, *Self-efficacy: The exercise of control*. New York: Freeman, 1997.
- [27] Z. Dörnyei and L. Chan, "Motivation and vision: An analysis of future L2 self-images, sensory styles, and imagery capacity across two target languages," *Language Learning*, vol. 63(3), 2013, pp. 437-462.
- [28] C. Ames and R. Ames, *Research in Motivation in Education*, San Diego: Academic Press, 1989.
- [29] R. L. Oxford, and J. Shearin, "Language learning motivation: Expanding the theoretical framework," *The Modern Language Journal*, vol. 78, 1994, pp. 12-28.
- [30] Z. Dörnyei, "Motivation and motivating in the foreign language classroom," *Modern Language Journal*, vol. 78, 1994, pp. 273-284.
- [31] Z. Dörnyei, "New ways of motivating foreign language learners: Generating vision," *Links*, vol. 38(Winter), 2008, pp. 3-4.
- [32] A.H. Al-Shehri, "Motivation and vision: the relation between the ideal L2 self, imagination and visual style," in *Motivation, Language Identity and the L2 Self*, Z. Dörnyei and E. Ushioda Eds. Bristol, UK: Matters, 2009, pp.164–171.
- [33] Y. Fukada, T. Fukuda, J. Falout, and T. Murphey, *Increasing motivation with possible selves*, in *JALT2010 Conference Proceedings*, A. Stewart Ed, 2011.
- [34] S. Ryan, *Self and identity in L2 motivation in Japan: The ideal L2 self and Japanese learners of English*. in *Motivation, Language Identity and the L2 Self*, Z. Dörnyei & E. Ushioda Eds. Clevedon: Multilingual Matters, 2009.
- [35] J. S. Yang and T.-Y. Kim, "The L2 motivational self system and perceptual learning styles of Chinese, Korean, and Swedish students," *English Teaching*, vol. 66(1), 2011, pp. 141-162.

Establishing and Implementing Good Practices E-Government (A Case Study: e-Government Implementation between Korea and Indonesia)

¹ Lubna Salsabila, ² Eko Priyo Purnomo, Ph.D

^{1,2} *International Program of Government Affairs*
Universitas Muhammadiyah Yogyakarta
Yogyakarta, Indonesia

E-mail: ¹ lubna.salsa@gmail.com, ² eko@umy.ac.id

ABSTRACT

These academic paper aims to describe the factors that lead South Korea into succeed in implementation of e-Government. At least there are factors that Indonesia government needs to learn and see South Korea as a benchmark in implementation of e-Government. First, the regulation and laws that needs to be more specific. Second, an integrated communication among governmental agencies is needed. Third, human resources ability in understanding of e-Government concept need to be develops. Fourth, the role of the leaders is the main key of successful implementation in South Korea. Those factors which are also found as a lack in implementation of e-Government in Indonesia makes South Korea can be seen as benchmark for Indonesia in adopting the implementation of e-Government practice in South Korea. The researchers use qualitative methodology in analyzing the data by using literature reviews, journals, annual report and books as a secondary data.

Keywords: South Korea E-Government, Successful Factors, South Korea as Benchmark)

I. INTRODUCTION

South Korea and Indonesia both experienced a long period of colonization. Korea several times occupied by China, and the last colonized Japan (1910-1945) (Hartono, 1987). In the other side, Indonesia being colonized by more than one country, there were Portuguese, Dutch and Japan that colonized Indonesia for approximately 350 years. Both of it born under conditions of cold war between the two countries at that time and as a result both countries face the same fundamental issue of when they have to establish nationhood, build political institutions, economic development and government administration. Until the end of the 1950s, a socio-economic and political South Korea condition is not much different from Indonesia. Since the 1980s, however, South Korea development their economic until its rising outpacing Indonesia, even when both of the countries faces the Asian Monetary Crisis condition at 1977, Korea is much faster in recovering its conditions [1]. Not only restore the economical conditions to its original positions, but also developing several areas such as its politics, government and public policy [1].

Furthermore, Information and Communication Technologies (ICT) can seen as a medicines for curing a nation from distress of corruption, mismanagement governance, inflation, monopolies, business stagnation, illiteracy and so important aspect concerns development and implementation of ICTs for Governance [2]. In this case, South Korea as a leading county in implementing good governance by using ICT [3]. Korea surprised the

world with the development of IT education environment and rapidly extend the information and communication infrastructure and thus also to keep rapidity with multimedia learning environment so that Korea can implement quickly oriented education in pursuit of the constitution that has been changed [4].

Indonesia is left behind compared to others countries in ASIA [3]. Indonesia as a developing country where communication infrastructures are not established yet is effecting the number of people in obtaining the information. The availability of this infrastructure is very pronounced in areas that the process of obtaining information is still limited. Until now, the infrastructure facilities are only located in major cities in Indonesia, but not in remote towns or border areas.

However, Indonesia still needs to learn from other countries in ASIA to developing its ICT systems in the future. There are two reasons why this academic paper in this study has become important which are: *First*, with globalization and modernization infrastructure and technology are important, through a fine infrastructure and technology government will able to communicate in appropriate way, ICT is believed as one way that can be uses by the government in communicating and implementing good government concept especially effectiveness, efficiency and transparency value. *Second*, there are many consideration and potential implications of implementing and designing e-government also its impact on the citizens that need to be considered by Indonesian government to adopt. Therefore, this academic paper will discuss about what are the factors

that made South Korea successes in implementing E-Government and can it become a benchmark in implementing E-Government in Indonesia.

II. THEORETICAL FRAMEWORK

A. E-Government & E-Governance Concept

E-Government is an information technology (ICTs) that being uses by the government agencies [5]. The technologies that government use such as Wide Area Networks, the Internet, and mobile computing have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serves a better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. Less of corruption, increased transparency, greater convenience, revenue growth, or cost reductions are the resulting benefits can be (World Bank, 2015). That utilizing the networked systems efficiently to realizing a better quality in the provision of public services (Global Business Dialogue on Electronic Commerce – GBDe).

E-government divided into three specifications: (1) government to citizen (G2C/ C2G), where the citizens are able to access government information and services online; (2) government to business (G2B/ B2G), which allows online interaction between government and the private sector; and (3) government to government (G2G/ G2G), depending on various levels of governmental agencies, to deliver services and allocate responsibilities [6].

E-government which is using information technology, and especially the Internet, a one of government tools in improving the delivery of government services to citizens, businesses, and other government agencies. That also allows the citizens, businesses, and other government agencies to interact with each others.

Government is an institutional superstructure that society uses to translate politics into policies and legislation while governance is the outcome of the interaction of government, the public service, policy and programs that government made [5]. Governance implies the processes and institutions, both formal and informal that acts with authority and creates formal obligations that conducted exclusively by governments [7].

According to UNESCO, e-Governance is the using of information and communication technologies by the public sectors agencies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. E- Governance is a broader concept that deals with a complex relationship and networks within government regarding the usage and application of ICTs where e-government is limited to develop (Sheridan & Riley, 2006).

B. Definitions of Implementation

According to Harsono (2002) in Hadiyanti (2017), implementation is a process for implementing policies into action policy from politics into administration. Development policies in the context of the consummation of a program. Moreover, Setiawan (2004), describe implementation as an expansion of the activities of the mutual interaction between the process of adjusting the goals and actions to achieve them as well as implementing network requires an effective bureaucracy.

Furthermore, implementation is the actions performed by individuals/officials or groups or private government aimed at achieving the objectives in the policy-making. (Van Meter and Van Horn in Wahab, 2001: 65).

III. METHODOLOGY

To analyzing the factors that bring South Korea to succeed in implementation of e-Government, this academic paper used a qualitative method. Moleong in Arizma (2012) qualitative research method is a method of research study that aims to understand the phenomenon of what is experienced by the subject of the research for example, behavior, perceptions, motivations, actions, holistically, and by means of the description in the form of words and language, in a special natural context and by utilizing a variety of natural methods. The research took place both in South Korea and Indonesia since it is a comparison study of South Korean and Indonesia in e-Government practices in 2014.

Researchers using secondary data from various sources that required to answer the research question. The data that being use in this research is a secondary data in form of books, journals, websites, and other literature that can explain about e-Government status both in South Korea and Indonesia.

IV. ANALYSIS

C. ICT in South Korea

South Korea and Indonesia both experienced a long period of colonization. Both of it born under conditions of cold war between the two countries at that time and as a result both countries face the same fundamental issue of when they have to establish nationhood, build political institutions, economic development and government administration. Until the end of the 1950s, a socio-economic and political South Korea condition is not much different from Indonesia. Since the 1980s, however, South Korea development their economic until its rising outpacing Indonesia, even when both of the countries faces the Asian Monetary Crisis condition at 1977, Korea is much faster in recovering its conditions [1]. Not only restore the economical conditions to its original positions,

but also developing several areas such as its politics, government and public policy [1].

Public sectors are viewed as a rigid establishment with poor service quality and inefficient operations [9]. However, many citizens are becoming increasingly demanding on improved public services. The evolution of capabilities is influenced by the pacing of experience (Eisenhardt & Martin, 2000). If capabilities are developed too soon, people can be overwhelmed, as their ability to absorb new information is limited (Cohen & Levinthal, 1990). Based on that reasons its forces the governments to re-think their existing modes of operation to establish new strategic that initiatives and evolutionary for the public sectors operation based on the current situation nowadays which is fast-moving and competitive environment [6]. By analyzing the environment and evaluating existing capabilities, governments can develop their strategic [10]. Using technology as a resource and better alignment between technology and business processes would help to achieve sustainable competitive advantage for organizations for the long period [11].

Information and Communication Technologies (ICT) have been seen as a miracle medicines for curing a nation from distress of corruption, mismanagement governance, inflation, monopolies, business stagnation, illiteracy and so important aspect concerns development and implementation of ICTs for Governance [2]. In this case South Korea is leading in implementing good governance by using ICT. Korea surprised the world with the development of IT education environment and rapidly extend the information and communication infrastructure and thus also to keep rapidity with multimedia learning environment so that you can implement quickly oriented education in pursuit of the constitution that has been changed [4].

With imagination, creativity, science technology and ICT, the Ministry of Science, ICT and Future Planning (MSIP) is leading the South Korea's industrial innovation while reviving industries of new growth engines and hope. As Korea is undergoing successful industrial development and information, MSIP is concentrating on spreading the power of industries under the new vision of creative economy, and promises to open a new possibility for tomorrow based on international cooperation with our endless passion and cheerful global spirit. By implementing 5 strategies, MSIP aim to achieve its vision which is to build a country where everyone is happy [13]. It cuts costs and delivery times for the government and simultaneously becomes a tool and balances against the government. The e-government in short is tool governance - transparency, participation, regulations and accountability [2].

Fig 1. Ministry of Science, ICT and Future Planning (MSIP)'s Vision



Source: <http://msip.go.kr/>

Based on thus 5 strategies that are made by Ministry of Science, ICT and Future Planning (MISP)'s Vision, The first strategy is *Establishment of Creative Economy Ecosystem*, in this strategy MSIP is promising Korea with creative economy ecosystem using 5 techniques; (1) to build the Republic of Korea full of creative ideas and talents by make national movement of "imagination", cultivation of interdisciplinary science talents, cultivation of ICT professionals; (2) to translate creative ideas into commercialization and entrepreneurship by making a strong commercialization capacity of university and gov-funded research institutes, and support for commercialization of people's ideas; (3) to make new industries and jobs and strengthen existing industries by utilizing S&T and ICT, promoting of internet- related industries, and nationwide information; (4) to support local industries to grow into industry-academia-research community by development of local specific industries, cultivation of local industries specialist, establishment to start up ecosystem infrastructure and stronger role of local community; and (5) to create, protect, utilize intellectual properties by creating high values-added IP, advancement of IP protection system and maximization of use on IP and proper compensation.

The second strategy is *National Research Development & Innovation Reinforcement*. In this strategy MIP aim to build an active Korea with strong innovation capacity and national research development for scientist to pursue research works by using 4 techniques; (1) to strengthen the fundamental of creative R&D with future oriented Strategic R&D by open R&D plan, R&D Investment, and improving assessment; (2) to foster promising future growth engine through smart approach by development of future core technology, i.e., stem cell, brain research, *nano*-materials and clean energy, space powerhouse with independent technologies, and possession of radiation medical technology & development of nuclear power technology; (3) to cultivate government funded research institutes into world's best research institute by Re-establishment the

role of government-funded research institutes (focus on large-scale, public, original technologies, and larger proportion of project support fund in government-funded institutes major project fund), establishment of stable research environment (focus on better working environment of non-regular workers, and improvement project based system), and spread of research performance (focus in business activities of research institutes, and expansion of SME technology transfer); (4) to build research-friendly society for scientist and engineers by doing expansion of reception rate or S&T pension fund, beneficial to patriots and veterans in S&T and implementation of related laws, job creation through promotion and support for cooperative association for scientist and engineers, cultivation and support for female scientist and engineers, and operation of support center for retired scientist and engineers.

The third strategy is *Promotion of SW and Content as the Core of Economy*. With main idea of 1+1 amount to ∞ , MSIP using 4 techniques in pursuing it; (1) to foster SW, the language of the 21st century (SW education programs for elementary and middle schools/ On-site SW education for universities and companies, SW-local industry convergence/ SW Convergences Cluster for job creation, SW core technology development, SW research activation, and foundation for fair trades of SW); (2) to go global with Korean-style content by cultivation of Korean-style content, sharing and utilization of original source, and project for shared growth/ calls for participation of content SMEs; (3) to remove regulatory barriers among media industries and nurture new convergence service by make a better regulations on technology convergence service, cutting-edge broadcasting service, and promoting of smart media and advertisement industry; (4) to build world's best network to provide fertile soil for C-P-N-D ecosystem by on setting of nationwide Giga internet era (ensure 90% penetration rate of 1 Giga internet by 2017, promoting of the world's 1st 10 Giga internet service/ tech development by '13, beta service by '14), more free WiFi zones (ensure 90% penetration rate of 1 Giga internet by 2017 from 2000 place into 10000 places), infrastructure for next-generation mobile telecommunication (development of wireless internet service up to 10 times faster than LTE/Spectrum auction for 1.8/2.0 GHz bands).

The fourth strategy is *International Cooperation and Globalization*. To make strong Korea with advanced research environment and competitive research partners with 3 techniques; (1) to secure leadership in the global community; (2) to develop international science business belt into a global research base for basic science by research environment that promotes creativity of global researchers, improving Future Nobel Laureates in Science Research, and effective business commercializing basic science research outcomes; (3) to expand the scale of K-

move by make a strategic post for advancing into the global market (establishing responsible office for supporting venture companies and increasing the number of IT support centers aboard), Korean ICT talents in the global job markets, Global K-Startup (supporting globalization by encouraging investment).

The fifth strategy is *Happier Korea with Wider Use of ICT*. To achieve this strategy MSIP use 4 techniques; (1) to use ICT as tool to resolve social issues; (2) to reduce household communication cost; (3) to build a safe and convenient internet environment; and (4) to deliver happiness through post office network.

From the 5 strategies we can be concluded that MSIP in doing its work focus on the infrastructure (education and technology) to build a world's best infrastructure. By performing a variety of ways to improve education from primary school to university, doing a variety of investments to the world of research, and provide adequate facilities and security for scientists and engineers to create a better human resources to be a professional in its own specialties will build a strengthen the process to achieve its goal. Also, putting the right person in the right place to make it efficient and effective is one of its focuses. According with the mindset of Korean who always does everything quickly set out in the strategy conducted by MSIP, which is also one factor that makes Korea so could be in the top position in the area of ICT [1].

It can be seen that South Korea government focus on several factors in the implementation of e-Government. *First*, South Korea government paid a lot of attention in infrastructure. *Second*, South Korea government allocated a lot of budget for education by providing fully funded programs for research and education programs.

According to Klievink and Janssen (2009) there are four stages models in improving public service delivery stage by stage [14]. In which a higher levels of customer orientation require higher levels of flexibility because a unique business process can be required for each request, crossing many organizations and departments. The four stages models are;

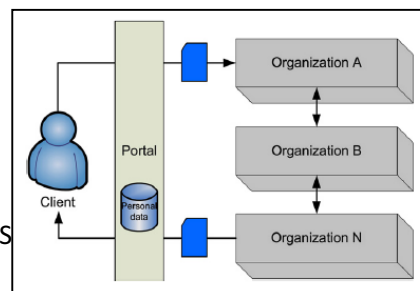
1. *Stovepipes*: Few applications, services or products are interconnected, and information is not shared.
2. *Integrated organizations*: Service delivery and IT within organizations are integrated to create a one-stop shop at the organizational level. There are hardly any inter-organizational business models.
3. *Nationwide portal*: A nationwide portal is introduced to provide access to existing products, including a digital safe. The digital safe can be used to provide government organizations with access to information when their services and products are requested.
4. *Inter-organizational integration*: Clearly defined and standardized cross-agency services are bundled and integrated, and can be requested as virtually one service via the portal.

5. *Demand-driven, joined-up government*: Instead of citizens or businesses having to find and request services, the portal will search for the relevant services and make recommendations. The chain is reversed and becomes demand-driven rather than supply driven.

In South Korea case nowadays, everything is already integrated. For the example if the citizen wants to make a permit the just need to visit related institution or administration through internet or homepage after that they only need to log –in that require a security code. The next step they need to do is to visit city hall or its branch (kios-k) that located in every small town in South Korea or they also able to just come to the nearest bank for submissions. In this case they are not required to fill up a personal data requirement; the citizen personal data already will automatically shows up. It is because all of the data including income and insurance already tossed in government server which makes it more effective and efficient.

This situation makes South Korea placed in the 4th stage models, *Inter-organizational integration*, in which focus on what customers need, rather than what individual needs, services should be leading, resulting in inter-organizational integration. This means that the organizations involved in a service-delivery chain need to work together. The various processes involved in carrying out the citizen request are integrated in an overall process or one portal.

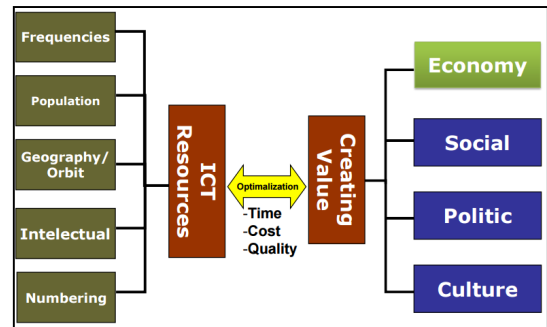
Fig 2. Inter-organizational integration Stage Model



D. Indonesia e-Government Status

In Indonesia, e-government was officially introduced to public administration by Presidential Directive No 6/2001 on Telematics, which states that the government of Indonesia has to use telematics technology to support good governance. In Indonesia, E-government is needed for the following reasons: (1) to support the government change towards a democratic governance practices; (2) to support the application of authority balances between central and local government; (3) to facilitate communication between central and local governments; (4) to gain openness; and (5) transformation towards information society era [15].

Fig 3. E- Government Development Strategy



Source: Ministry of Communication and Information Indonesia.

According to The World Economic Forum (WEF), Indonesia currently in 98th position (South Korea is in 11th position) in case of infrastructure, for the skill of its human resources is in 63rd position (South Korea is in 39th position), 77th position for the usage of the program (South Korea is in 6th position), and the in impact that achieve by implementing of the program (e-Government/ ICT) Indonesia is in 74th position (South Korea is in 5th position). Based on that data we can see there are a big distance between Indonesia condition and South Korea conditions.

In Indonesia case, until nowadays infrastructure are not spread well yet. The infrastructures were well build and established only in the big cities such as Jakarta, Surabaya, Yogyakarta, Bandung, Medan and etc. but not in the small cities either border area. Which is one of the biggest problems that need to be solve by Indonesia government if they do not want to left behind. However, we cannot forget about the fact that Indonesia is an archipelago and separated by oceans, which makes it another challenge for Indonesia government in infrastructure development. The others differences in the human resources skill, in South Korea government tries to develop citizen education in the sectors of technology. From those data proving that the human resources skill are related to usage of the programs.

According to Indrajit (2013) [16] there are 3 (tree) challenges that government meets in implementation of e-Government;

1. Relating to a way create and determine the digital access channels,
2. The involvement of other institutions outside the government i.e. private sectors in developing infrastructure and superstructure that need,
3. In formulation institutional strategy, especially with investment issues and operational costs.

Meanwhile according to Ministry of Communication and Information Indonesia (2010) there are 7 (seven) challenges that need to be considered by the government;

1. *Convergence Law* Convergence applications and services every sector (broadcasting, telecommunication, internet) regulated by separated law and will using one licensing approach and should be integrated by develop convergence law,
2. *Infrastructure*; telecommunication infrastructure need to be upgrade to introduce convergence application and upgrading only could be done by expanding capacity of access and backbone in several cities.
3. *Content and application*; digital access channel that able to access by the citizen in easy way,
4. *Local Industries*; the involvement of local industries in development of the program,
5. *Cyber Crime*; Indonesian still facing carding case on online transaction and misuse of information to manipulate business and transaction,
6. *Free Flow Information*; focus on how to enrichment domestic cultural (way of life) with global information where pornography still a one of big issue,
7. *Children and women protection*; abuse of child and woman on internet and human transaction on internet is another issue that Indonesia government need to face.

In addition to various those poor conditions as described above, the development of e-Government in Indonesia is proof that an understanding of the potential of telecommunication particularly is still low. This poor condition happens at all levels, both in the bureaucracy and private. Utilization of e-Government to reduce the occurrence of events of fraud, criminal, until the terror that originated from identity fraud such as identity cards and passports are still not showing signs of improvement. Similarly, the various cases of smuggling and abuse of customs documents is even more prevalent and increasingly advanced modes of operation.

Therefore, the implementation of e-government that are not supported by an adequate infrastructure, a lack of understanding, vision and mission that inconsistent and not conducive regulatory rules and policies across sectors has made the achievement of the e-government program Indonesia is still in the early stages.

E. South Korea e-Government Practice as a Bechmark fo Indonesia e-Government

Since computer skill education and Internet was first introduced in Korea in 1970, the Korean government has established an adjustment effort in education, over the time. Plans to adapt ICT in education in Korea began in

July 1970, in early 1999 the country through the Framework Act provides policies to promote ICT and in July 1996 formed Enforcement Plan to adapt education in understanding the progress of time. When the Korean government established a "Cyber 21" and "White Paper" of the government is hoping that when he graduated from school students have been confident and creative in the use of new Information and Communication Technology and understood as a technology in social life (Ministry of Science, ICT and Future Planning (MSIP) of South Korea).

According to MSIP, development of infrastructure for ICT facilities in the Korean government began to use in 1997 and has been used as the Three Annual Plan for ICT Infrastructure Construction of the period 1997 - 1999. This then has changed to the Comprehensive Plan for ICT Use Elementary and Secondary School for the period 1998 - 2000 out of 1998. The policy had been changed back, and the last one is to be a Five Year Plan for Education Development for the period 1999-2003.

From thus data, it is proving that South Korea government is a few steps ahead of Indonesia. With the development of the ICT sector, South Korea improve infrastructure related information and technologies, expand the sales network via the Internet, high speed and high capacity networking systems, prepare regulations to encourage private sector participation, competition in the market, issues related to labor and also techniques privatization optimal, In 1998 the government carried out the privatization of companies such as Korea Telecom, Korea Electric Power Corporation and Korea Gas Corporation. Korean ICT development target in 2014 is to reach the level of internet connection household sector amounted to 8% or 30% of the entire population.

Key of the success of South Korea related infrastructure is how they identify the infrastructure to support the economy in accordance with the Five-year Development Plan. Besides that the role of leaders and policy makers in the implementation of the strategy that has been set and also in the allocation of resources that create coordination among ministries and also cooperation in developing infrastructure related policies. Seoul- Busan road developments is a cornerstone of industrialization in South Korea and makes a key contribution in the growth of the Korean economy. Another thing is the key to the success of Korea is the diversity of sources of funding for infrastructure that does not only come from the government budget.

When the government sets the focus of the economy is exports, the whole strategy developed is directed to support exports, and infrastructure is an important factor. One of the things that inhibit Indonesia's economic growth is the lack of infrastructure and poor infrastructure. In terms of infrastructure Indonesia ranked 98 while Korea is ranked 11 (WEF, 2015). The

transportation system that is weak and underdeveloped logistics services trade in Indonesia, some regions such as Papua have to pay two or three times the cost of the price in Jakarta for essential commodities such as cement.

Strong political leader and also the low level of corruption in Korea is also instrumental in supporting the advancement of infrastructure. Indonesia's economy is not yet stable, has a high level of corruption in almost all sectors. While there are authorized institutions related to road construction and also the maximum load for a particular road, but still can be seen from many roads with poor quality in Indonesia.

There are 3 (three) solutions that being offers by Sosiawan (2008) in responding to challenges and barriers in implementation of e-Government in Indonesia.

1. The central government needs to create a master plan and a grand strategy for e-Government as an outlined in laws or government regulations, and instructions for implementation requires technical implementation actions and the provision of means and not merely just a concepts. In addition, the central government and local governments need to consider the operating budget and adequate maintenance budget.
2. The need for education and human resources training in information technology and communication which are integrated. Human resource development in the implementation of e-Government needs serious treatment and undertaken jointly by governments, universities, and private parties. The most important is the successful implementation of e-Government lies not in the technology but relies on the human ability to manage. On the managerial side needs to make a model of e-government with a proper management, both for the central government and local government. In the existing organizational structure in departments, ministries and government bodies are non-departmental needs to be clarified part of an organization which handles the e-Government adjusted to the duties and functions of the organizational structures that already exist in order to avoid ambiguities in the management and implementation of e-government in local governance , Another thing to remember, that in the management of e-Government in the awareness of both the budget, implementation, monitoring and evaluation is essential.
3. In terms of facilities and infrastructure; it needs a solution in the form of a government policy to embrace the private sector, especially ICT provider in the form of integrated cooperation that is beneficial to both parties. Central and local government assisted private parties should make

additions access and a range of telecommunications infrastructure for all people from top to bottom. Including in this case are establishes tariffs that is transparent and affordable for all.

V. CONCLUSION

Korea and Indonesia gained independence in 1945, however South Korea's infrastructure progress far beyond Indonesia. The key is a strong political leader. Regulation and bureaucracy long range strongly supports the advancement of infrastructure in Korea. So Indonesia needs a strong political leader as well as South Korea. A state leaders may change, but the sustainability of development still must go forward because of a policy that is likely to change back and forth it would take a very large cost.

Therefore, the required of single blueprint or master plan for e-Government in Indonesia in line with the direction of national development is good for long-term and short-term approach aspects of government, politics, culture, management, economics, anthropology, philosophy, religion, agriculture, industry, trade, defense and security, and so forth. For indeed implementing e-Government is identical to organize government policies to benefit society by improving the efficiency and effectiveness of public servants thoroughly.

However, it would be very hard for Indonesia to copying the implementation of e-Government practice in South Korea since there is a huge differences in many aspect such as the geographically aspect. Besides of copying Indonesia should adopt some principles that South Korea implement in the process of practicing the e-Government. By being consistence with one of the policy or the program will create a big impact. The program that always changing in the same time as the leader being change will never create any changes.

REFERENCES

- [1] Mas'oed, Mohtar. & Seung-Yoon, Yang. (2005). *Memahami Politik Korea*. Yogyakarta: Gadjah Mada University Press.
- [2] Ghayur, Adeel. (2006). *Towards Good Governance: Developing an e-Government*. Islamabad: Pakistan Institute of Development Economics.
- [3] The World's Economic Forum (WEF) <http://www.weforum.org/>
- [4] Ahn, C. J. S. (2014). *A Study on the Improvements of Information Security Management System for Environment Education Institutes*. Korea: International Journal of Security and Its Applications.
- [5] Kumar, M., & Sinha, O. P. (2007). *M-government–mobile technology for e-government*.

- In International conference on e-government, India (pp. 294-301).
- [6] Moon, M. (2002). The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review*, 62(4), 424–433.
- [7] Keohane, R. O. and Nye, J. S. Introduction, In Nye, J. S. and Donahue, J.D. (editors). *Governance in a Globalization World*. Washington, D.C.: Brookings Institution Press. 2000.
- [8] Hadiyanti, R. R. (2017). Implementasi peraturan pemerintah nomor 8 tahun 2003 tentang pedoman organisasi perangkat daerah pemerintah kota samarinda. *JURNAL UNIVERSITAS MULAWARMAN*, 1(3), 985-997.
- [9] Moon, M., & Bretschneider, S. (2002). Does the perception of red tape constrain IT innovativeness in organizations? Unexpected results from simultaneous equation model and implications. *Journal of Public Administration Research and Theory*, 11(3), 327–352.
- [10] Ho, A. (2002). Reinventing local governments and the e-government initiative. *Public Administration Review*, 62 (4), 434–444.
- [11] Jarvenpaa, S., & Leidner, D. (1998). An information company in Mexico: Extending the RBV of the firm to a developing country context. *Information Systems Research*, 9(4), 342–361.
- [12] Ministry of Science, ICT and Future Planning. (2014). *Korea's Global Cooperation for Better Future: Opening a new era of global happiness with the world's leading science technology and ICT*. Korea: Ministry of Science, ICT and Future Planning.
- [13] Klievink, B., & Janssen, M. (2009). Realizing joined-up government—Dynamic capabilities and stage models for transformation. *Government Information Quarterly*, 26(2), 275-284.
- [14] Haryono, T., & Widiwardono, Y. K. (2003). Current status and issues of e-Government in Indonesia. Retrieved February, 14, 2007.
- [15] Indrajit, Richardus Eko. (2013). Tiga Tantangan Besar E-Government. Seri 999 E-Artikel Sistem dan Teknologi Informasi.
- [16] Dahgel, Peter. (2005). *The Internet, Public Spheres, and Political Communication: Dispersion and Deliberation*. Taylor & Francis Inc.
- [17] Richardson, L., Denzin, N. K., & Lincoln, Y. S. (2000). *Handbook of qualitative research. Writing: A method of inquiry*, 923-948.
- [18] Setiawan, Muhammad Budi. (2010). *Peluang dan Tantangan Industri TIK dalam pembangunan ekonomi nasional*. Jakarta: Kementerian Komunikasi dan Informasi.
- [19] Sosiawan, E. A. (2015, June). Tantangan dan Hambatan dalam implementasi E-Government di Indonesia. In *Seminar Nasional Informatika (SEMNASIF)*(Vol. 1, No. 5).
- [20] Sugiyono, M. P. P. (2007). *Pendekatan Kuantitatif: Kualitatif, dan R&D*. Bandung: Alfabeta.
- Internet :**
- [21] Admin. (2012). *Vision and Strategies of Ministry of Science, ICT and Future Planning*. Retrived November, 7, 2016 on 18.40 from <http://www.english.msip.go.kr/>
- Others:**
- [22] Ministry of Science, ICT and Future Planning (MSIP) <http://www.msip.go.kr/>
- [23] Kementerian Komunikasi dan Informasi <http://www.kominfo.co.id/>

Parental Awareness on Teenage Smoking Behavior in Yogyakarta and Bali

¹ Lucky Herawati

Health Polytechnic Yogyakarta
Health Department of Republic Indonesia
Yogyakarta, Indonesia
E-mail: Dok031204@yahoo.co.id

ABSTRACT

Smoking or being healthy is not a suitable offers to young teenagers (ages 13-15 years), because they have not able to take responsibility for the negative impacts of their choices on smoking behaviors. In addition, they have not been well informed about cigarettes and their dangers. The data indicate that there was a high rate of smoking behavior for adolescents aged 13-15 years (55.71%), including trial smoking behavior. However, only 39% of parents are aware of their children smoking behavior. This study aims were determining the awareness of parents and its form on the smoking behavior of their teenage children after treatment.

The design of this study was a pre-posttest experiment with control group design. Around 301 parents of 8th grade boy student from 7 junior high schools were considered respondents. The latter came from 2 locations namely Yogyakarta and Tabanan Bali. For determining the respondents, cluster random sampling was used. The respondents were grouped into 3 groups (X_1 treatment group, X_2 treatment group and control group). The treatment is to provide information about cigarettes and its danger. It was given once by health workers. The measured variable is the respondent awareness and its form that was obtained from the students using self-reported questionnaire. Data were analyzed using Kruskal Wallis and Chi-square test with 0.05 level of significant.

The results showed that there was a significant increase the parental awareness after treatment (p value 0.0001). This can happen because the intervention strengthened the predisposing factor to realize the respondents' caring behavior as well as the concept of behavioral determinant of LW Green. In the X_2 treatment group (non-smoker respondents) showed a higher increase of parental awareness than X_1 treatment group (smoker respondents) and control group. This happens because they get support from health workers and get healthy conditions as resulted from their behavior. They will continue to remain as nonsmokers and encourage their teenage children to look up to them in order to get a similar reward, as the law of effect theory by E.L Thorndike made it clear. The form of awareness that many parents chose is the message upholding the primary prevention. The conclusion of the research stresses on continuously fetching more knowledge about cigarettes and its dangers, as one of the best mechanisms that can increase the parental awareness against teenage smoking behavior.

Keywords: awareness, parent, smoking, teenagers

I. BACKGROUND

Smoking or being healthy is a decision that must be chosen by individuals who already have enough information about cigarettes and the dangers and been able to responsible for the risk of their choice. The offer is not appropriate for teenage (ages 13-15 years), because they have not fully received sufficient information about smoking and its dangerous. They still need parental involvement to get cigarettes. According to Bennet & Murphy (1997) in Astuti (2012), adolescent smokers in general will also potentially be predictors of a number of other social problems namely unhealthy sex behavior, school dropout and juvenile delinquency [1]. Especially for poor families, teenage smoking behavior caused diversion needs for fulfill food, education and health for families. The earlier teenage know cigarettes, the longer the burden of the family as the consequences of teenage smoking behavior. They will "share" consciously or unconsciously negative impact on the environment and their family [1].

Data showed that there was an increasing percentage of teenage smoker from year to year. In 2012 there were 50% teenage smokers including trial smokers of students grade 7-9 of junior high school (between 13 to 15 years) in Bantul regency, Yogyakarta special area in Indonesia [1], in 2015 there were 29.3% teenage smokers of 7th grade students of junior high school (between 13-14 years) in Jayapura city in Indonesia [2], in 2016, there was 55.71% of male teenage smokers (before intervention) of 8th grade students of junior high school (between 14-15 years) in three cities in Indonesia namely Yogyakarta, Tabanan Bali and Banjarmasin [3]; although most of the schools in Indonesia have implemented a "smokeless school" policy. The national average number of cigarettes smoked per day (for population more than 10 years) was 12.3 cigarettes [4]. According to Shiffman in Zhu, Sun, Hawkins, Pierce, & Cummings (2003), this number was not low [5]. However, only 39 % of parents have known their teens' smoking behaviors [6].

According to Barner (1990) in Binder (2010), the magnitude of the percentage of teenage smoking behavior related to life in his family [7]. The link between family life and teenage smoking behavior, Shamsudin (2000) and

Gwon (2016) confirmed that parental smoking behavior was one of the factors that significantly influence teenage smoking behavior [8] [9]. Without ignoring the efforts of previous researchers to intervene teenage smoking behavior among others through peer and mentor [10] [11] [12], researchers want to complement these efforts by empowering parents namely the father both smokers and non-smokers.

The consideration choosing parent (father) for intervention was they must be responsible for the teenage behavior. Besides, father as role model of their child behavior as the Bandura's social learning theory expressed by Andrew (1993) in Binder (2010) [7]. Their father together with peers, mentors and their teachers were reinforcing factor as the concept of determinant behavior by LW Green [13] [14]. On the other hand, teenagers also recognize the authority of their parents to remind them, especially in the case of smoking and drinking alcohol [15].

Because of the high number of unknowing parent to their teenage behavior have linked to lack of communication between teenagers and their parents [16], so this study want to add information about cigarettes and its dangers to their parents. Moreover, their parent will be motivated to aware on teenage smoking behavior.

II. METHOD

This research was an experimental research, pretest-posttest with control group design, using 3 research groups, consisted of 2 treatment groups and 1 control group. The respondents were 301 parents of the 8th grade boys of 7 junior high schools. The parent of the boy students were chosen as respondent with consideration that smoking behavior done by mostly male student. Astuti (2012) did not find the smoking female student of the 8th grade of junior high school in Bantul Regency ⁽¹⁾. The seven junior high schools were chosen by cluster random sampling from a number of government junior high schools in Yogyakarta and Tabanan Bali. The selection of the two locations (Yogyakarta and Tabanan Bali), were based on the proportion of the lowest national number of smokers by province in Indonesia in 2013⁽⁴⁾, with assuming that these provinces lack of the national program priority.

The independent variable (kind of treatment) was giving information about cigarette and its danger to respondent both smokers and nonsmoker parents. The information was given once in a day by the health worker. There were 104 smoker parents called X₁ treatment group and there were 98 nonsmoker parents called X₂ treatment group. There were 99 parents that did not receive

treatment, called control group. The dependent variables were parental awareness on teenage smoking behavior and its forms. Respondent's awareness is the activity of communication between respondents and their teenage related to smoking behavior. Two months later, parental awareness and its form were measured on students using self-reported questionnaire. If there was communication between parent and their children, although just once in 2 months, it would be noted as respondent aware. If the student gave information that there was no communication between respondent and their child related to smoking behavior, it would be noted as respondent un-aware. The parental awareness forms were grouped into 3 prevention message forms, namely primary, secondary, and tertiary prevention message forms [17]. The primary prevention message form consisted of 3 options e. i explaining about cigarettes and its dangers, avoiding friends who are smoker, and recommending for not to smoke. The secondary prevention message form consisted of 2 options e. i reminding to reduce the number of cigarettes smoked per day and reminding to stop smoking. The tertiary prevention message form consisted of 2 options e. i hearing children's problems and solving children's problems.

Data were analyzed using Kruskal Wallis and Chi-square tests with 0.05 level of significance. This research got recommendation from the Ethics Committee of Faculty of Medicine and Health University of Muhammadiyah Yogyakarta in 2016.

III. RESULT

A. Characteristics of Respondent

In average, the respondents were 46 years old (the youngest was 46 years old and the oldest was 65 years old). Most of the type of work parent was entrepreneurs and laborers. There was no different type of work parent between respondent in one group and another (p value 0.796 or more than 0.05). More can be seen in Table 1.

B. Respondent' Awareness

The data showed that there were an increased number of respondents who aware to children smoking behavior after the treatment in the X₁ and X₂ treatment groups, whereas in the control group actually decreased. The highest percentage rate of increasing occurred in the respondents of the X₂ treatment group e. i non-smokers respondents. Kruskal Wallis test showed that there were a significant difference in percentage rate of respondent awareness between one group and another (p value 0.0001 or less than 0.05). More can be seen in Table 2.

TABLE 1. CHARACTERISTICS OF WORK RESPONDENT

| Type of work | Experiment groups | | Control group n=99 (%) | Total n=301 (%) | P value ^a |
|-------------------|--------------------|-------------------|------------------------------|-----------------------|----------------------|
| | X1 n=104 (%) | X2 n=98 (%) | | | |
| Civil servants | 6.7 | 18.4 | 13.1 | 12.6 | 0.796 ^b |
| Armed forces | 0 | 0 | 4.0 | 1.3 | |
| Private employees | 30.8 | 22.4 | 20.2 | 24.6 | |
| Entrepreneurs | 32.7 | 27.6 | 29.3 | 29.9 | |
| Retired | 0 | 0 | 4.0 | 1.3 | |
| Laborer, etc | 29.8 | 31.6 | 29.3 | 30.2 | |

^a Kruskal Wallis test, ^b level of significant 0,05

TABLE 2. PERCENTAGE OF RESPONDENT AWARENESS BEFORE AND AFTER TREATMENT

| Group | % rate of responden awareness related to teenage smoking behavior | | | | Gain (%) | P value _a |
|-------------------------|---|----------|-----------------|----------|----------|----------------------|
| | Before treatment | | After treatment | | | |
| | Aware | Un-aware | aware | Un-aware | | |
| X ₁ n=104 | 61.5 | 38.5 | 78.8 | 21.2 | 17.3 | 0.0001 ^b |
| X2 n=98 | 76.5 | 23.5 | 85.7 | 14.3 | 9.18 | |
| Kontrol n=99 | 80.8 | 19.2 | 68.7 | 31.1 | -12.12 | |

^a Kruskal Wallis test, ^b level of significant 0.05

C. Relationship Between Type of Work and Parental Awareness

There were 6 types of respondent's work. We assumed that there were relationship between type of work and parental awareness related to teenage smoking behavior. However, there were no significant relationship between different types of work and parental awareness both before and after treatment (p value 0.605 and p value 0.993 or > 0.05). More can be seen in Table 3.

TABLE 3. RELATIONSHIP BETWEEN TYPE OF WORK AND PARENTAL AWARENESS

| Type of work | Before treatment | | | After treatment | | |
|----------------------|--------------------|----------|-----|--------------------|----------|-----|
| | Aware | Un-aware | Σ | Aware | Un-aware | Σ |
| A | 28 | 10 | 38 | 32 | 6 | 38 |
| B | 3 | 1 | 4 | 3 | 1 | 4 |
| C | 58 | 16 | 74 | 58 | 16 | 74 |
| D | 63 | 27 | 90 | 69 | 21 | 90 |
| E | 4 | 0 | 4 | 3 | 1 | 4 |
| F | 63 | 28 | 91 | 69 | 22 | 91 |
| Σ | 219 | 82 | 301 | 234 | 67 | 301 |
| P Value ^a | 0,605 ^b | | | 0,993 ^b | | |

^a Chi-Square test, ^b Level of significant 0,05

A=Civil Servant, B = Armed Forces, C= Private Employees, D= Entrepreneur, E= Retired, F=Laborer, etc

D. Form of Parental Awareness

Parental awareness related to teenage smoking behaviors was grouped into 3 prevention forms. Primary prevention form, preferably for non-smoker teenagers, secondary prevention form, preferable for smoker teenagers, and tertiary prevention form, preferable for smoker teenagers who need a companion.

The description of respondents' concern on their adolescent smoking behavior indicated that respondents of X₂ treatment group (non-smokers) had higher percentage number than others in all prevention forms.

Overall, respondent in all group tended to choose primary prevention form especially giving information about cigarette and its danger compared with secondary and tertiary prevention forms. In the primary prevention form, respondent in all groups tended to choose "suggest not to smoke" compared with the others. In the secondary prevention form, respondent nonsmoker (X₂ treatment group) and control group tended to choose "advocate quitting smoking" compared with the other one. The smoker respondent (X₁ treatment group) tended to choose "advocate to reduce number of

cigarette” compared with the others. In tertiary prevention form, respondent in all group tended to choose “hear teenage problem” compare with the other one. More can be seen in Table 4.

TABLE 4. PARENTAL AWARENESS FORM RELATED TO TEENAGE SMOKING BEHAVIOR

| Awareness Form | Smoker parent (X ₁) n=104 | | Un-smoker parent (X ₂) n=98 | | Control | | Average |
|---------------------------|---------------------------------------|------|---|------|---------|------|---------|
| | f | % | F | % | f | % | % |
| Primary Prevention Form | | | | | | | |
| A | 66 | 57.7 | 83 | 84.7 | 63 | 63.6 | 68.66 |
| B | 35 | 23.7 | 59 | 60.2 | 42 | 42.4 | 42.1 |
| C | 65 | 62.5 | 76 | 77.6 | 70 | 70.7 | 70.26 |
| Secondary Prevention Form | | | | | | | |
| D | 16 | 15.4 | 24 | 24.5 | 10 | 10.1 | 16.66 |
| E | 15 | 14.4 | 26 | 26.5 | 24 | 24.2 | 21.7 |
| Tertiary Prevention Form | | | | | | | |
| F | 14 | 13,5 | 12 | 12,2 | 12 | 12,1 | 12,6 |
| G | 11 | 10,6 | 9 | 9,2 | 5 | 5,1 | 8,3 |

A= information related to cigarette and its dangers, B= avoid friend who smoker

C= not to smoke, D= reducing cigarettes smoked per day, E= quit smoking, F= Hearing teenage problem, G= Solving teenage problem

IV. DISCUSSION

The addition of information about the content of cigarettes and its danger to parents affected on parental awareness related to teenage smoking behavior. According to concept of behavioral determinant stated by LW Green, that one determinant of one's behavior is predisposing factor including knowledge [13]. Intervention in this study will strengthen the predisposing factor in parents. It will gradually cause parental awareness related to teenage smoking behavior.

Although respondents in all groups tend to choose primary prevention forms, especially explaining about cigarettes and the danger, but the highest percentage is in non-smoker respondents. This can be explained by The Law of Effect theory of E.L Thorndike in Mazur, J.E. (2013),

"reinforcing and punishing are used differently in psychology than they are colloquially. Something that reinforces a behavior makes it more likely that that behavior will occur again, and something that punishes a

behavior makes it less likely that behavior will occur again “

It means that behaviors that produce pleasant rewards will be repeated, whereas if behavior brings punishment then the behavior will not be repeated again ⁽¹⁸⁾. The nonsmoker parents feel that what they have done is the right way. They have succeed to refuse cigarettes and got a good health. They will continue their behavior (not to smoke) and they want their child imitated them in order to have a good health. So, that's way the percentage number of increasing parental awareness higher than the other groups.

In this study showed no relationship between the different types of work with the concern of parents to teenage smoking behavior. It means that any type of work has the same concern. This can be explained because any type of work has limited time to make communication with their teenage children.

The most commonly form of parental awareness chosen by respondent is primary prevention form, especially “giving information about cigarette and the danger. This is because the material refreshing is about the content of cigarettes and the danger. The newly material is still remembered and delivered to the teenager.

The second prevention form chosen by respondent is secondary prevention form especially advice to quit smoking. So, weather primary prevention form and secondary prevention form are “cigarette and the danger” theme. According to Jackson (2002) in his research produced information that adolescents recognize the authority of parents to remind their behavior related to cigarette and alcohol issues. These issues are more acceptable than conventional issues (about learning and worship) and contemporary issues (about choosing friends, music, and dressed)[2].

V. CONCLUSION AND RECOMMENDATION

Adding information to parent about cigarettes and the dangers can significantly increasing the parental awareness related to teenage smoking behavior. In addition, there was no relationship between type of parent work and parental awareness. The form of parental awareness that prefer to choose was primary prevention form especially “explaining about cigarettes and the dangers”. The result of this research can applied to parent especially parent of the 8th grade boy students of primary high school in Yogyakarta and Bali, in order to control the percentage number of teenage smokers.

REFERENCES

- [1] Astuti K. Discription about Smoking Behavior In Teens in Bantul. Insight. 2012;10(1):77–87.

- [2] Herawati, L; Arif Budiman, J; Haryono, W; Mulyani W. Jayapura Teenagers Smoking Behaviour. *J Community Heal*. 2017;42(1).
- [3] Herawati, L; Arief Budiman, J; Hadi, Choirul ; Khair A. Parent educator for teenage smoking behaviour. *Int J Adolesc Med Heal*. 2017; in press
- [4] Kesehatan K. Penyajian Pokok-pokok Hasil Riskesdas 2013. Jakarta; 2013.
- [5] Zhu, Shu-Hong; Sun, Jichao; Hawkins, Sally; Pierce, John; Cummins S. A population study of low-rate smokers: Quitting history and instability over time. *Heal Psychol*. 2003;22(3):245–52.
- [6] Williams RJ, McDermitt LD DR. PARENTAL AWARENESS OF ADOLESCENT SUBSTANCE US. *Addict Behav* [Internet]. 2003;28(4):803–9. Available from: <https://www.uleth.ca/dspace/bitstream/handle/10133/413/Parental?sequence=1>
- [7] Binder J. Adolescent Alcohol Use in Relationship to Parental Perceptions on Underage Drinking: A Literature Review. The Graduate School University of Wisconsin-Stout Menomonie, WI. 2010.
- [8] K Shamsuddin MAH. Family Influence on Current Smoking Habits Among Secondary School Children in Kota Bharu Kelantan. *Singapore Med J*. 2000;4(4):167–71.
- [9] Gwon SH JS. Factors Influencing Adolescent Lifetime Smoking and Current Smoking in South Korea: Using data from the 10th (2014) Korea Youth Risk Behaviour Web-Based Survey. *J Korean Acad Nurs*. 2016;46(4):552–61.
- [10] Thomas, R.E., Lorenzetti, D., Spragins W. Mentoring adolescent to prevent drug and alcohol use. *PubMed*. 2011;9.
- [11] Clair, J PO. Mentor, the drug and alcohol protection charity [Internet]. 74 Great Eastern Street, London, EC2A,3JG; 2009. Available from: <http://www.mentoruk.org.uk/wp-content/upload/211/11/Prevention-Evidence-Paper-Nov-11-Final.pdf>
- [12] Walker., Ann, S. M. Common reasons why peer education fails. *ERIC*. 1999;22(4):573–7.
- [13] Green, LW., Ottoson J. A Frame for planing ang evaluation: precede-procede evolution and application of the model. In: *ans journees de sante publique*. 10th ed. Montreal, Quebec; 2006.
- [14] Green, Lawrence W; Kreuter MW. Health promotion planing an educational and environmental approach. second. Toronto London: Mayfield Publishing Company; 1991. 223 p.
- [15] Jackson C. Perceived legitimacy of parental authority and tobacco and alcohol use during early adolescence. *J Adolesc Heal* [Internet]. 2002;31(5):425–32. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12401429>
- [16] Williams R. Parental awereness of adolescent substance use. *Addict Behav*. 2003;28(4):803–9.
- [17] Badan Narkotika Nasional. Pencegahan penyalahgunaan narkoba. Badan Narkotika Nasional. Jakarta: Pusat Pencegahan Lakhar; 2009.
- [18] Mazur J. Basic Principles of Operant Conditioning." *Learning and Behavior*. 7th ed. 2013. 101–126 p.

Undergraduate nursing students' experience using the combination of Flipped Classroom and Jigsaw strategy

¹ Maria Silvana Dhawo, ² Chrisnawati, and ³ Imelda I.Ladjar STIKES Suaka Insan

Banjarmasin, Indonesia

E-mail: ¹ mariadhawo@gmail.com, ² Yudhachrist16@gmail.com, ³ imeldaladjar@gmail.com

ABSTRACT

STIKES Suaka Insan Banjarmasin has been using the technique of Aronson Jigsaw as a cooperative learning by combining it together with flipped learning since the last semester. Earlier work by one of the authors suggested that Nursing students' in STIKES Suaka Insan had lack of ability in terms of independent learning and did not enjoy their studying in the large group setting. Some publication revealed that Jigsaw strategy consider to enhance cooperative learning by making each student focus on particular topic and be more responsible towards the learning outcome. In support of the implementation of Jigsaw, flipped learning has a strength to present the new environment for the millennial. Hence, by combining flipped learning and jigsaw strategy (FLJ) approach will provide an opportunity for the students to become more independent and ready to answer the challenges for 21st century Nursing Education. The aims of this study were to determine the effectiveness of FLJ on students' independent learning and determine the combination of FLJ trends among nursing students at STIKES Suaka Insan Banjarmasin.

This study combined experimental and descriptive qualitative research design, participated 2 groups who were divided by randomization process totaling 64 students; 32 students in control group (interactive lecture) and 32 students in the experimental group (combination of flipped classroom and jigsaw strategy). The study administered 21 agreement statements regarding independent learning among two groups and it was analyzed using mann-whitney u test. In addition to quantitative approach it is also important that the study gives attention on the trends of flipped classroom and jigsaw strategy based on students' perspective. Hence, 20 students in the experimental group were asked to join in focus group discussion (FGD). All the data in FGD were analyzed by content analysis.

Mean Score for the control group was at 63.74 and mean score for the experimental group was at 72.56. The qualitative analysis revealed some characteristic of the learners who joined in FGD. It also showed the factors affecting their learning in FLJ which includes time, facilities specifically rooms and types of co-learners within their class.

Findings revealed that the students in the experimental group gained higher score in their independent learning than the students in the control group. It indicated that teachers' adoption of FJL for students' learning activities is helpful for students to improve their independent learning. The findings provided the option for the nurse educators in STIKES Suaka Insan to develop FLJ by implementing its strategy and provide the nursing students to become more independent towards the learning outcome.

Keywords: Interactive lecture, Combination of flipped classroom and jigsaw strategy, Independent learning, Trends of flipped classroom and jigsaw strategy.

I. INTRODUCTION

In response to the global call for transformative education for health professionals for the 21st century, Indonesia has developed a new curriculum for Nursing Education. Professional nursing education in Indonesia has undergone major changes over the past decade. The curriculum was developed into an integrated program to improve students' knowledge, attitudes, and skills in dealing with the country's health problems. The purpose of the integrated structured curriculum is to mold the nursing students to become independent learners and thus become independent professionals; who are not only capable to solve problems, but be able to become the agents of change [1]. Instilling independence to the nursing students will pave the way to encourage them to be more responsible for their own

learning. Therefore, the teaching and learning strategy is being shifted from teacher-centered into student-centered education [2]. Sekolah Tinggi Ilmu Kesehatan (STIKES) Suaka Insan Banjarmasin in South of Borneo is one of the nursing schools in Indonesia. It provides 2 nursing programs; Diploma of Nursing and Bachelor of Nursing. The vision for the Bachelor of Nursing program is to provide excellent professional nurses in South of Borneo who are knowledgeable in medical-surgical nursing by educating them in global perspectives and caring practitioner equipped with fundamentals of nursing. This vision motivates the BS Nursing program to ensure the quality of nursing education, especially in medical-surgical area by improving teaching and learning method which is appropriate for the millennia

STIKES Suaka Insan Banjarmasin has been using the technique of Aronson Jigsaw as a cooperative learning to replace the role of interactive lecture as an ultimate method in teaching medical surgical nursing course. Earlier work by one of the authors suggested that Nursing students' in STIKES Suaka Insan had lack of ability in terms of independent learning and did not enjoy their studying in the large group setting which was done by interactive lecture. Some publication revealed that Jigsaw strategy consider to enhance cooperative learning by making each student focus on particular topic and be more responsible towards the learning outcome. By focusing on a particular content of the course, Jigsaw strategy could increase the ability of the students to communicate, develop the critical thinking skill, and problem solving skills [3]. Those competences are expected to be achieved by nursing students in recent year. In support of the implementation of Jigsaw, flipped learning has a strength to present the new environment for the millennial. Hence, by combining flipped learning and jigsaw strategy (FLJ) approach will provide an opportunity for the students to become independent and ready to answer the challenges for 21 century Nursing Education.

Many nurse educators in STIKES Suaka Insan do not fully realize the positive effect of FLJ among nursing students because of lack of references, personal experience, and personal evidence to apply said teaching method. Hence, the result of the study provided justification to apply new teaching method by showing the positive impact for the millennial and the Information obtained from this study can be used as a parameter and standard in applying the FLJ approach in their actual classes.

II. RESEARCH QUESTIONS

1. How do student independent learning differ after using two teaching approaches, namely interactive lecture and FLJ?
2. How do nursing students perceive the trends of FLJ after experienced that teaching approach?

III. REVIEW OF RELATED LITERATURE

A. Interactive Lecture

The lecture is the most common method in teaching adult learners [2]. Many teachers could not remove lecture from their teaching activity. They reform their instructional style from traditional lecture to active learning in order to address students centered learning; they engage the students within group projects, discovery activities, experiments, and class presentation. Steiner et al explained interactive lecture as the lecture in which involves the participation of

students in the content of a lecture for the specific subject matter. Thus, the students are no longer passive during the learning process. Interactive lecture raises the higher order thinking. It can facilitate problem solving, decision-making, and enhance the communication skills. There are some approaches which the teacher can apply to help the students learn during the lecture process [5]: 1) Utilize the real examples to explain the abstract context of your lecture; 2) Provide the handout of the overview content, completed chart with enough space for taking a note and enumerate what the outcomes of the lecture session; 3) During the explanation time, give a time for "pausing" thus the students could have enough time to take a note; 4) Ask the questions to measure the level of students' understanding. Questioning is the key aspect in the interactive lecture. By addressing the question based on the objective of the lecture, could promote students' ability in analyzing, synthesizing, and evaluating.

Students learn well by "doing". During Interactive lecture, The teacher insert some various methods to encourage students to be more active in the learning process. Such as; brainstorming and buzz groups [6]. Brainstorming is a technique for encouraging the 'comprehension of an issue or topic. The teacher invites answer to a question or issue for the students and writes them on a board or other media without comment. Then, the teacher reviews the list of "answer" with the students. The answer could become the topic for the next lecture. This technique allows the students to learn from each other [7]. Buzz group refers to the activity of getting students to process and use new information to solve the problems. It encourages interaction between two to five students who working in a group for five minutes on a question, problem, or exercise set by the teacher.

B. Jigsaw Strategy

Jigsaw strategy was developed by Elliot Aronson. The ability of the groups' formation to resolve the task is the one of the goals in jigsaw strategy. The home groups allocate one member to each expert or research group to gather data to bring back to the home group [3]. To Implement the Jigsaw:

- Divide the material needed to cover a topic into four roughly equal parts. In upper division or graduate classes, you might assign four different articles. In introductory level classes you might need to assign four different sections of a chapter or four abridged articles. Finding four equal parts is sometimes tougher than it seems.
- Assign a different topic to each team member. You make assignment: for examples, all #1's will read the article by Johnson & John, all the #2's will read the article by Kagan, all the #3's will read the article by Milis, and all the 4's will read the article by Davidson.

- Develop and assign homework questions or essay over the material. These can be turned in for points or a grade in undergraduate classes. Jigsaw falls apart if students are not prepared. Assigning questioning, reading logs, study guides or reaction papers helps to ensure preparation. You may write different questions for each article or you may simply ask for a summary. In small classes some faculty just check off students' work as they come in. Other faculty grade and/or response to the assignment.
- When class meets again, students consult with expert from other teams. When students arrive in class, they turn in their homework and then meet in expert groups. If you have a large class, you will have to have more than one expert group for each article: you don't want eight people in one expert group. Give the expert group instructions on their task.
- Experts return to their teams and teach. When students return to their base teams, have each team teach in the same order. This way, if a team's 2 is absent, team members can disperse and sit with the teams next to them when it's time for the #2s' to teach. If they all teach on their own schedule, you can't compensate for absences.
- Team synthesis activity. Try to design an activity that will synthesize the information that students learned in the four articles. They might analyze a case, write a team essay or position paper or solve a problem.

The jigsaw structure is somewhat complex. It may be best suited for when the students are comfortable with group work. There are high expectation and responsibilities placed on the students. Teaching the students in the original group can be a demanding experience for students. This can be mitigated if the jigsaw structure is altered so two group members share the same section and then join with another pair of students. If the sections are more open-ended so there is no single right answer, or if students are encouraged take notes during the focus groups to provide a support when the original groups re-assembles [8].

The core competencies in Jigsaw strategy (Excellence, 2007):

- Writing, speaking and or other forms of self-expression
- Information gathering, such as the use of the library, computer/electronic resources, and experimentation or observation.
- Synthesis and analysis in problem solving and critical thinking including where appropriate, the application of reasoning and interpretive methods, and quantitative thinking.
- Collaborative learning and teamwork.
- Activities that promotes and advance intercultural and/or international understanding.
- Activities that promote the understanding of issues pertaining to social behavior, scholarly conduct, and community responsibility.
- A significant alternative competency for active learning designed for and appropriate to a specific course.

C. Flipped Classroom

Development of science and technology, especially with the advent of the internet paved the way for introduction of a number of teaching strategies for innovative learning. One of the new teaching methods for millennium students is a flipped classroom. This refers to a class where the teaching process and the assignment have been flipped over [9]. Commonly, teaching process and the information giving occur during class time and students will accomplish their assignment at home. In flipped classroom, the information and the direction will be given at home through video lectures, reading materials, or other instructional delivery methods. Then, students will work on the assignments in the classroom setting. A flipped classroom improves the innovative teaching strategy in the sense that it increases the students' involvement in class discussion, be their own master to accomplish the problem, find the solution, and enable them to engage in inquiry-based learning, and project-based learning [10].

The combination of the behaviorist and constructivism learning theory in a flipped classroom is described in the tenets presented on the following table. A flipped classroom is a combination of the behaviorist and constructivist learning theories [11]. The behavioral theory emphasizes on the teacher as the center of instruction in the teaching - learning process. The teachers still have control of the content including lectures and tutorials. The constructivist in a flipped classroom reflects the role of experience to develop the knowledge and create meaning. Students have a special role to participate and be active in the lecture content. The teachers collaborate with the students to understand the course concepts. The students learn in a social environment with classmates and get exposed through the information, feedback, and perspective from the other students.

The literature review published by Flipped Learning Network (FLN) in 2014 explained the four pillars of a flipped classroom. The component of the pillars describes the things which the teacher should affiliate to employ the flipped classroom, including (1) flexible environment, (2) learning culture, (3) intentional content, and (4) professional educator to engage the students in that process. Flexible environment refers to providing a new approach for the students to learning the specific material and achieve mastery learning.

Promoting a learning culture means a providing an opportunity where the teachers are not the center of the teaching process by engaging the students in meaningful activities. The teacher should organize the relevant learning content and consider the accessibility to all the students in realizing the intentional content. As a professional educator, teachers should maximize students' evaluation by observing them during the classroom schedule and recording data for a future flipped class improvement.

Lipton (2014) [12] in alchemy learning listed some steps to implementing a flipped classroom:

- Starting with a video maker of a lecture or lesson, providing reading materials, other learning resources or string together multiple online and digital resources into a lesson.
- Sharing the video or learning materials with the students through online system.
- Asking the students to access the learning materials at home or another possible place to study.
- Spend the class time differently and utilize it for meaningful activities.

The main principle in a flipped classroom is the students have accessed the learning material before they enter the class in order to ensure they are ready for meaningful activity during the class schedule. For many years, so many students attended the class without any preparation, and that served as the main impetus to flip the classroom.

D. Study on Jigsaw strategy and Flipped Classroom

Missildine, Fountain, Summers, and Gosselin (2013) examined the effect of a flipped classroom and innovative learning activities on academic success and the satisfaction of a nursing student. The study found that the examination scores were higher for the flipped classroom, however the students were less satisfied with a flipped classroom method than the previous method (lecture). Flipped classroom has a positive impact and experience for both faculty and the students. Students come to class ready to actively engage in collaborative learning through the use of case scenario, small group discussion, and other interactive activities. Because the nurse educators do not spend the entire class period lecturing, they have more time to facilitate in-depth discussion of class content and other active learning strategies.

A flipped classroom format supports creativity and charges the students with taking responsibility for their own learning by applying independent learning. In a flipped classroom, the significant role of motivation and demonstration of a greater awareness of the students' responsibility in making learning meaningful and monitoring themselves are the basic indicators of independent learning [13].

Another study was conducted by Goda, Yamada, Hata, Matsukawa, and Yasunami (2016) examined the effect of flipped jigsaw collaborative learning on English as a foreign language learning (EFL) anxiety. The result showed that EFL learning anxiety items related to course preparation demonstrated significant changes following the flipped jigsaw activities. This implies that flipped jigsaw collaborative learning activities may promote learners' outside-the-classroom preparation, and that such preparation may lead to better performance and leaning anxiety reduction [14].

IV. METHODOLOGY

This study combined experimental and descriptive qualitative research design. Specifically, a randomized post-test only control group design was used to determine the effectiveness of the two strategies. The descriptive qualitative research design was also used to compliment the experiment. participated 2 groups who were divided by randomization process totaling 64 students; 32 students in control group (interactive lecture) and 32 students in the experimental group (combination of flipped classroom and jigsaw strategy). In addition to quantitative approach it is also important that the study gives attention on the trends of flipped classroom and jigsaw strategy based on students' perspective. Hence, 20 students in the experimental group were asked to join in focus group discussion (FGD). The research took place at STIKES Suaka Insan Banjarmasin, Indonesia. The subject of this study came from BS Nursing Student level III, who took the renal system course. Renal system is a crucial course for BS Nursing students. The load of this course is 3 units, and taught in a block schedule for 5 weeks. During the last week, the course coordinator arranged it as a schedule for make-up class. The researcher utilized the make-up class to conduct this study. This study was divided into three phases. The first phase refers to the preparation stage where the researcher completed the instructional module for the lesson, video, and the survey that were used for the study. The implementation consisted of 5 sessions; 4 sessions will be employed for teaching and learning (experiment process/second phase) and the last session for data gathering (third phase).

The survey questionnaire for independent learning was adopted from Sumartiningsih (2015) [15]. The survey questionnaire emphasized the development of a flipped learning for BS Nursing Students in University of Pelita Harapan, Indonesia. The tool has been confirmed as reliable with the value of Chronbach's alpha was 0.78 for Independent learning and 0.87 for Critical Thinking Skill. It completed with the ethical clearance from Mein Mochtar Riady Institute International ethic committee in Malaysia. The Survey for Independent learning focused on three major themes including what the students actually did for class preparation (Item number 1-10), during the class

activity (Item number 11-17), and after class activity (Item number 18-21). The guide questions used in the focus group discussion (FGD) was based on the Small Group Learning written by Cristina Mencias, PhD. The questions were formulated and pondered by the researchers. These questions were later committed to memory by the researcher assigned to be the chairman or the moderator of the discussion. For accurate recording, two cellphones were used during the entire proceedings, one served as a backup, in case there will be failure of recording to the whole process.

Independent Learning on the control group and experimental group were analyzed using Mann-Whitney Test because both data were ordinal. Test (intergroup comparison) and % gain scores were compared using a p value less than 0.05 to be considered significant. For qualitative analysis, all responses of students were coded into common themes that emerged. Themes were drawn from multiple responses per questions. Then, responses that have more than one student's answer in a similar way were counted as a percentage. The researcher coded answers as variations if the response was unique and different.

V. RESULT

A. Competency of students to demonstrate independent learning

Table 1 presents the distribution of students according to their responses in the survey on independent learning. The survey was conducted right after the implementation of the study during the evaluation phase. There were 21 statements regarding independent learning using Likert scale. Ratings ranged from 4: strongly agree to 1: strongly disagree and the highest favored score was 84 points. The mean score for interactive lecture was 63.74 and that of the FLJ was 72.56. The latter exceeds the passing rate indicating the higher propensity of those in the FLJ group to practice independent learning.

Their difference has been tested using Mann Whitney U Test. Obtained values showed a significant difference between students' independent learning in interactive lecture and in FLJ with p-value $0.000 < 0.05$. This result proved that responses students were statistically different from each other. Students appreciated the opportunities given to them to engage in practicing their autonomy and this is consistent with the competence required of professionals in the 21st century transformative learning. By becoming the independent learner, the students are expected in promoting a meaningful change for future nursing profession in Indonesia [1].

TABLE I. COMPARISON OF STUDENTS' PERCEPTIONS ON INDEPENDENT LEARNING BASED ON TWO TEACHING STRATEGIES USED

| Parameter | Teaching Strategies | |
|--------------|----------------------------------|-------|
| | Interactive Lecture | FLJ |
| Mean Rank | 63.74 | 72.56 |
| N | 32 | 32 |
| Mann-Whitney | 159.500 | |
| Z-Value | -4.652 | |
| P-Value | 0.000 (significant at $p=0.05$) | |

B. Qualitative Result

The result of Focus Group Discussion (FGD) among 20 students revealed their characteristics as a learner. It also showed the factors affecting their learning in FLJ which includes time, facilities specifically rooms and types of co-learners within their class. These are the characteristics of the learner who joined in FLJ group:

TABLE II. CHARACTERISTICS OF THE LEARNER

| Response | Theme |
|--|----------------------|
| <ul style="list-style-type: none"> "We want a thorough grasp of the strategy." "Reinforcements on the different strategies. At this point, we can still be confused as to the correct implementation of the different strategies." | The Hungry Learner |
| <ul style="list-style-type: none"> The students are more motivated to answer and explain in (Jigsaw strategy). In large group setting (Interactive lecture) you do not have to answer the question from the teacher, perhaps your classmate will help you to deal with it. "I feel more pressure to explain or teach my fellow students in the same group" "As I mentioned earlier, learning is forced so it encourages me to study." | The Pressure Learner |
| <ul style="list-style-type: none"> I enjoyed the class so much. Because the group is small and informal; everyone has their own inputs during and after the reporting. There is much exchange of ideas which you won't experience in larger group. I really enjoy because it is very interactive." "I like how the idea exchange.. We got to know ourselves better as learners. We also know the strengths and weaknesses of ourselves and learn the strengths and | The Social Learner |

| Response | Theme |
|---|----------------------|
| <p>weaknesses of my classmates. Most of the time, we interact with each other and we actively participate.”</p> | |
| <ul style="list-style-type: none"> • “We could get a lot of information, it depends how we adapt it” • “In relation to the case discussions, there are specific cases and then there are expected knowledge that students are supposed to gain, so the teacher has to evaluate those students based on how deep is the research or knowledge they are contributing in the discussion. • “Yes, there is an intervention of the teacher in the discussions made by the students.” | The Filtered Learner |
| <ul style="list-style-type: none"> • “What I can say about the ideas is that they’re connected to one another. Like for example when I say something, immediately there is a follow up statement related to what I’m saying. There are some cases when there are people who have different ideas but then what I like about it is that we all accept each others points of views. It is very peaceful and interrelated.” • “The good thing with that is that the students give their ideas, more or less, they are able to remember a lot of details in the sense that, it’s them who give the information, more than listening to the teacher. During these times, they listen to each other, they can agree with each other. There is no pressure in listening just to the teacher. They can agree to what their classmates are saying and they also contribute.” | The Open Learner |

The following are the responses student made about using the flipped classroom and jigsaw strategy in terms of time:

- “Maybe for me, I need more time, because I should understand the whole of the learning material and everything”.
- We adapt to the time

- “I think the answer to that question depends on how well the teacher facilitates the discussion itself. For example if the teacher knows the time limit well, he or she will be able to really commit to that time limit, whereas if the teacher is not that good, then the discussion will be prolonged. If the time limit is already met, but the discussion is not yet finished, then the topic itself will be compromised”.
- “When it comes to my experience, there is a different moderator who is a volunteer among the students and a facilitator who guides the group. It is the role of the moderator to ask everyone and to summarize in the end. With regards to time table, the moderator is already primed about it, so they are able to finish on time”.
- “So that emphasizes the role of the moderator or teacher- to ensure that the group is right on tract, to keep tract of time”.

There are some common themes to the students’ responses about the room to implement the FLJ strategy:

- “For me, I think it can be improved, the only classroom that we have, is in a letter U, when we are being regrouped.
- “Well specifically, for the classrooms that we use in those subjects, its here in the classrooms, I can say that it’s a good room for small group discussion because of the structure itself. It’s a circle like structure so everyone can see one another and nobody will feel secluded when having discussions. And it’s also cold and very well lit”.
- “Yes. It is very conducive for discussion”.
- “I think I agree with that. All our facilities are designed in such a way that no person’s back is in front of another person so each and everyone can see each other. Everybody can be viewed by the other members of the class. At the same time, resources wise, we have all the equipment like the projector”.

These are the following responses of 20 students regarding their fellow student in the FLJ group:

- “Definitely. As mentioned earlier, the learning in this strategy come from the members themselves. Unlike in a lecture where it is highly dependent on the lecturer, in small group it depends on the members of the group.
- “I agree with what _____ said and what he has mentioned a while ago that in order for a

group discussion to be effective, the members must have prior knowledge to the topic."

VI. DISCUSSION

The students in the experimental group gained higher score in their independent learning than the students in control group. This research showed a consistent result with the study of Missildine, Fountain, Summers, and Gosselin (2013) examined the effect of a flipped classroom and innovative learning activities on academic success and the satisfaction of a nursing student. The study found that the examination scores were higher for the flipped classroom, however the students were less satisfied with a flipped classroom method than the previous method (lecture). Flipped classroom has a positive impact and experience for both faculty and the students. Students come to class ready to actively engage in collaborative learning through the use of case scenario, small group discussion, and other interactive activities. Because the nurse educators do not spend the entire class period lecturing, they have more time to facilitate in-depth discussion of class content and other active learning strategies. The trends of new teaching method, creates a new environment and becomes the benchmark to apply it in other sessions of learning. Because, the learner characteristics, time, and room support its implementation.

VII. CONCLUSION

Findings revealed that the students in the experimental group gained higher score in their independent learning than the students in the control group. It indicated that teachers' adoption of FJL for students' learning activities is helpful for students to improve their independent learning. The findings provided the option for the nurse educators in STIKES Suaka Insan to develop FLJ by implementing its strategy and provide the nursing students to become more independent towards the learning outcome.

REFERENCES

- [1] AIPNI, T. K. (2015). Kurikulum Pendidikan Ners KKN. Jakarta: AIPNI, Indonesia.
- [2] Steinert. (1999). Interactive Lecturing: Strategies for increasing participation in large group presentation. Medical Teacher, Vol.1.
- [3] Aronson. (1997). The Jigsaw Classroom: Building cooperation in the classroom. New York: Longman.
- [4] Cantillon, P. (2003). Teaching Large Group. British Medical Journal, 326 (7386), 437.
- [5] Eldin, Y. K. (2014). Implementing Interactive Nursing Administration lectures and identifying its influence on students' learning gains. Journal of Nursing Education and Practice Vol.4, 107-115.
- [6] A.Sana, E. (2010). Teaching and Learning in The Health Science. Dilliman : University of The Philippines Dillima.
- [7] Clarke, J. (1994). "Pieces of the puzzle : The Jigsaw method" In Sharan, S. (ed), Handbook of cooperative learning methods. Greenwood Press.
- [8] Szparagowski, R. (2014). The Effectiveness of the Flipped Classroom. Honors Projects, 127.
- [9] Bergman. (2012). Flip Your Classroom, Reach every student in every class every day. International Society for technology in education.
- [10] Hawks. (2014). The Flipped Classroom: Now or Never. AANA Journal, 264-269.
- [11] Lipton. (2014). The Alchemy of Authenticity: Transforming Hostility and Avoidance with AEDP. Retrieved March 30, 2016, from Aedp Institute: <https://www.aedpinstitute.org/events/the-alchemy-of-authenticity-transforming-hostility-and-avoidance-with-aedp/>
- [12] Rutkowski. (2014). Flipped Classroom-from experiment to practice. 1st international KES conference on smart technology based education and training (pp. 565-574). Chania: Greece: Springer.
- [13] Goda, Y. Y. (2016). Effect of flipped jigsaw collaborative learning on English as a foreign language learning anxiety. Emerging Technologies for Education 1st International Symposium (pp. 654-664). Rome: Springer Verlag.
- [14] Sumartiningsih. (2015). Menggagas penelitian tindakan kelas: Implikasi flipped classroom learning terhadap kemandirian belajar dan kemampuan berpikir kritis. Karawaci: PT. Internasional Licensing Media.
- [15] Excellence, S. I. (2007). Jigsaw strategy. Penn State: Schreyer Institute for Teaching Excellence
- [16] Missildine, F. S. (2013). Flipping the classroom to improve student performance and satisfaction. Journal of Nursing Education, 52, 597-599.

Akit Tribe and Existence of Mangrove Forest in Berancah Village, Bengkalis, Indonesia

Mita Rosaliza

Sociology Department, Universitas Riau, Pekanbaru, Indonesia

E-mail: mita.rosaliza@lecturer.unri.ac.id

ABSTRACT

Total Area of Mangrove Forest in Berancah Village is about 60 Hectares; 40 Hectares in damaged condition and 20 hectares in good condition. Mangrove forest is utilized by the Akit Tribe who occupies the Berancah Village area, Bantan District of Bengkalis for Panglong Arang industry, by using mangrove wood as raw material of charcoal. Economically Akit Tribe utilizes mangrove forest as a source of livelihood in fulfilling their needs. The majority of Akit people in Bantan District work as mangrove seekers, panglong workers and panglong charcoal owners. This shows that the Akit Tribe's dependence on the mangrove forest is very high, but most people are not paying attention to the sustainability of the forest so that the damage of mangrove forest is quite severe. Socially Akit people use panglong charcoal as a medium of socializing, gathering and sharing information. To meet the economic needs of the Akit community, the utilization of mangrove trees into charcoal has become a hereditary profession from the community of the Akit tribe, its is seen from the continuity of panglong charcoal activity. The social and economical conditions of those Akit people are analyzed using Quasy Qualitatif by interviewing tribe leader (*Batin*) and tribe figure in the Akit tribe. So obtained the meaning of mangrove forest conservation for the Akit and their social balance conditions are maintained.

Keyword: Akit Tribe, *Panglong Arang*, Bengkalis

I. INTRODUCTION

Coastal areas are transitional ecosystems that are affected by land and sea covering several ecosystems. In terms of function, the coastal area is a buffer zone of micro-climate and migratory animals both derived from various species of fish and birds. Mangrove forests, coral reefs and seagrasses contained in the coastal areas serve as: waves penagkis, protect the beach from the dangers of abrasion, breeding place of various types of shrimp, fish and crabs and aquatic biota.

One of the natural resources included in the conservation program is Mangrove forest. This forest as a coastal ecosystem and sea sngat potential for the welfare of the surrounding community both in terms of economic, social and the environment itself. But unfortunately, at this time ketersediannya already increasingly critical. In several coastal areas of Indonesia, there has been a degradation of forests due to logging that exceeds the limits of its sustainability.

Until now there are still many people who do not know how important the mangrove forest in the chain of life in this nature. There are still many who believe that the benefits of mangrove forest is merely as a source of firewood to support their life needs. The complex role in the ecological system of the mangrove forest is

unthinkable.

Factors that encourage human activities to exploit mangrove forests causing mangrove forest destruction include:

The desire to create ponds on large fields in the hope of gaining greater profitability, because technically this is easier and at a relatively cheaper cost.

- A. The need for firewood continues to increase.
- B. Lack of community knowledge of the function of mangrove forests.
- C. The existence of social gap between traditional pond farmers with modern fish farmers so that the process of selling bali land that is not rational anymore.

To reduce human activity in exploiting mangrove forest, it is necessary to do mangrove forest management which have legal force. Given the importance of the role of mangrove for coastal communities, either directly or indirectly, these natural resources must be managed as well as possible. The essence of good mangrove forest management is to provide opportunities for people living around the coast to participate and cooperate with government officials.

Desa Berancah is one of the villages located on the southern coast of Bengkalis. The Berancah Village is not

only occupied by ethnic Malays and Javanese, but China also takes part in this society. Among the diverse ethnic communities in Berancah Village, there is one ethnic that has long been a part of the community that is called Akit Tribe or often referred to as the original. The Akit tribe is located in Bantan District, Berancah Village. This Akit tribe in Berancah Village is only domiciled in one area only and not spread anywhere in the area of Liung River. That is why the Tribe Akit Desa Berancah is called by Orang Asli Liung. With the Akit tribe, the community life is more colorful by the ethnic and cultural diversity of the people, Akit or Akkis, is a social group dwelling in the Long Forest area and on the coast of Bengkalis Regency, Riau Province, called "Akit" given to this Community because Most of their life activities took place on the raft houses. With the rafts they move from one place to another and the river mouth. They also built simple houses on the beaches to be used when they were working on land. In 1984 their number was estimated at about 4500 inhabitants. The Akit people have settled in this area since the past.

Akit people's relationship with other communities around it can be said very rarely. This is supported by their tendency to maintain their identity. Some time ago they were still often classified as an outcast. Residents in the vicinity of many who are less willing to establish a relationship with them, because people akit trusted to have knowledge about black magic and drugs that can be dangerous. Difficulties for relationships caused by the frequent moves, governments and some circles have tried to improve their standard of living, among others, by establishing fixed settlements and teaching farming techniques with modern farming techniques.

Many Akit people who inhabit along the flow of the river Liung, and make the mangrove forest area of Berancah village as a source of life and livelihood for the people of Akit Tribe. They utilize Mangrove forest wood as raw material for charcoal. This is evident from the existence of industrial activity Panglong Arang along the flow of the sungau. This business has long existed and operated within the community of the tribe of Akit from generation to generation. There are 9 Panglong Charcoal Units in Berancah Village. The community of Akit tribe utilize Mangrove forest which has been going on for a long time, also determine the sustainability of mangrove forest area in the future, to make mangrove forest is one of the renewable natural resources.

Therefore it is necessary to do this study, so it is known how the utilization of mangrove forest by Sakai tribe through Panglong charcoal business, Akit community behavior in utilizing mangrove and economic conditions of the community Akit in utilizing the mangrove itself. Seeing the potential of mangrove forests owned by coastal areas in Berancah village, especially the resources of mangrove forest ecosystems. It is necessary to know how Akit tribe utilize mangrove and the existence of mangrove forest itself. The purpose of this study is to analyze the behavior of Akit Tribe people in the utilization of mangrove forest in Berancah village of Bengkalis Regency. And see social and economic conditions of society Akit tribe in the utilization of Mangrove forest in Berancah village. The benefits of this study to determine the level of utilization of mangrove by the Akit tribe that has an impact on environmental damage.

The purpose of this study are :

1. Analyzing the behavior of community Akit and social capital owned by the community in the utilization of mangrove forests in Berancah village
2. Analyzing the socio-economic conditions of the Akit Tribe community.

II. LITERATURE REVIEW

In solving the problems experienced by the Akit Tribe community, systematic and operational efforts are carried out effectively and efficiently. The approach is a synergistic approach with the assumption that the end result of a program is determined by many factors such as financial capital, natural capital, physical capital, personal capital (human), cultural capital, symbolic capital, and social capital itself so that social capital is not the only one [1]. The social capital approach is assumed to mean the word capital itself as a source or capital that can be managed, utilized and optimally utilized. Capital is also seen as a very important thing in the investment process without which it may not work (Coleman, 1988).

The structural aspects, According to Granovetter et. All (in Lawang, 2004: 37) social capital is moored in social structure. Concrete personal relationships and networking relationships that result in trust, expectation and application of norms (Granovetter, 1985). According to Coleman refers to the relationship of actors such as his bond that social capital is inherent in the structure of

relations between actors and between actors (Dasgupta ed, 2002: 16). The definition of structure refers to status and role along with norm concepts, relationships and sanctions of the norm, where this condition is seen as a micro-social structure, then social capital that is tied to macro-social structure lies within the boundaries of relations between community members or between communities.

In epistemology social capital has a sense of capital owned by society in the community empowerment, where there is a mix between something that is material and non material. Material has meaning about ownership related to financial assets while non material, mutual trust and mutual trust system in a society. The concept of social capital provides an emphasis on community togetherness to achieve the goal of improving the quality of life and constantly make changes and adjustments continuously. In the process of change and efforts to achieve the goal, society always tied to the values and norms that guided as a reference to behave, act and behave and relate to other parties.

Some references to values and elements that constitute the spirit of social capital include participatory attitudes, attitudes of mutual care, mutual giving and receiving, mutual trust in trust, and reinforced by the values and norms that support it. Another element that plays an important role is the willingness of the community or group to be continuously pro-active, both in maintaining value, forming networks of cooperation, as well as by the creation of new creations and ideas.

Social capital was originally conceived as a form in which society puts trust in communities and individuals as part of it. They make the rules of collective agreement as a value in their community. Here the aspirations of society are beginning to accommodate, local communities and networks are adapted as a capital of community development and community empowerment. Bourdieu (1986) defines social capital as an actual and potential resource possessed by an individual derived from an institutionalized and continuous social network in the form of recognition and reciprocal introduction (or in other words: membership in a social group) that gives to its various members Form of collective support 2. Coleman (1988) defines social capital as something that has two features, which is an aspect of social structure and facilitates individual action in the social structure. In this sense, social capital forms of obligation and hope, the potential of information, effective norms and

sanctions, the relationship of authority, and social organization that can be used appropriately breeds social contracts.

Putnam (1993) defines social capital as a value of mutual trust between members of society and society against their leaders. Social capital is defined as a social institution that involves networks, norms and social trusts that encourage social collaboration (co-ordination and co-operation) for the common good. It also implies that there is a need for a social networks (networks of civicengagement) or social ties / networks within society, and norms that encourage community productivity. Even further, Putnam loses the meaning of horizontal association, not only giving the desirable outcome but also the undesirable outcome. Fukuyama (1993, 1999) explains social capital to refer to capabilities arising from common beliefs within a society or certain parts of it.

Fukuyama formulates social capital to refer to a set of shared values or norms shared among members of a group that enables the establishment of cooperation between them (in Lawang, 2004). According Fukuyama, social capital contains some aspects of values, there are at least four values are very closely related, namely (1) universalism is the value of understanding of others, appreciation, tolerance and protection of human beings and creatures of God, (2) benevolence Namely the value of the maintenance and improvement of the welfare of others, (3) tradition that is the value that contains appreciation, commitment and acceptance of tradition and traditional cultural ideas, and (4) conformity that is the value associated with self-restraint against encouragement and actions that harm others , As well as security values that contain safety, harmony, stability in dealing with others and self-treating (Ancok, 2003). Lawang (2004) formulated social capital slightly different from that of previous experts.

Social capital refers to all social forces of society constructed by individuals or groups referring to social structures which, according to their judgment, can achieve individual and / or group goals efficiently and effectively with other capital. This definition is described by Lawang in the sociological perspective as follows; Social power refers to all mechanisms already developed by the community in survival. Understanding communities can refer to micro, mezo and macro communities. The social forces as social capital can be confined to the community alone which is seen as

bounded social capital or if it is linked in the form of a network with social capital meso and macro can be called as bridging social capital. If the unit of observation and analysis is meso as bounded then the macro is bridging.

Social capital is essentially social construction, that is, through the social interaction of individuals building social forces (collective) together to overcome social problems faced. Social capital in this sense is the means (means) constructed by individuals reaching a common end.

There is the possibility of social capital dominant in overcoming a social problem but may also not be important. But the synergy principle remains in place so that social capital can be used as a social force to achieve common goals.

Such views on social capital are not contradictory. There is interconnectedness and complementarity as an instrument of social capital appearance analysis in society. By listening to the various understandings of social capital already mentioned above, we can get a broader sense of social capital that is in the form of social networks, or a group of people connected by feelings of sympathy and obligation and by the norm of exchange and civic engagement.

This network can be formed because it comes from the same region, the similarity of political or religious beliefs, genealogical relationships, and others. The social network is organized into an institution that gives special treatment to those formed by the network to gain the social capital of the network. Under these circumstances, the level of the mechanism of social capital can take the form of cooperation.

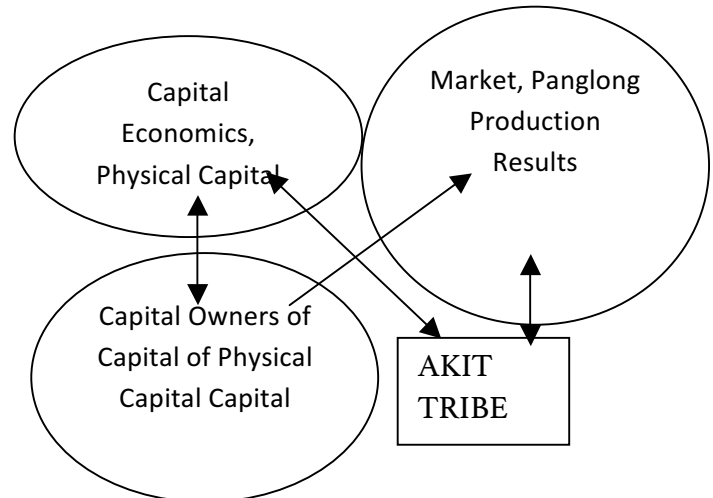
It should be emphasized that an important feature of social capital as a capital, compared with other forms of capital is its social origin, that is, social relations are considered synergy or competition in which one's victory can only be branded above the defeat of another. Furthermore, Woolcock (2001) distinguishes three types of social capital, namely (1) bonding social capital, (2) bridging social capital, and (3) linking social capital. The three types of social capital can work depending on the circumstances. It can work in weaknesses and strengths in a society. It can also be used and used as a supporter and a barrier in social ties so it depends on how individuals and societies interpret it.

A program that is effectively and efficiently operated must have an instrument that leads to the achievement of

objectives by a synergistic approach, assuming that the end result of a program is determined by many factors: financial capital, natural capital, physical capital, personal capital, cultural capital, symbolic capital, capital social. Therefore social capital is not the only one (Lawang, 2004: 62). Economic goals or problem-solving will be achieved if all available capital in society is deployed in a synergy. The synergy principle says that human capital, or physical capital 5, and social capital alone are not enough of itself.

The implementation of the above description is that all existing institutions in society (eg education, family, marriage, religion, economy, market, politics, government, law, etc.) relate to each other in a mutually supportive structural entity Society (societal needs) can be fulfilled. Organizing needs and activities of the community should be cross border (borderless) by forming synergy between activities. Thus the resources (resources) owned by each institution will be used together in order to obtain efficiency and high added value. Because a society has many institutions there should be a way to bring together different peoples' interests in a container, so a positive synergy can be obtained.

Picture 1. Framework



III. METHODOLOGY

This study was conducted in Bengkalis Island, Bantan District with purposive selection because it was adapted to the condition of the subdistrict area which

was inhabited by the majority of the Akit people and generally they were dominated by the people who were livelihood in as the mangrove seeker.

Picture 2 Map of Bengkalis Island



Determination of the subject as a source of information and data in this study, conducted by purposive techniques, namely determination by deliberate on the basis of a particular purpose. A collection of subjects or primary respondents, defined according to the type of information required, and representing the character and phenomena of the community to be observed. Subjects in the interview guidelines that will be encountered consist of formal community leaders, informal community leaders, and the community. The main subject and respondent were determined as follows:

1. Customary leaders.
2. Village Governance.
3. Community leaders.
4. Industry Owners
5. Forest encroachers

Issues posed to each subject or key respondent in each set may be the same issue, since the answers obtained will be the control for answers that come from other categories of individuals. Thus the principle of data triangulation will be fulfilled. In order to get a balanced answer, and can compare answers according to the principle of triangulation

IV. DISCUSSION

History of the Tribe Akit

Tribe Akit or Akik, is a social group that has long occupied the coastal areas of Riau and Riau Islands. Called Tribe Akit because this community mostly live on the raft houses, then with the raft they move and somewhere to another place, on the beach, sea and river mouth. The Akit tribe is known for its traditional weapons of poisoned arrows and blowing chopsticks. The main livelihood of the Tribe Akit is to catch fish, collect forest products, to bless animals and gather sago.

According to Ardi (2013) estimated in the 17th century AD, when Sultan Siak Sri Indrapura enthroned sekelompok tribe who bermukim along the Mandau River pleaded to the sultan to be given permission as well as found a place to move to a new territory and still entered the territory of the sultan, They along the Mandau River is disturbed by wild animals and there is news of the entry of the Netherlands into the territory of the kingdom of Siak. Their request was permitted by the sultan and they faced Megat Alang Dilaut as the ruler of the sea domiciled in Bukil Bata. Megat Alang Dilaut Pointing Bengkalis Island as a new residence for the people of Akit, because the land on this island is not so fertile and there is fear they will be attacked by the Dutch, once they put the reasons to Megat Alang Dilaut then they are given the opportunity to see an island in the North of Bengkalis Island is Rupert Island, Arriving at Rupert Island they encounter a strait that is Morong Strait that splits Rupert Island into two parts. In the Strait of Morong this group met with Datuk Rempang. Based on the folklore Datuk Rempang is a magic person so easily knowing the purpose of the arrival of this entourage to Rupert island, to settle on Rupert Island Datuk Rempang make an agreement whose contents that Datuk Rempang can submit the Island if the group can replace with (1) a piece of rice eye , (2) a piece of tampin sago, (3) dying kerojor eyes (one species of marine animals).

After all the requirements are accepted by Datuk Rempang then he is advised, if you really want to live in this region then: (1) do not be two hearts, (2) if you have trouble burning white incense and call him his name, then he will help the difficulties encountered (3) the entourage will be escorted by Datuk Rempang guard, the East is escorted by Datuk Bintang Beheleh, West Datuk Kebeneh, North (upstream) Datuk Sakti and the South (kuala) by Panglima Galang. (4) This island called Pulau Bertukah. (5) The island should not be sold or pawned and (6) After settling to inform the Sultan.

Furthermore, by using three canoe depart three groups to Siak, when they arrived in Siak they run on every house Akit tribe until now has been widely used.

Utilization of Mangrove Forest Berancah

Mangrove forests are tropical natural resources that have multiple benefits as well as major effects, especially on economic and ecological aspects. The magnitude of the role of mangrove forests can be known from the many types of animals both living in the waters, on land or in the canopy of mangrove trees and humans who still depend on mangrove forests. Akit Tribe Society is one of the original tribe who live in Berancah village from generation to generation make mangrove forest as the main source of livelihood for the society. Almost every family from the Akit Tribe is a mangrove seeker or a worker in Panglong Charcoal. The existence of this economic motivation is the basic foundation of Akit Tribe society in utilizing mangrove wood. This is in accordance with the statement of Mr. Jang (Former Chairman of RT) and Pak Alan (Community Leaders Akit) who argue that:

"The main objective of Akit Tribe community in exploiting mangrove is solely to meet the daily economic needs".

Most of the mangrove wood that is used for the production of wood charcoal is Rhizophoraceae type such as *Rhizophora apiculata*, *Rhizophora mucronata*, and *Bruguiera gymnorhiza* with diameter size 4-15 cm and average length of 2.5 meter. While the size of mangrove wood used is saplings and trees. However, according to Indrayani (2002), the utilization of mangrove wood on Bengkalis Island is more seedlings with stem diameter ≤ 5 cm and seed size (sapling) with stem diameter > 5 -12 cm. Miswadi (2012) added that the utilization of mangrove wood in Liung River is taken from seedling size category ≤ 4 cm to tree (mature) > 4 cm. This shows that the utilization of mangrove wood does not depend on size alone but rather on price.

According to Susilo (2007) states that the life of a community that is ekat and directly related to the mangrove ecosystem, encourage people to use it as the fulfillment of needs in his life. In fact it can not be separated between mangrove wood used by the community as raw material of charcoal and charcoal fuel production because the collection process takes place at

the same place and is calculated at the same price in panglong charcoal.

Picture 3 : Charcoal "Panglong"



Indigenous Peoples' Behavior (Akit tribe) in Utilization of Mangrove Forest.

Communities that inhabit coastal areas, especially those related to mangrove forests have traditionally carried out various practices of exploiting mangrove forests as an economic source. Communities often develop specific means and management facilities for these resources, and often have real power over larger biological resources and government (Macne in Haikal, 2008). As well as the community of Akit Tribe who have long occupied the watershed in Berancah Village. According to community figures Akit Pak Alan Tribe said that:

"The Akit people began to recognize the charcoal kitchen in Berancah Village around the 1960s with the small scale, but over time and the increasing demand for charcoal, in the early 1980s a large charcoal business was established, with its workers being Akit Tribe people".

But this did not last long, so the Akit Tribe people who had previously been dependent on this charcoal kitchen profession, felt lost their livelihood. To avoid this, the community of Akit tribe makes panglong charcoal itself with a small scale in every home, with the aim that family economic life is still running. Based on

that experience they can make a better charcoal so it has a selling and consumptive value.

Economically, the Tribe Akit people use the mangrove forest as a source of livelihood in fulfilling their life needs. Majority of Akit tribes in Berancah Village work as mangrove seekers, panglong workers and panglong charcoal owners. This shows the dependence of the people of Akit Tribe on mangrove forests is still quite large, although most people pay less attention to the aspects of sustainability so that the damage of mangrove forest is quite severe.

Mangrove forest is an inseparable part and daily life of the people of Akit Tribe. Through the availability of mangrove forest resources, the community of Akit Tribe can do the things that are very important in fulfilling their life needs such as mangrove mancari for the raw material of making charcoal, berbura, gathering and catching fish (lauk) in the river flow in the mangrove forest. Forest resources provide renewable employment opportunities, provided they are utilized to the extent of subsistence needs and provide a natural recovery time or assisted in recovery made by the Akit Tribe community. Based on the social and cultural community, the existence of mangrove forest and panglong arang become a social culture for generations

There is a system of division of labor that has been arranged for generations from the family of charcoal stove owners who have died. The present owner of the charcoal furnace still adheres to the old belief that workers selected to work on charcoal furnaces should be experts in their respective fields. Based on interviews that have been done with informants it is known that each worker can only do one job only. That is, workers should not perform two or three types of work on charcoal stoves. From the research that has been done, it is known there are four types of division of labor in the stove charcoal Village Berancah, namely as follows:

1. Seawater mover
2. Burning mangrove wood
3. Disassemble the charcoal from the furnace
4. Load the charcoal into the space provided

The four types of employment above may not be undertaken in a double manner by the worker. Workers are only allowed to do one field only. This is done by the owner so that the work done by the workers is clean and tidy. In addition, in charcoal panglong work system does not have the agreement in job security between the

owner and the worker. The pure worker works. If something happens or work accidents to charcoal workers panglong charcoal stove owners have no responsibility for accidents that occur.

From the research conducted it is known that there are three kinds of socio-economic relationships formed in the working system of panglong charcoal in Berancah Village, which is as follows: Mutual help.

In all walks of life help is a very classic activity. Please help has existed since ancient times. In the panglong charcoal system there is a social connection to help the typical. Typical here because the owner does not want to increase the amount of wages given to the charcoal stove owner. But if in the form of necessities of life such as urgent necessity then the owner of panglong charcoal will help with pleasure. That's why charcoal stove workers do not want a lot of demands on the wages given the owner because it has been much assisted in the necessities of life.

Bargaining System

The bargaining system in question is a form of cooperation based on the same purpose. Between the owners and charcoal workers there is an inevitable bargaining process in determining the wage set and the wages to be received. In this bargain the workers are not much benefited. Workers often ask for a slight increase in wages but still get no response from the owner of the charcoal stove.

The existence of Collective Ties in Social Relations

The collective relationship in question is that workers are bound by emotional similarity among workers. Then the owner of the panglong has a trust originating from the ancestors that the division of labor on charcoal panglong is better done by the tribe akit. Panglong Charcoal owners believe that the tribe is the best worker in processing mangrove plants. The result of the work of the famous tribe rapid and clean. Also they focus on work and do not demand a lot of results from their work.

V. CONCLUSSION

Based on the research results can be concluded:

1. In general, Akit community behavior is still obedient to the hereditary social culture in the utilization of mangrove forests. The existence of Akit tribe along

the river in Berancah village gives a considerable impact in the utilization of mangrove forest area. Proven by the existence of Panglong Charcoal as well as the dependence of the Akit Tribe on the Forest

2. Based on the economic aspect of society Akit Tribe utilizes the basic material of making of charcoal which is processed in panglong charcoal and then marketed. Panglong charcoal is a medium of socialization among them.

The existence of Akit community along Berancah village provides great benefits in the sustainability of mangrove forest ecosystem, therefore it is necessary to do the following:

1. Partnership is needed in building Akit Tribe community related to the utilization of mangrove forest in Berancah village
2. Government policy is needed in the utilization of community-based mangrove forest resources, especially the Akit tribe.
3. The need for community commitment Akit Tribe to maintain forest sustainability for the abrasion level in the village Berancah decline.

REFERENCES

- [1] Ardi, H.R. 2013 Profile Suku Akit Di Teluk Setimbul Kecamatan Meral Kabupaten Karimun Kepulauan Riau. [Http:// repository. unri.ac.id/xmlui/bitstream/handle/ jurnal.pdf](http://repository.unri.ac.id/xmlui/bitstream/handle/jurnal.pdf)
- [2] Fukuyama, Francis ; 1995 : Trust : The Social Virtues and The Creation of Prosperity. London : Hamis and Hamilton
- [3] Fukuyama, Francis. 1999. Social Capital and Civil Society. Institute of PublicPolicy. George Mason University.
- [4] Haikal, 2008. Pengelolaan Ekosistem Mangrove di Kecamatan Nipah Panjang Kabupaten Tanjung Jabung Jawa Timur. Tesis. Sekolah Pasca Sarjana Institut Pertanian Bogor. Bogor.
- [5] Indriyani, E. 2012. Pendekatan ekonomi-Ekologi dalam pengelolaan Hutan Mangrove di Pulau Bengkalis Kabupaten Bengkalis Provinsi Riau.
- [6] Lawang, Robert. 2013. Social Capital : sebuah pengantar sosiolingustik. UI Press. Jakarta
- [7] Michael Woolcock, Social Scientist, Development and Research, Social Capital Participant in the Seminar held by the performance and Innovation Unit on the 26 th March 2002
- [8] Putnam, Robert“Tuning In, Tuning Out : The Strange Disappearance of Social Capital in America”. Political Studies Vol. 4 No. 28.
- [9] _____, 1993, The Prosperous Community-Social Capital and Public Life, American Prospect.
- [10] _____, 2000. Bowling Alone: The Collapse and Revival of American Community. Simon and Schuster. New York

The Effectiveness English Camp (A Model in Learning English as the Second Language)

Muhammad Aswad

English Education Department, Faculty of Social and Political Science
West Sulawesi University

Address: Jl. Prof. Dr. H. Baharuddin Lopa, SH., Majene Regency,
West Sulawesi, Indonesia

E-mail: aswad@unsulbar.ac.id

ABSTRACT

Language teachers are often encouraged to use creative teaching in the classroom and out door. The creative teaching and learning here is using the best method, media, technique, and learning style based the pupils are needed. Creative learning can be held in outdoor and indoor and learning style can be said as good, it is English camp. English camp is presented as socially and psychologically beneficial to learners, helping to relax them, to create a comfortable classroom atmosphere, to create bonds classmates, to raise student interest, and simply to make learning more enjoyable. Using English camp in learning English as the second language is effective way to improve the students' interest and ability because English camp is able to create the learning becomes more varied and more vivid, feels the strain when learning can be reduced, creating communication that familiar, stretch the nervous strained into relax, and creating the attractiveness of learning. The purpose of the study is to find out the students' interest and ability in English. The method used in this research was quasi-experimental design, it is assigned two groups namely experimental and control group. To collect the data, the researcher used three instruments, they are interview, participant observation, and discourse analysis of the audiotaped and videotaped interaction. The result show that there is differences interest and ability before and after leaning English through English camp. Thus, it is recommended for all English teachers to improve students' interest and English ability as the second language.

Keywords: English camp, L2 learners' interest and achievement, language classroom.

I. INTRODUCTION

Language teacher are often encouraged to use contextual teaching learning (CTL) in the classroom. CTL is presented as socially and psychologically beneficial to learners, helping to relax them, to create a comfortable classroom atmosphere, to create a comfortable classroom atmosphere, to create bonds among classmates, to raise student interest, and simply to make learning more enjoyable and it is English camp activities. It is a well known fact to the best way to learn a foreign language in a country where that language is spoken, and also the students are able to pick up foreign language a lot faster than adults.

English camp one of the activity in learning English as second language, where in the camp you will spend some of your time in English classess with other students from around the world, and the rest of your time joining in with exciting activities and excursions. Based on the English summer camp in the UK (Twin Summer Camp) you will study for 15

hours per week with professional teachers, who know how to make sure that you enjoy learning. Based on the assesment of your English level, age, and first language, you will be placed into a class that is suited to you and that has a well-balanced nationality mix (so you will have to speak English with any friends you make).

There are two causes of this problem. The first, unlimited examples, therefore the teacher needs to give many examples. The second, the students are bored or uninterested with the teaching method applied by the teacher. Therefore, the teacher need effective strategy or technique to overcome it.

Considering of the advantages of English camp above, the research conducted the study on English camp in English teaching and learning process to improve the students' English ability of Universitas Sulawesi Barat (UNSULBAR).

A. The Positive Effect of English Camp

The positive effects on language proficiency and motivation may spring from a synergistic interaction

of three elements in English camp: (a) the camp context; (b) the interactive nature of the teaching and learning activities; and (c) the opportunity to use spoken English for authentic purposes. By its very nature, a camp setting is removed from the everyday experiences of students and teachers alike. Language camps, where two cultures meet in a novel setting to focus on spoken English, provide students with rich and authentic language experiences. At the camp described in this study, the teaching and learning experiences were characterized by engagement and interaction. Since students and teachers were housed at the same hotel, shared meals, and were involved in various activities and teaching and learning experiences from early in the morning to late in the evening, opportunity to practice spoken English was maximized. Perhaps even more importantly, the camp provides a unique opportunity for participants to use English for authentic purposes. One of the primary manifestations of authentic use of language at this camp was in the building of relationships. Participants revealed that relationships were developed and strengthened on multiple levels: student-to-student, teacher-to-teacher, and teacher-to-student. The authentic use of language happened rather naturally as a by-product of the sustained interaction that took place at the camp. Interestingly, while the teachers at this camp were not trained in CLT, the type of authentic language interaction that is the core of CLT occurred [4].

This study is uniquely different from other research on immersion programs, but it clearly demonstrates a significant improvement in students' learning. The camp leaders are immersed within a foreign culture. At the same time, the Thai college students are immersed within an English-speaking environment while still in their indigenous culture. It is an immersion program within an immersion program. The English Camp Language Immersion Program needs to be replicated and investigated more fully so that students in various countries can reap the important benefits inherent in its structure. It is a concept that warrants further implementation and investigation [3].

B. The Benefit of Studying Abroad at English Camp

Studying abroad at a camp is a truly enriching, fun and enjoyable experience and is a holiday that everyone should have the chance to go on at some point during their childhood though it might seem like a big, scary step to send your child away to a foreign country for the summer holidays, there are so

many benefits of studying in English camp. If you've been to camp, you're not surprised to hear about the benefits of summer camp. Experiencing life at camp yourself as a child, you know the profound positive effects that still matter to you as an adult, and you also know that you want the same thing for your own kids. But if you didn't go to camp as a child, you may not realize just how good the experience is for children. You may not know why so many parents are committed to sending their kids to camp. So while we have talked about most of these before, here is a list of the most important reasons to send your kids to camp.

1. *Spend their day being physically active* – As children spend so much time these days inside and mostly sitting down, camp provides a wonderful opportunity to move. Running, swimming, jumping, hiking, climbing! [Camp is action!](#)
2. *Experience success and become more confident* – Camp helps children build self-confidence and self-esteem by removing the kind of academic, athletic and social competition that shapes their lives at school. With its non-competitive activities and diverse opportunities to succeed, camp life is a real boost for young people. There's accomplishment every day. [Camp teaches kids that they can.](#)
3. *Gain resiliency* – The kind of encouragement and nurture kids receive at camp makes it a great environment to endure setbacks, try new (and thereby maybe a little frightening) things, and see that improvement comes when you give something another try. [Camp helps conquer fears.](#)
4. *Unplug from technology* – When kids take a break from TV, cell phones, and the Internet, they rediscover their creative powers and engage the real world— real people, real activities, and real emotions. They realize, there's always plenty to do. [Camp is real!](#)
5. *Develop life-long skills* – Camps provide the right instruction, equipment and facilities for kids to enhance their sports abilities, their artistic talents, and their adventure skills. The sheer variety of activities offered at camp makes it easy for kids to discover and develop what they like to do. [Camp expands every child's abilities.](#)
6. *Grow more independent* – Camp is the perfect place for kids to practice making decisions for themselves without parents and teachers guiding every move. Managing their daily choices in the

safe, caring environment of camp, children welcome this as a freedom to blossom in new directions. [Camp helps kids develop who they are](#).

7. *Have free time for unstructured play* – Free from the overly-structured, overly-scheduled routines of home and school, life at camp gives children much needed free time to just play. Camp is a slice of carefree living where kids can relax, laugh, and be silly all day long. [At camp we play!](#)
8. *Learn social skills* – Coming to camp means joining a close-knit community where everyone must agree to cooperate and respect each other. When they live in a cabin with others, kids share chores, resolve disagreements, and see firsthand the importance of sincere communication. [Camp builds teamwork](#).
9. *Reconnect with nature* – Camp is a wonderful antidote to “nature deficit disorder,” to the narrow experience of modern indoor life. Outdoor experience enriches kid’s perception of the world and supports healthy child development. [Camp gets kids back outside](#).
10. *Make true friends* – Camp is the place where kids make their very best friends. Free from the social expectations pressuring them at school, camp encourages kids to relax and make friends easily. All the fun at camp draws everyone together—singing, laughing, talking, playing, doing almost everything together. Everyday, [camp creates friendships](#).

C. How to Put on Successful English Camp

Based on the English by Kanuengnut, nowadays English teaching techniques in classroom are developed continuously, but they may not enough for the students. Because of English learning which cannot support students to learn well is not a good way. The effective learning is to developed students’ skill such as listening, speaking, reading, and writing. Furthermore, it has to be fun and exciting for stimulates students’ learning. English camp is a good activity which can effectively developed students’ language learning. It provides a good opportunity for students to use English in several situations. English is taught through various activities, games, sings, ect. Students can gain both new knowledge and experiences. As we can see that English camp as effective method to teach English well. So, teachers who create and English camp have to realize how to put on successful English camp. There are many parts

such as ice breaker (it is the first station where all students must be there together), game (crossword, bingo, hangman, scramble, and so on), song activity and time which have to create for students.

II. METHODS

In this research, the researcher applied quasi experimental design. The purpose of the research is to find out the students’ English achievement through English camp. Both groups were given pre-test and post-test in which the pre-test was administered to measure prior competence of English while the post-test was administered to measure the effect of the treatment.

Sample In this research, the researcher applied purposive sampling technique. The sample of the reasearch was taken two classes as the sample which representate the experimental or English camp (L1) was 29 students and control group (L2) was 28 students. The number of total sample was 57 students

The instrument of the research, the researcher used one kind of test, it is English test to conduct of the research. The instrument used in this research was speaking performance test by using demonstrate how to make or operate something which was distributed to the students that contain instructions and questions to lead them focus on the activity they should do and the discourses they had to produce. The test consists of pre-test and post-test. For experimental group, the researcher shows 1) students’ attitudes towards humor in ESL classrooms such as: humor helps in learning difficult ESL, humor increase attention, humor increase concentration level, and use humor in English learning for time to time ot all time, 2) The effect of humor on class management and the ESL learning setting such as using humor helps shy students to participate with the group, humor gives students confidence in expressing personal opinions in English, it can create enjoyment in the English learning situation.

III. RESULT AND DISCUSSION

A. English Classification

As explained previously that the way to collect the data was by administrating English test. The test was three times, pre-test was given before the treatment, and several days after the treatment was given post-test for taking final data. The findings that the researcher reports in this chapter based on the data collection. The students from L.1 (experimental group) and L.2 (control group) were given pretest to determine their prior knowledge in English.

Table 1 The Classification of Pre-test for English camp and Control Groups

| No. | Classification | Score | Experimental Group | | Control Group | |
|-----|----------------|--------|--------------------|-------|---------------|-------|
| | | | F | (%) | F | (%) |
| 1 | Very Good | 90-100 | 3 | 10 | 2 | 7.14 |
| 2 | Good | 75-89 | 3 | 10 | 3 | 10.71 |
| 3 | Fair | 60-74 | 16 | 53.33 | 9 | 32.15 |
| 4 | Poor | <59 | 8 | 26.67 | 14 | 50 |
| | | | 30 | 100 | 28 | 100 |

Chart 1 Classification in pre-test of experimental and control groups

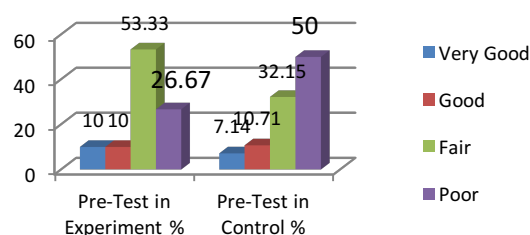


Table and chart 1 above shows that the student's score in pre-test from humor group, the researcher found that there were 3 (10) % student got very good and good classification, there were 16 (53.33)% students classified into satisfactory classification and 11 (45.8%) students were classified into fair classification, there were 8 (26.67%) students classified into poor classification. While the control group, almost same the humor group, the researcher found that there were 2 (7.14) % students got very good, there were 3 (10.71) % students into good classification, there were 9 (32.15) % students into fair classification and 14 students got poor classification.

Table 2 The Classification of Post-test for English camp and Control Groups

| No | Classification | Score | Humor Group | | Control Group | |
|----|----------------|--------|-------------|-------|---------------|-------|
| | | | F | (%) | F | (%) |
| 1 | Very Good | 90-100 | 14 | 46.67 | 3 | 10.71 |
| 2 | Good | 75-89 | 13 | 43.33 | 7 | 25 |
| 3 | Fair | 60-74 | 3 | 10 | 8 | 28.57 |
| 4 | Poor | <59 | - | 0 | 10 | 35.72 |
| | | | 30 | 100 | 28 | 100 |

Chart 2 Score classification in post-test of English camp and control groups

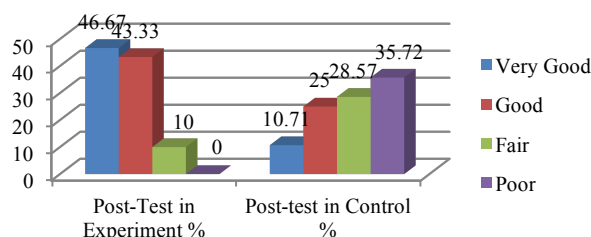


Table and chart 2 above shows that the student's score in post-test from humor group, the researcher found that there were 14 (46.67) % got very good classification, there were 13 (43.33) % students got good classification, there were 16 (53.33)% students classified into satisfactory classification and 3 (10%) students were classified into fair classification, and none student got poor classification. While the control group, almost same the English camp group, the researcher found that there were 2 (7.14) % students got very good, there were 3 (10.71) % students into very good classification, there were 7 (25) % students into good classification and 8 (28.57) % students got fair classification and there were 10 (35.72) % students got poor classification.

The following table above shows the specific result of the students' pretest in humor and control group. The data were and tabulated by using inferential analysis. The researcher used SPSS Version 21 to find the test of significance which usually called for the independence sample. The level of significance is 0.05. The hypothesis was tested by using inferential analysis. In this case, the researcher used t-test (testing of significance) for independent sample test, which is a test to know the significance different between the result of student's mean score in pre-test and post-test in experimental and control group.

Table 3 The t-test value of the student's Pre-test and Post-test

| Variable | Probability Value | α |
|-----------|-------------------|----------|
| Pre-test | 0.514 | 0.05 |
| Post-test | 0.02 | |

The table above shows that P-value (0.01) was lower than $\alpha = 0.05$ ($0.02 < 0.05$). it means that the difference of students' knowledge statistically was significance H1 was acceptable and the statistical hypothesis of Ho was rejected. There was significance different between the post-test of the

students of both groups after treatment by using English camp.

The following table shows about the students' attitudes towards English camp. In this research, the researcher used three point questions for English camp group they are 1) English camp and learning (humor helps in learning difficult ESL material, English camp helps in learning general ESL material, and English camp doesn't help in learning English) 2) English camp and concentration (English camp increase attention, English camp increase concentration level, English camp doesn't increase attention), 3) how much more (use English camp in ESL learning from time to time, use English camp in ESL learning all the time, don't use English camp).

The results of this research shows that English camp can be beneficial in the second language classroom. English camp promotes the feeling of understanding and helps to hold the attention of and concentration of students, regardless of the cultural learning situation.

IV. DISCUSSION AND CONCLUSION

The discussion deals with argument based on the finding from descriptive statistics and inferential statistics of the data, and some theories and interpretation of the pretest result compared with posttest both groups, control group and specially humor group as the process of implementing the English camp in teaching and learning English. This section presents the students' English achievement of the first semester students of Universitas Sulawesi Barat in academic 2016/2017. Based on the data illustrated from the findings. Before giving the treatment, the result of pretest of experimental and control group were almost statistically the same and classified as fair in English.

Both of the groups were taught by different treatment. The English camp group was taught by implementing or using English camp while the control group was taught by formal communication. The core of the teaching and learning is the task and the students' English. Starting with the mean score in pretest of both groups, experimental and control group showed that there was no significant different, by using independent sample t-test, the mean scores were not significantly different. It was proved by the statistical data analysis that the probability value or Sig. (2-tailed) was lower than α .

Comparing with the students' English in posttest of the control group which the classification was not improved; students' English of English camp

group was significantly improved. The mean score in posttest of both group also improved but both groups were significantly different. For instance, the English camp group pretest and control group pretest were not really different.

In the t-test statistical analysis, the result of the probability value (0.02) was lower than probability test or α (0.05). This means that H1 was accepted and H0 was rejected. It supported that there was a significant difference between the students who were taught by English camp in learning English as the second language. Using humorous communication in the classroom make students enjoyable to the process and after teaching it, there are many students are not shy to speak, ask to the lecture in their friends, and giving opinion front of the class.

The use of English camp in learning English was effective to improve of the first semester students of Universitas Sulawesi Barat after being given treatment. The mean score of experimental group in post-test and control group were significantly different. The mean score of post-test in experimental group is higher than the control group (80.66 > 66.14). so it is concluded that the use of English camp in learning English was effective to improve the students' English achievement of the first semester students of Universitas Sulawesi Barat. It's supported by Kanuengnut, nowadays English teaching techniques in classroom are developed continuously, but they may not enough for the students. Because of English learning which cannot support students to learn well is not a good way. The effective learning is to developed students' skill such as listening, speaking, reading, and writing. Furthermore, it has to be fun and exciting for stimulates students' learning. English camp is a good activity which can effectively developed students' language learning. It provides a good opportunity for students to use English in several situations. English is taught through various activities, games, sings, ect. It supported by Ahmed and Ziyad [1] in their research It does not matter indoor or outdoor; we cannot deny the importance of games. If students learn with games, have fun, feel happy and free, it means that you have reached your goals. Games strengthen language skills, besides; learners develop social skills and good relationships while they interact with each other. Students can gain both new knowledge and experiences. As we can see that English camp as effective method to teach English well. So, teachers who create and English camp have to realize how to put on successful English camp. There are many parts such as ice breaker (it is

the first station where all students must be there together), game (crossword, bingo, hangman, scramble, and so on), song activity and time which have to create for students. But in organizing an English camp one important factor has been observed in the planning process-station teacher are asked to design fun activities. This can lead to unwanted results because teachers focus upon activities that are fun the expense of good English practice which is appropriate for the level of [5].

REFERENCES

- [1] Ahmed Awad Amin Mahmoud Ziyad Ahmed Tanni. Using Games to Promote Students' Motivation towards Learning English. Al-Quds Open University Journal for Educational & Psychological Research & Studies - Vol. 2 - No. 5 - April 2014
- [2] Arining Wibowo. Kampung Inggris di Lingkup Sekolah Sebagai Prasarana Alternatif Pembelajaran Bahasa Inggris Intensif. Jurnal Ilmiah Bahasa dan Sastra: ISSN 23557083 Vol. 3 Nomor 1 Juni 2015.
- [3] Kris Rugasken and Jacqueline A. Harris. English Camp: A Language Immersion Program in Thailand. | Ball State University | Teachers College #915 |Muncie, IN 47306 krugsake@bsu.edu. TLAR, Volume 14, Number 2
- [4] Mervyn J. Wighting, Deanna L. Nisbet, Evie R. Tindal. 2006. Exploring a Summer English Language Camp Experience in China: A Descriptive Case Study. Asian EFL Journal.
- [5] Sangvatanchai, Woralap. Respons-stimulating English Camp Activities. Khon Kaen University. Thailand.
- [6] Sites.google.com. Acessed on June 8 2017.
- [7] Twin Summer Centers. www.twinsummercentres.com. Acessed on June 8 2017.
- [8] Top 10 Reasons Why Summer Camp is Great for Children _ Rockbrook Camp.htm

Students' Perceptions on the Use of English Vlog (Video Blog) to Enhance Speaking Skill

¹Nailis Sa'adah Safitri, ²Ianatul Khoiriyah

English Education Department, Universitas Islam Indonesia, Yogyakarta, Indonesia

E-mail: nailis927@gmail.com

ABSTRACT

Nowadays, English proficiency is needed for all people including students. They are required to master all skills in English language including speaking skill. There have been many strategies of students to learn speaking both in and outside the classroom. But generally, those strategies are still difficult to be applied due to several aspects. The development of technology leads students to have many resources to learn English in order to offset in English class or even in daily communication. Therefore, the technology may help students to enhance their speaking skill through E-Learning media. In this paper, the authors tried to reveal students' strategy to enhance their speaking skills through the use of English Vlog. The purposes of this research were: 1) to know how students' perception on the use of English Vlog to enhance speaking skill, and 2) to study about what student's strategy in using English Vlog to enhance speaking skill. The samples were 5 students of English Education Department of Universitas Islam Indonesia who learnt Listening and speaking subject. The authors applied a purposeful sampling technique to get samples. The type of research was qualitative research. The method of the research concerned to the students' perception in the use of English Vlog and students' strategy to use it while the data came from the students' interview, observation, and document. The result shows that students' perceptions on the use of English Vlog to enhance speaking skill are good through various strategies. Furthermore, students have good English skills by using English Vlog as the media to learn English.

Key words: *English Vlog, Speaking skill, Student's perception, Student's strategy*

I. INTRODUCTION

Improving speaking skill will help people to easily communicate with each other without misunderstanding and misapprehension. The data from the TOEFL iBT Test in 2015 shows the Percentile Ranks for TOEFL iBT Scores for Undergraduate Level Students: *S.D. for reading skill is 6,9 listening skill 7 speaking skill 4,6 while writing skill is 5* [1]. The data shows from the four skills, speaking skill is occupied the lowest rank which means this major skill need to be improved. Indonesia as the Expanding Circle Country where the people learn English as their foreign language (EFL), have several problems related to speaking. Although English has been taught for about many years in previous schools, university students still have difficulties in mastering speaking skill. In fact, through speaking students may easy to learn other skills such as reading and writing. Reference [2] stated that there are many language teachers argued in order to be fluent in reading and writing the most important skill to consider is by an effective speaking. Furthermore, students are not only limited to what they received from the class, they need input from several aspects that can help them in enhancing speaking skills outside the classroom wall. This incentive aspect is personalized according to the hobbies and interests of each student.

Nowadays, by increasing technology students have many resources to enhance their speaking skill as

technology provides eases to academic and education sides. Therefore, students may obtain knowledge from anywhere and everywhere. Learner may be more active in his or her learning by technology and technology has potential to change from passive to active learner [3]. A professor at the Massachusetts Institute of Technology, Seymour Papert said that the learning has changed by the potential of technology features. Thus, through technology students have high motivation to learn such as it provides active engagement, collaborative teamwork, and it helps students with wider sources (2000 report by a team from SRI International) [4].

In order to have specific way in enhancing speaking skill, students significantly have strategies towards it. One strategy that may discuss in this study is the use of English Video Blog or known as Vlog through YouTube as a video sharing website by watching it. How E-Vlog affects students' comprehension in English especially to enhance speaking skill will be discussed further in this paper. Video blogging offers a richer experience than the sites with blogging in the form of text, because it combines video, sound, pictures, and text, increase the information content, and emotions which are shared with other internet users. Therefore, through this research the authors will study and evaluate how students' perceptions on the use of English Vlog or E-Vlog and their strategies to use it because this research was done to answer the following research questions: 1) How is

student's perception on the use (watch) of E-Vlog to enhance speaking skill? and 2) What is student's strategy in using (watching) E-Vlog to enhance speaking skill?

This study might provide several advantages for stakeholders including researcher, lecturer, and department. First, as for researcher this study is expected to help all sides in the field of teaching and learning English. Second, this study is expected to give lecturer one sight that students have different media to support them in learning English especially for speaking skill. Thus, lecturer will have consideration in providing varied activities or materials for students. Third, for the department, this study will give a representation that nowadays students' resources for learning always increase due the development of technology. Therefore, the department can support students with the better ICT base learning tools. In addition, the study might increase other research which already done by many researchers. The present study can give good resource in the field of teaching and learning English for EFL in Indonesia.

II. LITERATURE REVIEW

In this chapter the author provides the related literature about the research.

1. Literature Review

A. Definition of Perception

Perception plays an important role in learning process. According to the definition of [5] perception is the process of how people experienced on what they viewed through sensory receptors. The definition was supported by [6] as he defined perception as process of thinking or feeling something. In addition, Sankhya's theory relates with personal knowledge where perception indicated the ego in one unit [7]. The information that have processed by people may be eliminated or accepted by sensory receptors. Perception related to experience on how people do activities or to certain objects around. Thus, the object considered by senses or body into some reflections. Based on the above theory it can be summarized that perception is the process where people interpreted something based on their own experience as the result of stimuli in producing information.

Reference [8] defined the perception can be affected by two factors which included internal and external factors. The internal factor involves belief, experience, self acceptance, background, personality, and attitudes, while external factors involves repetition, measurement, movement, familiarity, and something new. Both internal and external factors can affect how people express their thoughts.

In this study, perception relates to students' experiences on watching E-Vlog as strategy to enhance speaking skill.

B. Speaking

The notion of communication competence in English language has become the focus competency as it became an international language in the world [9]. Thus, speaking skill played as an essential skill to be learnt because it relates with the communication competency.

a. Speaking skill

One major skill in English that needs to be mastered is speaking skill. Speaking itself is the process of delivering message or speech to others in order to give information. Speaking is the process to construct meaning that includes producing, processing and receiving information [10]. It becomes a productive skill as well as a complicated skill to be learnt which involves many aspects including pronunciation [11]. Speaking skill also acts as the core of second language learning that differs from the other three skills such as listening, reading and writing because it involves the process of constructing meaning in order to receive an information [12]. In addition, [13] defined that the focus in speaking was on motor perceptive skills. Thus, speaking is the production of signals to show verbal response to listener. In delivering information, speakers tend to use their abilities in order to provide clear information for listener. Therefore, its function is to help students to make a good interaction in exchanging information through speaking skill.

In order to make successful in enhancing students' speaking skill, students need supports from the curriculum in their school or university, as it becomes an important skill which includes in the curriculum of language teaching [14]. This skill may affect students' achievements through their assessments. According to [15] the curriculum should encompass learners' involvements in the lesson and practical setting to the authentic situation whereas the international and local cultures involves in it. Besides, other experts argued that curriculum must be suitable to the classroom activities in order to enhance speaking outcomes.

b. Speaking ability

Speaking becomes a crucial matter in language learning. Speaking ability includes students' competency in speaking skills itself. In speaking process there are many elements that need to be understood such as vocabulary, grammar, pronunciation, and intonation.

Each element has connection one and others. Vocabulary is the important matter in speaking because by vocabularies, speaker can express their idea and deliver information without any problems. Grammar becomes the structure of how speaker can deliver the message because through the good structure of language, the listener may understand the information well. Another element is pronunciation where English sound and voice produced. If any mistaken happen in pronouncing English word, misunderstanding will happen to listener. Then, the communication will not occur. The last element is intonation. Through this element, speaker may successfully deliver the message to others. In addition, all of those elements support students to master English skill especially in speaking. By knowing grammatical and semantic rules are not enough, students also need to understand the use of English language that suit with language context as native speaker used. There are two matters that involves in speaking ability. Those are as follow: accuracy and fluency. Speaking accuracy deals with the language norms, while speaking fluency deals with the production of spoken language [16]. The accuracy and fluency may be not easy. It requires good understanding before using it in speaking well. Therefore, in order to master oral fluency in English, students need a lot of practices.

C. E-Vlog

English were taught as the foreign language in Indonesia, but this language became an international language in the world. According to that fact, English must be mastered by people including students. In order to enhance students' skill in English especially in speaking as the most crucial skill to be learnt, as the millineal students, they tend to use technology to support their learning in English. Reference [17] stated that technology gives easiest way for many people. In the other words, *"The technology offers access, authenticity, and insights"*. One side who feel its eases are students. Moreover, technology brings students to engage more in their safe environment [18].

Technology provides students with many media to learn English especially for enhancing speaking skill. One media that used by students is E-Vlog. As stated by [19] *"Vlog is a form of blogging which the main medium is video, short for video blogging"*. Nowadays Vlog becomes popular to reach the masses. People are familiar with Vlog because it is easy to assess through Smartphone, iPad or tablet [20].

In learning process, some students seem to choose E-Vlog as their alternative to support their learning English. This is because through E-Vlog students

consider the expression and the content of the video in Vlog are more natural and interesting than any written blog, while in relation with speaking skill, E-Vlog is play as supporting media and model for students to learn speaking independently. E-Vlog provides information directly from native speakers because it is in form of video which is helpful. In addition, students can enjoy their learning through E-Vlog because it is more interactive, descriptive, and more visual. Therefore, E-Vlog has many advantages to support students to enhance their speaking skill.

Furthermore, there are several types of Vlog such as video of personal life, news, entertainment and magazines. The examples of famous English vloggers are Graham Walker, Steve Garfield, Josh Wolf, and Raymond Kristiansen [21]. While the Vlog is commonly used by an artist, news reporter or journalist, and technology geeks [22]. In this study the authors focused on how students maximize E-Vlog by watching it outside the class through YouTube media in order to support their English subject especially for speaking. Students use the general type of E-Vlog where native speakers talk about their daily life. As in this study the authors analyze students' perceptions and their strategies to enhance speaking skill through the use of E-Vlog.

III. METHODOLOGY

A. Scope of the Study

1. Participants

The participants of this research were 5 students (two males and three females) of English Education Department, Faculty of Psychology and Socio-cultural Science, Universitas Islam Indonesia who learnt Listening and speaking subject by using purposeful sampling. The participants were chosen because of several reasons. First, those students watch E-Vlog to enhance Speaking skill. Then, the 5 participants were categorized based on their length of watching E-Vlog to enhance speaking skill. Table 1 shows the categorization of participants. Second, the participants got a good mark on Listening and speaking subject. Third, the participants are accessible, because all are students of PBI UII. Fourth, PBI UII is an institution which already applied ICT based in the process of teaching and learning in the classroom. Therefore students may have opportunity to use any media of technology in learning such as YoTube to do independent learning of English

Table 1. The Category of Participants

| No | Participants | Sex | Year |
|----|--------------|--------|------|
| 1 | R1 | Male | 2013 |
| 2 | R2 | Female | 2014 |
| 3 | R3 | Female | 2014 |
| 4 | R4 | Female | 2014 |
| 5 | R5 | Male | 2016 |

2. Variables

The independent variable is the use of E-Vlog (Video Blog), while the dependent variable is speaking skill.

B. Data Collection

In order to achieve the aims of the study, the authors used three types of data collections; students' interview, observation, and document. The primary data comes from the author in-depth interviews with students in order to know how students' perceptions on the use of English Vlog to enhance speaking skill and their strategies when using E-Vlog to enhance speaking skill. According to [23] the use of interview in qualitative research can provide more useful information, moreover the researcher may have better opportunity to ask participant into depth information. The interview questions were adapted from a research written by Nabila Shamsuddin entitled Perceptions of Students in Using YouTube Videos to Enhance Their Autonomous Learning [24]. In addition, the interview questions is adapted to suit authors' need on investigating students' perceptions and strategies in using E-Vlog to enhance speaking skill. In this case, students need to answer several questions related to E-Vlog as the media to enhance speaking skill according to their experiences by applying one-on-one interview. Besides, through one-on-one interview participant may feel comfortable during interview session.

The interview consists of 15 questions which involve speaking and E-Vlog variables. Table 2 demonstrates the list of interview questions as one of research instruments used by the authors. Furthermore, the authors used bilingual during the interview in order to get more information from the participants easily and deeply.

The secondary data comes from observation and documentation. The observation done by observing students' usage of E-Vlog through their accounts in YouTube while document comes from students' scores in listening and speaking test which conducted by English Education Department of Universitas Islam Indonesia. The authors check students' scores on their listening and speaking subject. It aims to synchronize

students' speaking skills with their scores in speaking subject that they got in the classroom.

Table 2. Interview Questions

| No | Interview Questions |
|----|--|
| 1 | In your opinion, how much the vocabulary that have you mastered? What type of vocabulary are they? |
| 2 | How about your grammar in speaking? |
| 3 | What do you think about your pronunciation? |
| 4 | Do you know E-Vlog? Do you use it? |
| 5 | Who is your favorite vlogger? Why? Or Whose E-Vlog do you usually watch? Why? |
| 6 | What do you think about using E-Vlog to enhance speaking skill? |
| 7 | In your opinion, what are your main reasons to use E-Vlog? |
| 8 | How often do you use E-Vlog to enhance your speaking skill? |
| 9 | What is your strategy to enhance your speaking skill through E-Vlog? |
| 10 | What do you think the advantages of using E-Vlog to your speaking? |
| 11 | What do you think the disadvantages of using E-Vlog to your speaking? |
| 12 | What is your own solution to solve those disadvantages? |
| 13 | How effective does E-Vlog improve your speaking skill? How is your speaking after and before using E-Vlog? |
| 14 | What challenges do you face when using E-Vlog to enhance your speaking skill? |
| 15 | Do you still want to continue for using E-Vlog for the next? |

C. Data Analysis

The technique of data analysis is done by processing the result of interview transcript, observation, and documentation through qualitative method. The authors analyzed the data by using five steps of data analysis by Mckernan [25]. Those steps are: assembling the data, coding the data, comparing the data, building interpretation, and reporting the outcomes. The process of data analyzing as bellow:

1. The authors collected the data from in-depth interview, observation and check document review to know how students' perceptions on the use of E-Vlog to enhance speaking skill and their strategies toward it.
2. The authors categorized the data. In this step the authors organized the data and reduced it through the process of selecting, focusing, simplifying, and transforming the data. To reduce the data, the

authors focused on research questions, which are about students' perceptions on the use of E-Vlog to enhance speaking skill and their strategies toward it. The data were categorized into themes and put the coding. Table 3 shows the table of categorization themes.

Table 3. Categorization Themes

| No. | Code | Theme |
|-----|---------|----------------------------|
| 1 | PEV | Purpose of Using E-Vlog |
| 2 | STR | Strategy |
| 3 | OPP.CHL | Opportunity and Challenges |
| 4 | EXP | Students' Experiences |

- The authors compared the data to see the similarities and differences of the data. It is done by displaying the data in form of table and narrative text.
- The authors interpreted the data after the previous stage, classified into the themes and analyze the data using data analysis on analyzing student' perceptions on the use of E-Vlog to enhance speaking skill and their strategies toward it.
- The authors presented the outcome of the study to answer the research questions and concluded the result of the research.

IV. DISCUSSION

This study produced several important results. The findings of this research explained into two discussions. They are 1) Perception on the use of E-Vlog to enhance speaking skill, and 2) Strategy on using E-Vlog to enhance speaking skill. The explanation of each discussion is below. In this chapter the authors provide the interview code that used to identify the interview data as shown in table 4.

Table 4. The Interview Code

| No | Code | Definition |
|----|--------------------------------|---|
| 1 | Int/R1,R2,R3,R4,R5/P EV | 'Int' (for Interview) means the data is gathered from interview, 'R1/R2/R3/R4/R5' for respondent 1,2,3,4,5, and 'PEV' is the theme, which is Purpose of Using E-Vlog. |
| 2 | Int/R1,R2,R3,R4,R5/S TR | 'Int' (for Interview) means the data is gathered from interview, 'R1/R2/R3/R4/R5' for respondent 1,2,3,4,5, and 'STR' is the theme, which is Strategy |
| 3 | Int/R1,R2,R3,R4,R5/O PP.CHL | 'Int' (for Interview) means the data is gathered from interview, 'R1/R2/R3/R4/R5' for respondent 1,2,3,4,5, and |

| | | |
|---|----------------------------|---|
| | | 'OPP.CHL' is the theme, which is Opportunity and Challenges |
| 4 | Int/R1,R2,R3,R4,R5/E XP | 'Int' (for Interview) means the data is gathered from interview, 'R1/R2/R3/R4/R5' for respondent 1,2,3,4,5, and 'EXP' is the theme, which is Student's Experience |

A. Perception on The Use of E-Vlog to Enhance Speaking Skill

The length of usage E-Vlog to enhance speaking skill of students were varied. It affected to their opinion in answering the questions during the interview. Therefore, their perceptions in watching E-Vlog, the advantages, disadvantages and challenges they found in watching E-Vlog were also different.

In term of purpose in watching E-Vlog, each student has their own goals that allow them to watch E-Vlogs to enhance speaking skills. R1 preferably use E-Vlog because he is a visual learner and the uses of E-Vlog are also authentic and natural. As identified in the interview *"personally, I prefer to learn through visual. I prefer watching in order to enhance my speaking skill compare to seeing people"* (Int/R1/PEV). As for R2 and R4 stated that the use of E-Vlog is very helpful in terms of pronunciation, vocabulary, *slank word*, grammar, and usually what they found from E-Vlog is different from what they found in class. Those perceptions as identified in the interview *"for the first one, because E-Vlog is delivered by native speaker it can automatically help in terms of pronunciation, new vocabularies, and maybe slank words. Also how the native speakers communicate in their daily communication, because what we learn in the classroom maybe different with the reality"* (Int/R2/PEV). *"I want to learn pronunciation and its use in daily communication as well as it can help to improve grammar"* (Int/R4/PEV). According to R3 using E-Vlog more as alternative learning media because it easy to reach through own device. As identified in the interview *"The main goal is as an alternative learning media. Also, everywhere we bring our hand phone, if no one we can ask we can search on the internet or on Vlog"* (Int/R3/PEV). While for R5 the purpose of using E-Vlog is as a hobby that can help to enhance speaking skills. It identified in the interview *"for personal pleasure and not for educational purpose"* (Int/R5/PEV).

The advantages of watching E-Vlog according to most students are quite similar. R1 has started to watch E-Vlog to improve speaking for about three years. According to him E-Vlog plays as an authentic media that can enrich the vocabulary and understanding across

cultures such as jokes and *slank words* that commonly used by native speakers. It identified in the interview *"E-Vlog is unscripted. The example is a joke that used by the native speakers were different to a jokes in Indonesia such a cross culture differentiation"* (Int/R1/OPP.CHL).

As according to R2 and R3 where the usage is approximately four years and three years, the benefits that can be obtained from watching E-Vlog is E-Vlog plays as the fastest media in enhancing speaking skill and enriching knowledge of new words and accents of native speakers such as the accent of American, French or Russian. *"According to my opinion E-Vlog is very fast when used to enhance speaking for example it helps our pronunciation, also we can learn accents like Amerikan, Canadian, even French or Russian English. I learned new words that I had not heard before"* (Int/R2/OPP.CHL). *"The advantages in terms of pronunciation, we can immediately know pronunciation and how to pronounce it correctly. Besides, I'm a person who prefers hearing then reading therefore I think knowledge can be accepted more quickly"* (Int/R3/OPP.CHL). In addition, R4 and R5 had the same perceptions about the benefits from watching E-Vlog. According to them through E-Vlog they can increase their ability to speak English, train listening skills, pronunciation, and enrich new vocabulary. As identified in the interview *"E-Vlog can train listening and speaking"* (Int/R4/OPP.CHL). *"I know a little about vocabulary and how to pronounce it"* (Int/R5/OPP.CHL).

Otherwise, the disadvantages according to R1, R2, and R4 are because the background of vlogger is different compare to Indonesian culture. Therefore, the students were commonly found *'unsuitable words'* that were not filtered by vloggers. It identified in the interview *"Well, the disadvantage may be about the vloggers who cannot filter their language so it really natural and authentic"* (Int/R1/OPP.CHL). *"It is about internet connection issue. If in terms of language is in slank words"* (Int/R2/OPP.CHL). *"Sometimes the content cannot be filtered by my own"* (Int/R4/OPP.CHL). R3s' responds to disadvantage of using E-VLog is the use of E-Vlog is not as interactive as well as in the classroom. For example when students have a question to the vlogger it sometimes takes a long time to find the answer, while in the classroom the students may find the answers directly from the teacher. Besides, the numbers of vloggers' updates are different therefore, users have to wait for the E-Vlog to upload. Another disadvantage of E- Vlog according to her is the

limited of internet connection where this problem becomes a lack of E-Vlog because it could be accessed via internet only. As identified in the interview *"the disadvantage of E-VLog may not be as interactive as in class. For example if we comment in the comment column it cannot be directly answered. Unlike in the classroom it can be directly answered by the teacher. I think it is less interactive and sometimes we cannot force vloggers to upload. Also, personal problems are also present in the internet connection issue"* (Int/R3/OPP.CHL). Unlike the others, R5 did not know many things related to the lack of use of E-Vlog to enhance speaking skills due to he uses E-Vlog no more than one year. *"I think there is the advantage of E-Vlog but I did not know"* (Int/R5/OPP.CHL).

Thus, from the disadvantages above, the solution to the disadvantages and challenges in using E-Vlog according to students could be solved by understanding digital literacy well in order to be able to filter the good and bad information, watching E-Vlog which can boost motivation in learning by selecting good content of E-Vlog, finding out lots of E-Vlogs so it could be an alternative E-Vlog, and looking for free Wifi to handle the limited of internet connection. As identified in the interview *"I think by understanding digital literacy deeply. So, if our knowledge about media is limited, automatically we will take the bad things from E-Vlog"* (Int/R1/EXP), *"Following vloggers whose contents can motivate us. In this case we might be clever to choose E-vlog to be watched and remember our goals is to learn (self-awareness)"* (Int/R4/EXP), *"expand E-Vlog or alternative channel and do not focused on one vlogger only in order to obtain more information and enrich the cultural understanding"* (Int/R3/EXP), *"Usually in the campus or several places which provide free Wifi"* (Int/R2/EXP).

From the observation, it was found that students tend to watch E-Vlog which their favorite vlogger has hobbies and interests in similar with them, while the scores from Listening and speaking subject as show in table 5.

Table 5. Students' Scores on Listening and Speaking Subject

| No | Participants | Scores | |
|----|--------------|-----------|----------|
| | | Listening | Speaking |
| 1 | R1 | A | A |
| 2 | R2 | A | A |
| 3 | R3 | A- | A- |
| 4 | R4 | A | A |
| 5 | R5 | A/B | A/B |

The score above expressed in the form of letters where each has the value. Score A = 4,00 A- = 3.75 and A / B = 3.50. Therefore, all respondents in this research have a good marks on Listening and speaking subject which supported by the use of E-Vlog to enhance speaking skill.

To sum up, watching E-Vlog to enhance speaking skill is effective because it is very helpful in mastering conversations in English, there are always new things that presented or shown by each vlogger to enriching vocabularies and cultural treasures, helping to increase knowledge in term of pronunciation, and improving the ability to understand English language in general. Thus, according to the students they will continue to use E-Vlog to enrich the knowledge related to speaking skill.

B. Strategy on The Use of E-Vlog to Enhance Speaking Skill

There are several strategies used by the students in using E-Vlog to enhance speaking skill as found in this research. Each student had their own different strategies toward it.

The R1 pauses the video when there are some words that cannot be understood then opens the dictionary to find meaning that appropriate to its use in the video. After that she imitates what the native speakers said. The finding is supported by the data from interview *"for example if there is a word that I do not understand, I pause the video first then check my dictionary and understand the meaning. Also, I pronounce how to say the word"* (Int/R1/EXP). R2 also has the same strategy that she pauses the video when finding words or conversations that cannot be understood. Also, she rarely uses subtitles so that she can directly understand the context without the subtitle. As identified *"if there is something I hear from the video and I do not understand it, then I repeat. I also rarely use the subtitles. If I still do not understand I repeat it again"* (Int/R2/EXP). As for R3, the strategy begins with reading the E-Vlog title itself before watching it. If she is curious with the title then she watches the video. *"Initially, I feel like curious with the title. If the title is interesting then I see the video and try to understand it. Also, I search for more sources from other media"* (Int/R3/EXP).

Unlike with R4, after watching E-Vlog she tries to speak English then record it and often imitate what the vloggers said in the E-Vlog. *"I like to speak English then record it"* (Int/R4/EXP). The R5 has a strategy that is by following the conversation or words that he found on E-Vlog then try to converse with his friend using the conversation he found on the video. Also, when he finds

a word that cannot be understood he tries to find the meaning in the dictionary as R1 does. As identifies in the interview data *"if I do not know the meaning of the vocabulary, I will look for the meaning in the dictionary then when I understand it I try to talk with my friends by using those vocabularies"* (Int/R5/EXP).

V. CONCLUSION

Based on the results and discussion above, it can be concluded that the use of E-Vlog as the media to help students' to enhance speaking skill is effective because its usage has many advantages compared to its disadvantages, as for the existing challenges, it could be anticipated and solved by each student. Furthermore, E-Vlog can enrich students with a variety of knowledge about vocabulary, grammar, pronunciation, accent, and knowledge of culture. Thus, students can continue to practice their speaking skills by watching E-Vlog which fits their needs.

Every student has a favorite channel or vlogger which in-lines with the interests and hobbies they have. Among those vloggers or channels are Felix Jelber with his channel *"Pewdiepie"*, Mr. Hamish, Korean Englishman, Taylor R, and Fathia Izzati. Basically, the students chose the vlogger because despite of the vlogger has a good characteristics, the content is also interesting and useful to be watched, the pronunciation is clear, the accent is similar as natives' accents and the E-Vlog offers authentic tool for learning which describes their daily activities .

This paper proved that students' perceptions on the use of E-Vlog to enhance speaking skill are positive while the strategies that used were various based on the results of the data explained above.

REFERENCES

- [1] E. T. Service, "TOEFL iBT® Test," Quality Beyond Measure, p. 7, - January 2015.
- [2] 23 March 2015. [Online]. Available: <https://www.ukessays.com/essays/education/the-speaking-skill.php>. [Accessed 02 October 2016].
- [3] J. S. F. S. C. A. Gretchen Lowerison, "Student perceived effectiveness of computer technology use in post-secondary classrooms," Computers & Education, vol. I, no. 47, p. 25, 2006.
- [4] D. Guy-Phillips, "An Investigation into the Use of Technology Enhanced Learning into Curriculum Delivery in the Educational District of Tobago," The University of The West Indies, Jamaica, 2014.

- [5] D. A. Haryanto, "Students' Perception on The Use Video Animation to Teaching Listening at the First Graders' in SMA Negeri 1 Pakel," IAIN Tulungagung, Tulungagung, 2015.
- [6] A. pramestiya, "Students' Perception on the Use of Powerpoint in Public Speaking Classess," Universitas Kristen Satya Wacana, Salatiga, 2013.
- [7] S. Krishnananda, *The Philosophy of Life, India*: Website: www.swami-krishnananda.org, 1992.
- [8] A. Sobur, *Psikologi Umum*, Bandung: Pustaka Setia, 2003.
- [9] J. Richards, "Cambridge University Press," Cambridge English, 1 April 2016. [Online]. Available: <http://www.cambridge.org/elt/blog/2016/04/01/evaluating-performance-speaking-activities/>. [Accessed 14 May 2017].
- [10] M. C. Florez, "Center For Adult English Language Acquisition," ESL Resources, not found June 1999. [Online]. Available: http://www.cal.org/caela/esl_resources/digests/Speak.html. [Accessed 13 May 2017].
- [11] M. A. D. A. H. D. Marriam Bashir, "Factor Effecting Students' English Speaking Skill," *British Journal of Arts and Social Sciences*, 2011.
- [12] H. B. 2. Gülsen KOŞAR1, "Strategies-Based Instruction: A Means of Improving Adult EFL Learners' Speaking Skills," *International Journal of Language Academy*, p. 2, 2014.
- [13] S. A. E. F. Torky, "The Effectiveness of a Task-Based Instruction program in Developing the English Language Speaking Skills of Secondary Stage Students," *Ain Shams University Women's college Curricula and Methods of teaching Department*, Ain Shams, 2006.
- [14] N. W. Darsini, "Imroving Speaking Skill Through Cooperative Learning Method of The Eighth Grade Students of SMPN 2 Ubud in Academic Year 2012/2013," *unmas-library*, Denpasar, 2013.
- [15] B. O. Gudu, "Teaching Speaking Skills in English Language using Classroom Activities in Secondary School Level in Eldoret Municipality, Kenya," *Journal of Educational and Practice*, vol. 6, no. 35, p. 9, 2015.
- [16] A. N. K. B. Ali Derakhshan, "Developing EFL Learners' Speaking Ability, Accuracy and Fluency," *English Language and Literature Studies*, vol. 6, no. 2, p. 10, 2016.
- [17] K. B. Egan, "Speaking: A Critical Skill and a Challenge," *Calico*, p. 281, 1999.
- [18] S. Meany, "Information Transport Solution," 4 April 2017. [Online]. Available: <http://www.its-networks.com/e-rate-funding-technology-helps-students-learn-in-a-safe-environment/>. [Accessed 14 May 2017].
- [19] C. Kirschner, "What on earth is vlogging?," 08 December 2012. [Online]. Available: <http://www.mnn.com/green-tech/research-innovations/questions/what-on-earth-is-vlogging>. [Accessed 02 October 2016].
- [20] T. Danova, "Business Insider," *Tech Insider*, 5 January 2004. [Online]. Available: <http://www.businessinsider.com/mobile-video-statistics-and-growth-2013-12?IR=T&r=US&IR=T>. [Accessed 14 May 2017].
- [21] E. Baran, "The Promises of Videoblogging in Education," Department of Curriculum and Instruction, Iowa State University, Ames, not found.
- [22] E. Baran, "The Promises of Videoblogging in Education," Department of Curriculum and Instruction, Iowa, 2007.
- [23] J. W. Creswell, *Educational Research*, Lincoln: Pearson, 2012.
- [24] N. Shamsuddin, "Perceptions of Students in Using YouTube Videos to Enhance Their Autonomous Learning," *Academia.edu*, Malaysia, 2014.
- [25] S. P. T. Sari, "The Use of Videos to Improve the Students' Speaking Skills at Class VII B of SMPN in the Academic Year of 2014/2015," *Universitas Negeri Yogyakarta*, Yogyakarta, 2015.

Information Literacy in Rural Community

An Alternative Information Literacy Model in Development Countries

¹Ninik Alfiah, ²Anisa Septiyo Ningtias, ³Nurma Pandwita Utami

Departemen of Library and Information Science, Universitas Airlangga, Surabaya, Indonesia

E-mail: ¹ninik.alfiah-2016@fisip.unair.ac.id, ²anisa.septiyo.ningtias-2016@fisip.unair.ac.id,

³nurma.pandwita.utami-2014@fisip.unair.ac.id

ABSTRACT

Information literacy is a set of competencies such as how to find, use and evaluate information effectively. Information literate people is people who know when they need information, and able to identify, locate, evaluate, organize, and use information effectively to address and help resolve personal, job-related, or broader social issues and problems. In 2013, UNESCO reported the rate of adult literacy among several countries in Asia. It is likely that the adult literacy rate had growth 5% in 2015. However, the current body of literature has shown a dramatic increase in those percentages. Nowadays, information literacy instruction has been adopted in many contexts (health, environmental, education, politic, etc) and the condition of people in rural communities less literate than the urban communities. The aim of this paper was to discuss the appropriate model of information literacy in rural communities. This study assists them to use information in regard to environmental problems, increase their economic value, and rise up their social welfare. This study is based on action research approach. Results showed that information literacy model facilitates improvements in the social welfare through collaboration between community and government along students' participations. The study suggests that collaboration in social welfare is very important and the application of information literacy can help the society to minimize the knowledge gap for their environmental problem-solving and sustainability.

Keywords: *information literacy, rural communities, environment, collaboration*

I. INTRODUCTION

In Indonesia, recorded numbers of disaster incidents until May 2017 show that flood is ranked first at 451 numbers with 203,665 houses are inundated as the impacts [1]. One of the main causes of the flooding is trash in the waterways, thus blocking water flow. It is also supported by the community's unawareness on environmental issues, the rare presence of landfills, shallow rivers, and low soil contour conditions. These conditions indicate a gap in knowledge experienced by villagers in rural area. The existence of people lacking awareness shows that in Indonesia there is still illiteracy in groups of adults with literacy levels influenced by economic status; the family expenses, sex, and place of residence [2].

That phenomenon is related to literacy for to solve it requires considerable knowledge of it. Information literacy generally focuses only on the use of information in the academic environment, but nowadays the information literacy extends into many contexts. One of the contexts is environmental literacy and adult literacy. Rural communities in Indonesia often depend on nature conditions. Sudden nature changes oblige people to update their knowledge of environmental literacy and behavior toward their environment. But rural communities, in fact, have lower literacy than urban communities [3].

Environmental literacy is a form of concern from the people to their environment. Environmental literacy can

improve communities and society creativity through their environment, particularly in Asia rural area with fluctuating natural conditions change which requires a considerate level of environmental literacy [5]. Haverkos & Boutista are the ones who reveal the importance of environmental literacy to be implanted into the society [6]. This brings this paper into the further discussion related to the three literary contexts mentioned before.

This paper examines the model of information literacy that can be planted in the rural community. The literacy models used leads to environmental literacy with the aim of solving environmental problems, increasing economic value, and rise up their social welfare. The environmental literacy program named with *kampung sehat* or healthy village. In addition, our goal is to build a flexible model of information literacy that can be applied in rural communities, especially in developing countries. We look forward to providing benefits with the implementation of environmental problem solutions that have been provided through this environmental literacy program.

II. LITERATURE REVIEW

Literacy has been introduced since the 1960s when literacy was identical with information skills. In the information age, literacy becomes a global competency. The increasing production of information requires the people to be literate in using the obtained information. The presence of literacy is the solution to face challenges and impacts of globalization.

A. Information Literacy

The presence of information literacy is a form of information resources proliferation and its diverse access methods [7]. ALA defines that to be information literate, each individual must be able to know when information is needed, have the ability to locate, evaluate, and use the information effectively [9]. Mackenzie in Lau said that a person can be considered as literate if having these characteristics:

- Prospecting, ability to find relevant information, filtering, sorting, and selecting information.
- Interpretation, ability to interpret data and information into knowledge, insight, and understanding.
- Create new ideas, developing new insights. [8]

This way it can be assumed that information literacy is the knowledge and skills to deal with the proliferation of information resources by knowing the needed information and having the ability to locate, evaluate, interpret, create new ideas, and communicate ethically.

Nowadays, information age provides opportunities and challenges for the future of society in all sectors. Doley argues that information literacy becomes topic that provides means to bring revolutionary change, which is evolutionary transition, in the economic and education [10]. In addition to the economy and education, information literacy has entered a variety of contexts such as health, environment, politics and others. In health context, Guntzviller *et al* conducted research related to the interaction between social cognitive theory, self-efficacy, and capability to predict native Spain behavior living in United States who has low income and English usage ability in preventing sickness. The result is that the combination between confidence and the literacy skills is needed to apply healthy lifestyle behavior [11]. In China, Li's research shows that education of health literacy in rural areas with very few villagers know health literacy will increase their health literacy level and provide important skills in improving their health issues [3]. Thus, it can be concluded that information literacy has occurred in various disciplines in which it can improve society literacy skills to engage them to be critical of any information.

B. Environmental Literacy

The ability of each individual to behave well in their daily life by using his understanding of the environmental conditions is called the environmental literacy. Environmental literacy is not a new discipline or even a new concept in assessing human relationships to the environment. This is a simple thought that departs from the physical determinism, physical possibilism, or even

an anthropocentrism view. Physical determinism is the view that nature has provided everything human needs to live and human beings strive to be in line with existing environmental conditions. In this case, the human does not have many alternatives to determine his role in the environment in which they live. As with physical possibilism, humans have so many possibilities and alternatives to minimize shortcomings of existing environmental conditions. In other words, humans can think and work hard on how to overcome the limitations that nature provides.

Although this term has been widely discussed, there is no generally agreed definition. The initial definition of environmental literacy put forward by Roth says that environmental literacy is the ability to understand and interpret the environment which then brings to take action to repair, restore, or maintain the environment [12]. Finn & O'Fallon says that improving and applying environmental literacy will benefit the community and rural communities and increase environmental awareness for both the individual and the community itself [13]. Haverkos & Boutista concluded that environmental literacy is crucial today; environmental literacy refers to the importance of knowledge and attitudes in understanding environmental issues to make decisions through responsible and sustainable actions [6].

Some experts mention the basic framework of environmental literacy that consists of environmental awareness, knowledge of personal behavior, and real environmental literacy [14].

1) Environmental awareness

NEETF/Roper study found that about 50%-70% of adults have heard environment-related words such as air and water pollution, energy efficiency, solid waste, habitat loss, and climate change. Environmental awareness is a condition of a person familiar with the environment and has an understanding of cause and effect for the environment. The study shows that environmental awareness by itself has an influence on environmental management behavior and environmentally friendly behavior. Environmental awareness of the community will help the government in environmental policy making and management.

2) Combination of awareness and action on the environment

The combination of awareness and action encourages people to take personal actions that directly contribute to environmental improvements such as saving electricity, gasoline, and water, buying "green" products (including seafood choices), reducing solid waste, and so on. It is called the knowledge of "personal behavior" because, unlike environmental awareness, people willingly go further to take personal action and make connections

between environmental issues and their own individual behavior. Experienced people in environmental knowledge level are more likely to engage in private environmental action by taking direct action or campaigns such as energy savings, water, and reducing healthcare costs. Thus, in addition to be environment aware on society level, individual must also take action on awareness to the environment.

3) *Environmental Literacy*

Environmental literacy has a deeper scope than the previous two basic frameworks. Environmental literacy not only focuses on environmental information knowledge but also involves the basic principles of environmental awareness. Then on the skills required to investigate environmental issues and understanding on how to apply that information.

White, Hall, & Johnson studied the U.S community on environmental issues in which 56% of the population left domestic waste not on the right place. The study resulted an educational program related to domestic waste management and the importance of environmental management to the community [15]. Ramirez-Andreotta, et al. found that community concern and understanding community information needs in improving environmental literacy have already changed in waste management and with environmental literacy enhancing environmental knowledge and environmental awareness, a sense of control, and the ability to make decisions appropriate to the existing environment [16].

C. *Adult Leadership Literacy*

Everyone has an influence on the environment at home, workplace, and community. However, research conducted by Coyle showed that leaders in business, government, and society do not have the basic knowledge about the environment and often ignores environmental impacts and opportunities or overcome solely through intuition [14]. Community leaders, in particular, need to be environmental literate for their literacy is vital to the development of environmental literacy through policies and decisions that are influencing society. The policy can exist in from land development policy to education waste disposal. Adults should make informed decisions about the environmental impact of their decisions. Adult literacy is the ability to conduct literacy to the problems faced daily [17]. Adult literacy rate relies on how owned information accessed and participation by an adult in its primary education. Hamilton & Pitt says that adult learners are a priority group. Thus, adult literacy is very important to be increased because it can affect the child literacy.

Barakat measured changes that occur in literacy of women aged 20-49 from 30 countries and the result is with the presence of appropriate literacy program, a

significant increase of the subject to the level of the woman can be said to be literate [17]. While Post did research with a sample of 166,000 adults aged 16-65 in 24 countries on 2008 and 2014, the research resulted that with an integrated literacy in adults can contribute to the social welfare and positive transformation that can be done by adults [18]. These studies show that adult literacy can improve knowledge so that the society become more literate and contribute to social welfare and transformation. In addition, the increase in adult literacy, especially in communities in the marginal category based on research from Akello, Lutwama-Rukundo, & Musiimenta with 45 respondents, has found that adult literacy is most effective when conducted through dialogue in changing social and economic actions [19]. While in this paper, it does not only promote a dialogue to increase literacy in adults and village communities, but there are several formulations and stages have been studied that can increase adult literacy in rural communities.

D. *Rural Community*

Community comes from the Latin word "cum" which means togetherness and "munus" which means giving each other. The community is where people define an important social bond in building an identity, practice, role, in an institution such as family, home, work, government, and more broadly [20]. Wenger defines the community as a set of individuals who share issues, concerns or passions about a particular topic and deepen their knowledge and expertise with continuous interaction [21]. It can be said that the community is individuals who form a group based on their similarity and interest to a particular topic along with the social interaction that occurs within the group which can deepen their knowledge and skills.

The rural definition for decades has not been agreed on. In this paper, the rural community is a community that is located in an area far from the city and has lower access than the city in terms of health, technology, and others. All age groups, including adult, should be able to learn and continue learning through a variety of flexible ways of learning so their literacy can leads to sustainable development [22].

Information literacy is needed in the rural community. More specifically, environmental literacy needs to be assessed and applied to the rural community for assessing the environment and treating their environment. The importance of the application of health literacy in rural communities emphasizes how environmental literacy can improve the economy, health, social welfare which also affects the rural people's live.

III. METHODOLOGY

To find out how literacy program is implemented in the rural community, this research used action research approach. Action research is a research method that takes a problem-solving framework. Denscombe explains that action research have the goal of providing problem-solving and making subsequent implementable guidelines led by individuals and teams, collaborating between teams and groups concerned to improve the way they identify and resolve problems [23]. In its application, this action research goes through several stages: diagnosing, action planning, action-taking, evaluating, and learning which in turn consider future action [24].

Participants of this research are the people of Sumberejo village, Sidoarjo, East Java. Implementation of each activity followed by 50 adults of the villagers. The age of the citizens who received this action between 30 to 45 years and over. The literacy program is given in the form of environmental literacy with the name of the healthy village that runs for 5 months. It was also emphasized that research using collaborative action research has focused on increasing the level of local knowledge in a community [25] by establishing the principle of a relationship and shared responsibility. Collaboration has done in this research between student, government, and community. The collaboration is very important to rise up the social welfare and the application of the information gap for their environmental problem-solving and sustainability.

IV. DISCUSSION

A. Information Literacy in Rural Community: the healthy village program in Sumberejo, Sidoarjo

The Healthy Village Program is an initiated program based on the social and environmental condition in Sumberejo which targeted the adults. The presence of The Healthy Village Program becomes an alternative solution of the problem. The program provides a comprehensive solution, namely socialization: an environmental literacy, implementation: creating a product based on environment and social problem, socialization: how to market product, and evaluation. Therefore, the implementation of information literacy model assists them to use information in regard to environmental problems, increase their economic value, and rise up their social welfare. Here's a picture of the model,

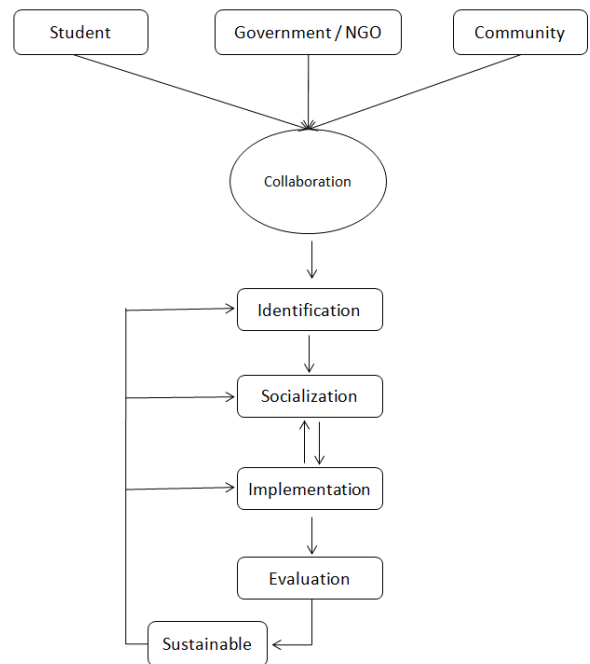


Figure 1. Information Literacy Model in rural community

1) Identification: social setting

In Indonesia, recorded numbers of disaster incidents until May 2017 show that flood is ranked first at 451 numbers with 203,665 houses are inundated as the impacts [1]. While the impact of floods occurred in Sidoarjo in 2016 that thousands of homes inundated for 2 to 10 days [26], and Sumberejo is one of the areas that often prone to flooding [27]. One of the main causes of the flooding is trash in the waterways, thus blocking water flow. It is also supported by the community's unawareness on environmental issues, the rare presence of landfills, shallow rivers, and low soil contour conditions. These conditions indicate a gap in knowledge experienced by villagers in the rural area. The existence of people lacking awareness shows that in Indonesia there is still illiteracy in groups of adults with literacy levels influenced by economic status; the family expenses, sex, and place of residence [2].

2) Socialization: an environmental literacy

The environmental literacy is the ability to understand and interpret the environment which then takes action to improve. [12] Socialization of this program collaborate with The Environmental Agency as known as *Badan Lingkungan Hidup (BLH)* of Sidoarjo and the Department of Hygiene and Gardening as known as *Dinas Kebersihan dan Pertamanan (DKP)* of Sidoarjo. The socialization aimed to provide knowledge and understanding related to environmental literacy to the community. The advantages of environmental literacy are to increase environmental awareness both for the

individual and the community [13]. The education includes maintenance and management of the environment, such as the domestic waste segregation process, the manufacture, and maintenance of biopori. The results of socialization conducted have an impact on increasing public awareness of the environment such as separating domestic waste and initiating the community to utilize domestic waste into economic value. Coley's research result shows that environmental awareness has an effect on environmental management behaviors and eco-friendly behaviors [14]. Haverkos & Boutista concludes that environmental literacy is crucial, where environmental literacy refers to the importance of knowledge and attitudes to understanding environmental issues to make decisions through responsible and sustainable action [6].

3) *Implementation: create product based on environment and social problem*

Coley argued the combination of awareness and action encourage people to take personal actions that directly contribute to environmental improvements such as save electricity, gasoline, and water, buy "green" products (including seafood choices), reduce solid waste, and so on [14]. In the implementation stage of the healthy village program, the rural community applied the results of the socialization in the previous stage, the programs of implementation are:

- Biopori Production and Instalation

Biopori production and installation can be considered as a solution to solve environmental problems such as floods. Biopori installation can absorb the water effectively when the flood comes. It also minimizes the possibility of a flood. The preparation and maintenance of biopori are directly guided by the Environment Agency (BLH) of Sidoarjo.

- Creating Community Creativity

Implementation of socialization and training of waste regulation cooperate with the Department of Sanitation and Gardening of Sidoarjo. The subject of this action is the housewife who is a member of Family Welfare Foster as known as *Pembinaan Kesejahteraan Keluarga (PKK)* in Sumberejo Village. They encouraged to collect plastic domestic waste such as bottles, plastic bags, etc. The instruction as a form of follow-up in applying the education related to waste segregation. For the next step, domestic waste is processed into compost and handicrafts that have economic value. Handicrafts made such as brooches and hanger hoods. In addition, they do the packaging process for their final product.

White, Hall, & Johnson studied the U.S community on environmental issues in which 56% of the population just left domestic waste [15]. This research resulting educational programs related to the importance of domestic waste and environmental management to the community. The implementation stage in the manufacture of products based on the environmental and social problems of the rural community. Assistance is one of the factors that support the success of these communities. This is also stated by Ramirez-Andreotta, et al. that the concern and understanding of information of the community in improving environmental literacy have already changed in waste management [16].

4) *Socialization: how to market product*

The marketing product socialization of creativity community as a form of sustainability of waste processing that has been implemented. This activity collaborates with The Department of Industry and Trade Sidoarjo. The goal is to provide entrepreneurial insight to the local community such as how to do marketing effectively and efficiently and how to build the future strategy for their business development. So that people can market the products that have been made and can be a new business opportunity for local housewives. Product sales results can be an additional income to sustain their economy. In this case, the rural community already knows how the business development process, where they can also implement on other business products.

5) *Evaluation*

This stage is to assess the success of The Healthy Village Program into information use in regard to environmental problems, increase their economic value, and rise up their social welfare. The leaders in business, government, and society do not have basic knowledge about the environment and often ignore environmental impacts and opportunities or cope solely through intuition [14]. In the other side community leaders, need to be environmentally literate because they are the important role in the development of environmental literacy through the policies and decisions that affect people. At the evaluation stage, the formation of environmental community for the sustainability of The Healthy Village Program as a force in managing the environment. The environmental community established from the rural communities.

The implementation of information literacy model in rural communities with applied the healthy village programs that based on environmental and social issues provides a means to minimize knowledge gaps in the completion process. Akello, Lutwama-Rukundo, & Musiimenta explained that increasing adult literacy, especially in marginalized societies, that adult literacy is most effective when conducted through dialogue in

changing social and economic actions [19]. The information literacy model in rural community comprehensively designed not only in dialogue but also providing solutions how environmental literacy can improve the economy, health, social welfare which then also affect the lives of villagers. As in China, in the rural area, people does not aware about health literacy and through education related to health literacy will increase their level of health literacy and provide essential skills in improving their health issues [3]. As a form of building habits in using information appropriately, they are not advised to doubt in transferring such knowledge to different contexts where it has the same value.

V. CONCLUSION

Many literacy programs have been implemented in various contexts. Basically, the literacy activities have applied in rural communities must follow the characteristics and needs of the rural communities. Some researchers have conducted literacy programs, one of them used a dialogue that gives effective results in changing social actions and economic. The Healthy Village Program is an applicative literacy program that can be applied in environmental literacy learning in rural communities. The information literacy model is comprehensively designed based on environmental and social issues in Sumberejo Village. This model has several stages of identification, socialization, implementation, and evaluation of sustainability program. The implementation of information literacy model in rural community facilitates improvements in the social welfare through collaboration between community and government along students' participations. The collaboration in social welfare is very important and the application of information literacy can help the society to minimize the knowledge gap for their environmental problem-solving and sustainability.

REFERENCES

- [1] Badan Nasional Penanggulangan Bencana RI. (2017, Maret 25). Catatan Kejadian Bencana di Indonesia. Retrieved from Badan Nasional Penanggulangan Bencana R: <http://dibi.bnppb.go.id/>
- [2] Jalal, F., & Sardjunani, N. (2015). Increasing Literacy in Indonesia. DDV Internasional.
- [3] Li, X. (2013). Health Literacy in Rural Areas of China: Hypertension Knowledge Survey. *International Journal of Environmental Research and Public Health*, 1125-1138.
- [4] Hamilton, M., & Pitt, K. (2011). Changing policy discourses: Constructing literacy inequalities. *International Journal of Educational Development*, 31, 596-605.
- [5] Hares, M., Eskonheimo, A., Myllyntaus, T., & Luukkanen, O. (2006). Environmental literacy in interpreting endangered sustainability Case studies from Thailand and the Sudan. *Geoforum*, 37, 128-144.
- [6] Haverkos, K., & Boutista, N. (2011). *Environmental Literacy Through Relationships Connecting Biomes and Society in a Sustainable City*. Science Scope, 35, 63-70.
- [7] Bundy, A. (2004). *Australian and New Zealand Information Literacy Framework: principles, standards and practice* Second edition. Adelaide, South Australia: ANZIL.
- [8] Lau, J. (2006). *Guidelines of Information Literacy for Lifelong Learning*. IFLA.
- [9] American Library Association. (1998). *Presidential Committee on Information Literacy: Final Report*. Retrieved May 6, 2017, from <http://www.ala.org/acrl/publications/whitepapers/presidential>
- [10] Doyle, C. S. (1994). *Information Literacy in an Information Society: A Concept for the Information Age*. New York: ERIC.
- [11] Guntzville, L. M., King, A. J., Jensen, J. D., & Davis, L. A. (2017, April). Self-Efficacy, Health Literacy, and Nutrition and Exercise Behaviors in a Low-Income, Hispanic Population. *Journal of Immigrant and Minority Health*, 19(I).
- [12] Roth, C. E. (1992). *Environmental Literacy: Its roots, evolution, and direction in the 1990s*. ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 1-51.
- [13] Finn, S., & O'Fallon, L. (2017). The Emergence of Environmental Health Literacy—From Its Roots to Its Future Potential. *Environmental Health Perspectives*, 125, 495-501.
- [14] Coyle, K. (2005). *Environmental Literacy In America*. Washington DC: Washington Dc : The National Environmental Education & Training Foundation.
- [15] White, B. M., Hall, E. S., & Johnson, C. (2014). *Environmental Health Literacy in Support of Social Action: An environmental justice perspective*. *Journal of Environmental Health*, 77, 24-29.
- [16] Ramirez-Andreotta, M. D., Lothrop, N., Wilkinson, S. T., Root, R. A., Artiola, J. F., Klimecki, W., & Loh, M. (2016). Analyzing patterns of community interest at a legacy mining waste site to assess and inform environmental health literacy efforts. *Journal Environmental Studies Science*, 6, 543-555.
- [17] Barakat, B. (2015). *Improving Adult Literacy Without Improving The Literacy Adults? A Cross-National Analysis Adult Literacy From A Cohort Perspective*. Education for All Global Monitoring Report, 1-31.
- [18] Post, D. (2016). *Adult literacy benefits? New opportunities for research into sustainable development*. Business Media Dordrecht and UNESCO Institute for Lifelong Learning, 751-770.
- [19] Akello, J. A., Lutwama-Rukundo, E., & Musimenta, P. (2017). *Functional Adult Literacy: An Alternative Gateway to Grassroots Women's Improved Income Generation in Lango Subregion, Northern Uganda*. *Adult Education Quarterly*, 67, 79-96.
- [20] James, P., Nadaraja, Y., Haive, K., & Stead, V. (2012). *Sustainable Communities, Sustainable Development: Other Paths for Papua New Guinea*. Honolulu: University of Hawaii Press.
- [21] Wenger, E. (2004). *Communities of practice and social learning systems*. In K. Starkey, S. Tempest, & A. McKinlay (eds.) *How organizations learn* :

- Managing the search for knowledge, Second ed. London: Thomson.
- [22] Incheon Declaration. (2015). Education 2030: Towards inclusive and equitable quality education and lifelong learning for all. Retrieved from World Education Forum: <http://unesdoc.unesco.org/images/0024/002456/245656e.pdf>
- [23] M., Denscombe. (2010). Good Research Guide : For small-scale social research projects (4th Edition). Berkshire, GBR: Open University Press.
- [24] Davison, R. M., Martinsons, M., & Kock, K. (2004). Principles of Canonical Action Research. *Journal Information Systems*, 14, 65-86.
- [25] Styres, S., & Zinga, D. (2013). The Community-First Land-Centred Theoretical Framework: Bringing a 'Good Mind' to Indigenous Education Research? *Canadian Journal of Education*, 36(2), 284-313.
- [26] Badan Nasional Penanggulangan Bencana Kabupaten Sidoarjo. (2017). Rekap Kejadian Bencana (Non Kebakaran) 2016 Kabupaten Sidoarjo. Retrieved March 25, 2017, from Badan Nasional Penanggulangan Bencana Kabupaten Sidoarjo: <http://bpbd.sidoarjokab.go.id/>
- [27] Dewan Perwakilan Rakyat Daerah Provinsi Jawa Timur. (n.d.). Titik Waspada Ruas Jalan Raya Surabaya-Sidoarjo. Retrieved March 25, 2017, from Pemerintah Provinsi Jawa Timur: <http://dprd.jatimprov.go.id/berita/id/835/-titik-waspada-ruas-jalan-raya-surabaya-sidoarjo->

Types of Written Corrective Feedback: Overview of Teachers' Implementation in Indonesia

¹Nirma Paris, ²Sutida Ngonkum, ³Rezkiawati Nazaruddin

^{1,2}Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen - Thailand

³Faculty of Social and Political Sciences, West Sulawesi University, Majene - Indonesia

E-mail: ¹nirma.paris@gmail.com, ²nsutid@kku.ac.th, ³keenadin@gmail.com

ABSTRACT

The present article aims to provide an overview of the written corrective feedback types. It also presents the review of previous studies on the written corrective feedback as well as its effectiveness, especially in Indonesian setting. Written corrective feedback has been provided by the teachers to help the students to improve their L2 writing for decades. The teacher provides the feedback in many ways which include crossing out the errors with or without providing the correct form, targeting the grammatical errors, providing grammatical description of an error, and so on. However, not all of types of corrective feedback offer the same effectiveness. There has been a claim that direct corrective feedback enhances the students' writing accuracy, focused corrective feedback helps the students to acquire grammatical rules of targeted linguistic features, and metalinguistic corrective feedback assists the students to be aware of their errors in which turn to help them in revising their writing. Hence, this paper argues that the combination of direct, focused, metalinguistic corrective feedback can best benefit students' learning. The paper further suggests that the teacher provides the appropriate feedback for the students. Appropriate combination of feedbacks is particularly suggested in this paper.

Keywords: Effectiveness, L2 writing, the teacher's feedback, written corrective feedback.

I. INTRODUCTION

Writing is the process of thinking to create the idea, express it through the sentences into paragraph, organize the idea and revise it to make a good writing [1,2]. Writing in second language (L2) is challenging and has a complex process as it is considered as the most complicated skill to acquire for English as a foreign language (EFL) learners because in completing a piece of writing, learners must be able to have ability to convert thoughts into writing. To further, [3,4] proposed that to present the ideas into the writing form, it is essential to master the writing organization and linguistic knowledge including grammar and vocabulary. In many EFL settings, the students find problems when they are assigned a written task [5]. Their problems in composing the written task is related to the grammatical errors [6,7], generating their ideas respectively in the writing form [8], and the students are not aware of how to write well using coherence [9]. One way to help the students solve their problem is inform them about their own errors [10]. Giving corrective feedback is claimed an effective way as it allows the teacher to provide corrective feedback widely in order to encourage the students to be aware of their errors [11,12].

Corrective feedback is information provided to the students concerning a linguistic error that they have produced [13]. It has been viewed as a hint to the learner that his use of the target language is incorrect [14]. A. AbuSeileek and A. Abualsha'r, [15] stated that corrective feedback is one of the foremost tools to increase English language learning and teaching with the provision of feedback for the students in order to

correct their errors. In addition, C. V. Beuningen [16] proposed that corrective feedback is a tool that foster language learning which help the students to develop their accuracy since it offers them reflection from their linguistic errors. Finally this paper defines that corrective feedback is information given to the students regarding a linguistic error. This kind of feedback is used to indicate the language errors. The indication of language error helps the students to perform a reflection toward their error. The students' reflection helps them to construct the language error and develop accuracy. Finally, they are able to foster their language learning.

SLA literature reveals some benefits of corrective feedback [i.e.17,18,19,20]. The first benefit relates to the writing grammatical accuracy. There has been a claim that written corrective feedback is an effective learning tool that helps the students to write accurately and effectively as it offers them the grammatical notification that allow them to revise their written work [17]. For example, a study of D. Ahmadi, P. Maftoon, and A. G. Mehrdad [21] revealed that the provision of corrective enables the students to use participle phrases and avoid using resumptive pronouns with significantly greater accuracy. The second benefit of corrective feedback associates with idea organization. T. K. D Pham [18] proposed that providing written corrective feedback for the students helps improve the ability of the students to organize their idea in a writing composition. The third benefit of corrective feedback relates to the use of accurate lexicon. N. M. Diab [19] claimed that corrective feedback is effective tools to help the students manage their incorrect lexicons. The fourth benefit of corrective feedback is related to the students'

awareness. There has been claimed that providing corrective feedback makes the students aware of their error [12]. One example was E. Ebadi's [11] study that found that written corrective feedback (WCF) helped the students to aware their own errors as well as monitor themselves. It also indicated that when the students aware of their error, it lead to fewer error in writing as it helps them to correct and revise their errors.

In the literature of corrective feedback, there are effectively three groups of scholars who grouped corrective feedback which are [22,23,24]. This paper presents the late group as it is the updated framework which offers six types of corrective feedback which are direct corrective feedback, indirect corrective feedback, metalinguistic corrective feedback, the focus of the feedback, electronic feedback, and reformulation. Of all types of corrective feedback are popular on the study of written corrective feedback currently across the world. However, the scholars in Indonesia are limited to investigate the particular types of written corrective feedback. This paper aims to present an overview of the written corrective feedback (WCF) types, the previous studies as well as its effectiveness. Finally, it describes the teachers' feedback implementation in Indonesian setting.

II. LITERATURE REVIEW

A. Types of Written Corrective Feedback (WCF)

According to R. Ellis [24], there are six type of written corrective feedback. The overview of these types is presented in the following table.

Table 1: Categories of written corrective feedback [adopted from R. Ellis 24]

| Type of corrective feedback | Description |
|-------------------------------------|---|
| Direct corrective feedback | The correction is provided in a place of incorrect form. |
| Indirect corrective feedback | The errors are identified and indicated without providing the correct form. |
| a) Indicating only | a) An error is notified only in the margin or in a line. |
| b) Indicating the specific location | b) An error is underlined. |
| Metalinguistic | Metalinguistic clue of an error is provided. |
| a) Brief grammatical description | a) A brief of grammatical explanation of an error is delivered at the end of text and numbered. |
| b) Error codes | b) Abbreviation of error codes provided in the margin. |
| The focus of the feedback | The correction is provided for all errors or specified. |
| a) Focused | a) The correction given only on specific or targeted features. |
| b) Unfocused | b) Many or all error correction is addressed. |
| Electronic feedback | Using a computer to point out the error and provide the example of correct usage. |
| Reformulation | A native speaker reformulates the |

1) Direct corrective feedback

The first type of corrective feedback is known as direct corrective feedback. Direct corrective feedback refers to the feedback provided explicitly with the correct form for the students. It indicates that the students make an incorrect form and the correction is provided in a place of the errors. In providing the feedback, the teacher might cross out an unnecessary word, phrase, or morpheme, insert a missing word or morpheme as well as provide the correct form above or near to the error form.

R. Ellis [24] argued that direct corrective feedback has a benefit as it offers the learners explicit direction how to revise their errors. It is essential to provide direct corrective feedback when the learners have no idea about the correct form (i.e. are not capable to do self-correction on the error) as it benefits them to produce the correct form when revising their writing. A study related to the advantage of error correction conducted by K. Rustipa [25] showed that direct written corrective feedback assists the students to increase the revision accuracy of an initial piece of writing effectively in the low level of proficiency. Furthermore, a study of Y. Sheen [12] revealed that direct corrective feedback might be effective in promoting acquisition of targeting a single grammatical feature.

2) Indirect Corrective Feedback

The second type of corrective feedback is known as indirect corrective feedback. Indirect corrective feedback refers to the feedback provided implicitly for the students. It indicates that the student makes an incorrect form by providing notification, yet the correct form is not provided. The notification of the incorrect ones is commonly presented by making circled or underlined the errors. It also might be presented by making a note in the margin next to the line without pointing out the exact location of an error. Thus, this type of corrective feedback allows the students to find out their own error and let them to correct it.

The indirect corrective feedback method is often the quickest and easiest way to perform by the teacher. However, it may be inappropriate for students with limited knowledge of linguistics as they might not understand why they produced the errors and they might not know the location of the errors [26]. In addition, the students require the sufficient linguistic knowledge to correct and edit their own errors in the text. This method may strongly demand error correction especially with low level of proficiency learners and most of the teacher spends a lot of time to code the errors [27].

3) *Metalinguistic Corrective Feedback*

The third type of corrective feedback is known as metalinguistic corrective feedback. Metalinguistic corrective feedback refers to the provision of feedback in a form of a linguistic clue or explicit comment on the targeted error(s). It indicates that when the students make an error, they are provided a clue on how to correct the error one. In providing the feedback, the teacher might use the error codes abbreviated labels (e.g. art. means article error). The labels on the different errors are varied and provided at the location of error or in the margin. In addition, the teacher might provide the students a brief description of grammatical errors. Then, the errors are numbered and the metalinguistic explanation of the errors are available at the bottom of the text.

N. M. Diab [19] investigated the effect of corrective feedback on the student's ability to reduce pronoun agreement errors and lexical errors in new essays. The study revealed that metalinguistic feedback may foster knowledge development and increase linguistic accuracy of grammatical structures. This is in line with N. Shintani and E. Ellis's [28] study that revealed that metalinguistic explanation led to gain accuracy in a new piece of writing and helped the learners to develop their L2 explicit knowledge. Additionally, the learners' self-reports also indicated that metalinguistic developed their awareness of the rule and they were able to use it in revising their original text.

4) *Focused and Unfocused Corrective Feedback*

The fourth type of corrective feedback are focused and unfocused corrective feedback. Focused corrective feedback means providing corrective feedback on the targeted errors (e.g. the article errors), while unfocused corrective feedback means providing corrective feedback on all of the errors or a variety of error features on the students' essay. It indicates that both focused and unfocused corrective feedback are not deals with providing the incorrect form or not, instead of what the targeted linguistic features will be focused on. Having the focused corrective feedback makes the learners be able to examine multiple corrections of a single error which lead them to find out the evidence both understanding of why their essay writing was error and they may acquire how to correct them. While unfocused corrective feedback benefits in addressing a range of errors. This type of corrective feedback might not be as effective as focused corrective feedback in helping the students acquire specific features.

L. T. Lam [29] investigated focused and unfocused corrective feedback. The students were grouped into focused written corrective feedback group, unfocused written corrective feedback group, and the control group. The results revealed that both focused and

unfocused groups outperformed the control group. It also indicated that providing focused corrective feedback successfully improved the accurate use of present and past tenses in the students' written texts, both short term and long term. It is obvious that focused corrective feedback method allows the students to notice the specific type of grammatical errors they made.

5) *Electronic Feedback*

The fifth type of corrective feedback is electronic feedback. Electronic feedback is a strategy of providing feedback by using a computer as a tool to point out the written errors [26]. Examples of electronic feedback are providing extensive corpora of written English, either constructed or simply available via search engines such as Google. The feedback can be accessed through software programs when the students write or it can be utilized as a form of feedback.

Electronic feedback helps learners identify and reformulate the errors [15]. In a study of A. AbuSeileek and A. Abualsha'r [15] examined the EFL students' performance in writing provided feedback using computer. The results revealed that track change, computer-mediated corrective feedback, significantly improved the students' overall test score as it might identify the error and reformulate it. In spite of the fact that using computer tools benefit the students, the majority of teachers has limited resources or desire to access computers for their writing and subsequent analysis [26].

6) *Reformulation Feedback*

The sixth type of corrective feedback is reformulation feedback. Reformulation feedback refers to a strategy of correcting an error when a native speaker reconstructs a second language writer's text to make it sounds nativelike as well as maintains the writer's idea as possible. It has been claimed that the native speaker helps the student to rewrite their idea. The main purpose of this strategy is providing the writers the proper linguistic feature that they may be used to correct their errors.

Reformulation feedback helps reduce the error in writing [30]. In her study, A. L. Ibarolla [30] investigated the errors' reduction in the students' draft through a writing-correction-rewriting. The students were grouped into reformulation feedback and self-correction. The result proved that reformulation is better than self-correction concerning error detection. It significantly had a positive effect on error reduction of those errors. In spite of the reformulation correction benefit, the teachers would need extra hours rewriting the entire compositions which is a much demanding task for teachers [26].

Based on the literature and previous studies, it could be seen in general that corrective feedback helps the learners revise their errors in L2 writing. Having direct written corrective feedback benefits the learners to improve their grammatical accuracy in revising their draft as it advantages in reducing and reformulating the errors. In the situation of having the focused corrective feedback, the learners are able to notice the specific type of grammatical errors that they made and it successfully improved the accuracy of grammatical use of the target features in the students written texts, in both short and long term. In the case of metalinguistic corrective feedback, it may foster knowledge development and lead to increase linguistic accuracy of grammatical structures. Providing metalinguistic explanation also helps the learners to develop their L2 explicit knowledge and they become aware of their errors as well as be able to correct them in revising their original text. The combination of written corrective feedback (WCF) types is presented in the following section.

B. Combination of Written Corrective Feedback (WCF) Types

Currently many scholars have conducted studies in relation to the corrective feedback types in writing. The study that seems frequently investigated by the scholars is comparison between direct and indirect corrective feedback [such as 25,31,32]. Another type of corrective feedback that has been paid attention is the comparison between focused and unfocused corrective feedback [such as 29,17]. Apart from providing the comparison of one type of corrective feedback, the combination of written corrective feedback types also attracts the scholar interest. For example, direct focused corrective feedback [33], direct metalinguistic corrective feedback [12,19], and focused metalinguistic corrective feedback [11]. The first combination of corrective feedback that has been investigated was direct focused corrective feedback. Direct focused corrective feedback refers to providing corrective feedback directly at the location of the error with targeted the particular linguistic features. Direct focused corrective feedback improves the students' mastery of particular linguistic features. F. Farrokhi and S. Sattarpour [33] investigated the different types of written corrective feedback on the accurate use of grammatical forms. Sixty participants were divided into direct focused corrective feedback group, direct unfocused corrective feedback group, and a control group. In the direct focused group, the feedback provided directly on the targeted errors (i.e. the indefinite and the indefinite article). In the direct unfocused corrective feedback, the feedback provided directly at five grammatical features including the English article, copula 'be', regular and irregular past tense, third person 's', and prepositions (e.g., at, in,

on). While no feedback on the control group. The result of the study found that both experimental group, direct focused and direct unfocused showed better accuracy performances on the posttest than the control group. In addition, the direct focused group outperformed the direct unfocused group. Finally, providing direct focused feedback enhanced the students to mastery the linguistic features particularly in the accurate use of English articles in a piece of writing.

The second combination that has been investigated was direct metalinguistic corrective feedback. Direct metalinguistic corrective feedback refers to an indication of an error location and the provision of the metalinguistic comment, either error codes or brief grammatical description that explain the correct form. The combination of direct metalinguistic corrective feedback assist the students to aware of the grammatical rules and improve the grammatical accuracy in writing.

The first example of study was conducted by Y. Sheen [12]. This study investigated the effect of written corrective feedback on intermediate ESL learners' acquisition of English articles. 111 participants were divided into direct group, direct metalinguistic group, and a control group. The first group was provided an error correction that indicates an error location on the students' writing as well as a provision of the correct form in which it either deleted, replaced, or added a linguistic element. The second group was provided correction by an indication of an error location, provision of the correct form and metalinguistic clue which describes explanation regarding the correct form. While no feedback on the control group. The findings indicated that both experimental groups were superior to the control group. However, direct metalinguistic corrective feedback was superior to direct corrective feedback only. The results also indicated that direct metalinguistic corrective feedback proved to be effective in enhancing the students' accuracy. Direct corrective feedback seems to promote awareness as noticing, while direct metalinguistic corrective feedback promotes awareness as understanding. It could be noticed that direct metalinguistic corrective feedback offers a greater level of awareness which simplify learning and it has a superior capacity to take part in language analysis.

The second example study of direct metalinguistic corrective feedback was conducted by N. M. Diab [19]. This study investigated the written corrective feedback effect on the students' ability in order to decrease pronoun agreement errors and wrong word in new essays. Fifty-seven participants were divided into direct metalinguistic corrective feedback, metalinguistic corrective feedback, and the control group. The students on the direct metalinguistic group

received error codes (i.e. “Pr.Agr” for pronoun agreement error and “W.W” for a wrong word) and the teacher also provided the reason why a certain pronoun agreement and lexical terms were considered wrong. The students on the metalinguistic corrective feedback group only received error codes. While no feedback provided on the control group. The result of study found that every group decreased the number of pronoun agreement errors (Pr. Agr.) and wrong word (W.W) at the immediate posttest. In addition, the students who provided direct metalinguistic corrective feedback significantly decreased their grammatical errors (Pr. Agr.). This study revealed that the combination between direct metalinguistic corrective feedback had a greater benefit concerning the students’ language errors. It is also indicated that focusing on the targeted linguistic features helped the students to acquire them.

The third combination that has been investigated was focused metalinguistic corrective feedback. Focused metalinguistic corrective feedback is defined as the provision of the correction directly at the targeted linguistic feature as well as the provision of metalinguistic explanation (the grammatical rules and the example). The combination of focused metalinguistic corrective feedback benefits the students to learn the English grammatical rules on the particular features and aware of their errors in writing. E. Ebadi [11] investigated the focused metalinguistic corrective feedback effect on EFL students’ writing ability. Forty-seven participants were assigned into focused metalinguistic WCF group, and a control group. The participants on the focused metalinguistic WCF group were provided correction directly at the selected linguistic feature as well as the provision of brief metalinguistic explanation was described (i.e. the provision of grammatical rules as well the example), while the participants on the control group provided feedback using traditional method. The result of the study found that focused metalinguistic corrective feedback was superior to the control group in improving Iranian EFL learners writing ability. It is suggested that employing focused metalinguistic feedback led to a significantly fewer errors in writing and assisted the students being aware of their own errors and monitor themselves. Finally, it is indicated that having focused metalinguistic corrective feedback helped the students to acquire English grammar rules from the error that they produced, they became aware of their errors through the comment, and they were able to reduce and correct their own errors.

C. Teachers’ Feedback in Indonesia

Recently, a number of scholars have conducted studies on written corrective feedback in Indonesia. There has been a lot of studies investigating direct and indirect corrective feedback as it attack the scholar

interest. Those studies investigated the writing accuracy (i.e. the use of accurate grammar), and the writing performance (i.e. idea organization and writing mechanism). The students’ writing accuracy and writing performance improved after receiving direct and indirect corrective feedback. However, direct corrective feedback outperformed indirect corrective feedback in Indonesian context.

The first example of study relates to the writing accuracy. K. Rustipa [34] investigated the direct and indirect written corrective feedback effect on the EFL learners’ writing. Thirty students were grouped randomly into direct and indirect feedback group. For the direct feedback group, the correct form and the missing words were provided by the teacher. While for the indirect feedback group, the teacher feedback involved underlined and inserted the codes of the absent and/or the mistaken word. The finding revealed that direct and indirect corrective feedback has potential to increase EFL students’ writing. It is also indicated that direct corrective feedback is significantly effective in increasing the students’ accuracy in composing a Hortatory Exposition text.

The second example also relates to the writing accuracy. F. Farrokhi and S. Sattarpour [35] investigated the direct and indirect written corrective feedback effect on the students’ L2 writing accuracy. Forty-three freshman and sophomore Indonesian students were randomly assigned into two groups; direct WCF group and indirect WCF group. In checking the students’ texts in the direct WCF group, the teacher circled or underlined or crossed out the errors as well as provided the correct form under the errors. While in the indirect WCF group, the teacher only marked the errors without providing the correct form instead of providing a correcting symbol under each error. The findings revealed that the students’ writing accuracy receiving direct WCF significantly improved while those receiving indirect WCF treatment was not. It is indicated that direct WCF has more significant improvement on the students’ writing accuracy.

The third example of study related to the writing performance. T. D. Wijayatiningsih [9] examined the corrective feedback effect on the students’ writing performance. The fourth year students majoring in English Department at a University in Indonesia were involved in this study. They were divided into direct and indirect corrective feedback. The result of the study found that direct corrective feedback is beneficial for improving the students’ writing performance.

The fourth example of study also related to the writing performance. P. Tursina and M. Chuang [36] examined the direct and indirect corrective feedback on EFL students’ writing performance. Sixty college students were assigned into four groups; direct

corrective feedback with low proficiency writers, indirect corrective feedback with low proficiency writers, direct corrective feedback with high proficiency writers, and indirect corrective feedback with high proficiency writers. The results of the study revealed that all groups significantly improved their writing performance. However, it also indicated that both low and high proficiency writers received direct corrective feedback outperformed those who received indirect corrective feedback.

It could be seen that the investigations on the written corrective feedback in Indonesia are limited to

III. DISCUSSION AND CONCLUSION

In the literature of all types of the corrective feedback and the previous studies across the world, the present paper highlights the effectiveness of a single type of written corrective feedback which are direct, focused, and metalinguistic corrective feedback. SLA literature has revealed that when comparing direct and indirect corrective feedback, the direct corrective feedback outperformed the indirect corrective feedback. It is also revealed that direct corrective feedback as an effective tool that helps the low level of English learners' proficiency in revising their essays [34]. When comparing focused and unfocused corrective feedback, the focused corrective feedback is superior to unfocused corrective feedback. It has been claimed that focused corrective feedback is an effective method to promote the students' grammatical accuracy [17,12]. In addition, SLA literature further states that metalinguistic corrective feedback makes the students aware of their errors which in turn helps them correct and revise their errors [12].

In the term of combining types of WCF, it is found that some advantages. The first, when direct and focused corrective feedback are combined, it resulted the students' mastery on the particular linguistic

the comparison of direct and indirect corrective feedback. Those have been done in the tertiary level in higher education. It is clear that most of the result of the study revealed that direct and indirect corrective feedback improved EFL writing accuracy and performance. It is also indicated that direct corrective feedback was superior to indirect corrective feedback. However, there are some other types of corrective feedback that might be implemented to provide corrective feedback for the students in Indonesian setting.

features in a piece of writing [33]. The second, direct metalinguistic corrective feedback is effective method to promote the students' awareness and the grammatical accuracy [19,12]. The third, focused metalinguistic corrective helped the students to acquire English grammar rules from the error, they also became aware of their error errors, and finally they were able to reduce and correct their own errors [11].

In Indonesian setting, most of the teacher implement a single type of written corrective feedback which are direct and indirect corrective feedback. Those types of corrective feedback offer effectiveness. However, combining types of written corrective feedback seems to have more advantages (i.e. direct focused corrective feedback, direct metalinguistic corrective feedback, and focused metalinguistic corrective feedback). Those combinations valued to enhance the students writing ability across the world. Hence, this paper proposes that providing the combination of direct metalinguistic corrective feedback with focusing on the targeted errors is effective method to enhance the students' writing accuracy, to help them acquire grammatical rules of targeted linguistic features, and to make them aware of their errors in which turn to help them in revising their writing.

REFERENCES

- [1] J. Harmer, *How to Teach Writing*. Malaysia: Pearson Education Ltd, 2004.
- [2] D. Nunan, *Practical English Language Teaching*. Singapore: McGraw Hill, 2003.
- [3] C. Coffin, "Theoretical approaches to writing language-A TESOL perspective. In A. Burns & C. Coffin (Eds.)," *Analysing English in a global context*, London: Routledge, pp. 93-122, 2001.
- [4] K. Hyland, *Second language writing*. Cambridge: Cambridge University Press, 2003.
- [5] S. Lee, "Facilitating and inhibiting factors in English as a foreign language writing performance: A model testing with structural equation," *Journal of Language Learning*, vol. 52 (2), pp. 335-374, 2005.
- [6] M. Basri D and A. T. Ampa, "Syntactic errors in descriptive paragraphs by native Indonesian speaking students of English," *International Journal of Linguistics*, vol. 5 (5), pp. 125-137, 2013.
- [7] J. J. Mardijono, "Indonesian EFL Advanced Learners' Grammatical Errors," *K@ta*, vol. 5(1), pp. 67-90, 2003.
- [8] M. Wihadi and I. Martiana, "The effect of teacher's written feedbacks on Indonesian EFL learners' recount writing competence," *Indonesian EFL Journal*, vol. 1 (1), pp. 63- 68, 2015.
- [9] T. D. Wijayatiningsih, "Direct corrective feedback on students' writing performance," *4th ELTLT International Conference Proceedings*, pp. 873-880, 2015.

- [10] N. Paris, S. Ngonkum, and P. Deerajviset, "Teacher's feedback in Indonesian's English writing," *Proceedings: The 63rd TEFLIN International Conference*, pp. 683-691, 2016.
- [11] E. Ebadi, "The effect of focused meta-linguistic written corrective feedback on Iranian intermediate EFL learners' essay writing ability," *Journal of Language Teaching and Research*, vol. 5 (4), pp. 878-883, 2014.
- [12] Y. Sheen, "The effect of focused written corrective feedback and language aptitude on ESL learners' acquisition of articles," *Tesol Quarterly*, vol. 41 (2), pp. 255-283, 2007.
- [13] S. Loewen, "The role of feedback. In A. Mackey & S. Gass (Eds.)," *The Routledge Handbook of Second Language Acquisition*, Malden, MA: Wiley-Blackwell, pp. 24-40, 2012.
- [14] M. P. Lightbown and N. Spada, *How Languages are learned*. Oxford: Oxford University, 1993.
- [15] A. AbuSeileek and A. Abualsha'r, "Using peer computer-mediated corrective feedback to support EFL learners' writing," *Language Learning & Technology*, vol. 18 (1), pp. 76-95, 2014.
- [16] C. V. Beuningen, "Corrective feedback in L2 writing: theoretical perspectives, empirical insights, and future directions," *International Journal of English Studies*, vol. 10 (2), pp. 1-27, 2010.
- [17] Y. Sheen, D. Wright, and A. Moldawa, "Differential effects of focused and unfocused written correction on the accurate use of grammatical forms by adult ESL learners," *System*, vol. 37, pp. 556-569, 2009.
- [18] T. K. D Pham, "Different forms of corrective feedback and their effects on L2 Students' writing accuracy: a case study," *Asian Journal of Education Research*, vol. 3 (1), pp. 10-17, 2015.
- [19] N. M. Diab, "Effectiveness of written corrective feedback: does type of error and type of correction matter?," *Assessing Writing*, vol. 24, pp. 16-34, 2015.
- [20] J. Bitchener and U. Knoch, "The value of written corrective feedback for migrant and international students," *Language Teaching Research*, vol. 12 (3), pp. 409-431, 2008.
- [21] D. Ahmadi, P. Maftoon, and A. G. Mehrdad, "Investigating the effects of two types of feedback on EFL student's writing," *Procedia-Social and Behavioral Sciences*, vol. 46, pp. 2590-2595, 2012.
- [22] R. Lyster and L. Ranta, "Corrective feedback and learner uptake," *SSLA*, vol. 20, pp. 37-66, 1997.
- [23] J. Bitchener, S. Young, and D. Cameron, "The effect of different types of corrective feedback on ESL student writing," *Journal of Second Language Writing*, vol. 14, pp. 191-205, 2005.
- [24] R. Ellis, "A typology of written corrective feedback types," *ELT Journal*, vol. 62 (2), pp. 97-107, 2007.
- [25] K. Rustipa, "The Benefit of Indirect Comprehensive Error Corrections in Improving Advanced EFL Learners' Writing Accuracy," *Proceedings: The 2nd International Language and Language Teaching Conference*, pp. 551-557, 2015.
- [26] Pariyanto, "The effect of corrective feedback on grammatical accuracy in the writing of EFL university students," [Doctoral Dissertation in English Language Teaching]. Malang: State University of Malang, 2017, "Unpublished".
- [27] E. Eslami, "The effects of direct and indirect corrective feedback techniques on EFL students' writing," *Procedia-Social and Behavioral Sciences*, vol. 98, pp. 445-452, 2014.
- [28] N. Shintani and E. Ellis, "The comparative effect of direct written corrective feedback and metalinguistic explanation on learners' explicit and implicit knowledge of the English indefinite article," *Journal of Second Language Writing*, vol. 22, pp. 286-306, 2013.
- [29] L. T. Lam, "The effects of focused and unfocused written corrective feedback on the accurate use of tenses in Hong Kong primary ESL context," Hongkong: The Education University of Hongkong Library Press, 2016, "Unpublished".
- [30] A. L. Ibarolla, "Reformulation and self-correction: insights into correction strategies for EFL writing in a school context," *Vigo International Journal of Applied Linguistics*, pp. 29-49, 2013.
- [31] H. Hashemnezhad and S. Mohammadnejad, "A case for direct and indirect feedback: the other side of coin," *English Language Teaching*, vol. 5 (3), pp. 230-239, 2012.
- [32] C. G. V. Beunigan, N. H. D. Jong, and F. Kuiken, "The effect of direct and indirect corrective feedback on L2 learners' written accuracy," *ITL International Journal of Applied Linguistics*, vol. 156, pp. 279-29, 2008.
- [33] F. Farrokhi and S. Sattarpour, "The effects of direct written corrective feedback on improvement of grammatical accuracy of high-proficient L2 learners," *World Journal of Education*, vol. 2 (2), pp. 49-57, 2012.
- [34] K. Rustipa, "The effectiveness of direct and indirect written corrective feedback in improving EFL learners' hortatory exposition writing," *Proceedings: The 61st TEFLIN International Conference*, pp. 625-628, 2014.
- [35] Y. P. Kisananto, "The effect of written corrective feedback on higher education students' writing accuracy," *Jurnal Pendidikan Bahasa dan Sastra*, vol. 16 (2), pp. 121-131, 2016.

- [36] P. Tursina and M. Chuang, "Direct and indirect corrective feedback on EFL students' writing performance," Proceedings of the 1st English Education International Conference (EEIC) in conjunction with the 2nd Reciprocal Graduate Research Symposium (RGRS) of the Consortium of Asia-Pacific Education Universities (CAPEU), pp. 209-214, 2016.

Peruweren System : Local Wisdom Manifestation For The Gayo Peoples

Nur Lailiya Hartanti¹, Armaya Akbar Fitra Sirait²

¹Historical Science, Universitas Airlangga, Surabaya, Indonesia

²English literature, Universitas Sumatra Utara, Medan, Indonesia

E-mail: Nurlailiya.hartanti@gmail.com ; Armayafitra@gmail.com

ABSTRACT

Peruweren was known as a farm system which use the buffalo and let it survive by itself the wild. Some facts showed that the system is becoming obsolete because insistence on a variety of things, including the insistence on a policy to modernize the farm system. Peruweren System is a manifestation of local cultural values that contain traditional wisdom about raising wild buffalo of the Gayo people who reflected the condition of the social and cultural system and environment in order to protect this local wisdom, so that the identity of Gayo's in Gayo Lues will saved. Peruweren manifestations can be seen from the values of traditional wisdom which implemented by the rules on cooperation and mutual openness and believeness. In peruweren system, buffalo gave credence to breeders maintain buffalo in large numbers. There is a cooperative relationship with the level of high trustness between owner and buffalo breeders which trusted by farmers will bring a good values for the livestock. Data needed in this research will obtained through observation, interview and using the technique of Focus Group Discussion (FGD).

Key words : Peruweren, local wisdom, Gayo peoples

I. INTRODUCTION

Almost all cultures also have their own systems in supplying the availability of food with protein elements. The system is in line with the food supply system which contains carbohydrate elements. Ancient human civilization who used to *food gathering* which carbohydrates and protein as a consistent element consumed simultaneously. From many production systems of animal protein sources owned by ethnic groups in the archipelago. One of them is buffalo livestock systems (Kerbau Lepas Liar) in Gayo Lues, Aceh. That system is known as *peruweren*

As long as the development of population and needs, *peruweren* began to be abandoned.. The existance of buffalo in Gayo Lues is not only as source of protein, but also as social value. Buffallos are released wildly in the forest and if there is a need from owner, they called the buffalo to be collected in order to be sold or consumed. Every group of livestock which released in the forest is handled by a "handler". Often the owner of the buffalo also has double job as handler, who can tame the buffalo released in the forest.

The process of collecting Buffalos is also followed by mystical rituals, such as burning incense and making *selengsung*. Buffalos which release for several years could be called back by the handler. In many stories it is mentioned that the buffalos released by their owners in the forest can not be caught by anyone beside the handler. Referring that, the effort to develop a *peruweren* becomes a relevant thing in supporting the sustainability of protein for public

consumption. In addition, The function of *peruweren* is as savior for the Gayo peoples from insistence on economic needs. In the middle of the globalization, *Peruweren* is relevant to answers the age.

II. RESEARCH METHODS

A. Data Collection

Primary data were obtained through in-depth interview techniques and participant observation which aimed to capture information about *peruweren*, also sharpened by focus group discussion technique (Moleong, 2000). This FGD technique is used to derive a strategy to revitalize the *peruweren* livestock system in Gayo community based on more applicable local wisdom that allows to be developed in the context of broader community empowerment by conducting conditioning with local contexts.

B. Research Sites and Data Analysis

The research location is set in the hilly area of Gayo Lues. Gayo Lues as a district which some people still maintain *peruweren* as a buffalo breeding system, so local wisdom becomes something very urgent for people in Gayo Lues. The determination of the location of the study was purposively: Gayo community with the greatest potential of local wisdom, especially some villages in Teragun sub-district (Desa Kuta Sange) and Pining (Desa Gajah).

This observation used simultaneously analysis method combined with cultural ecology analysis, which the concepts and theories could be different from the

situation in the observation area. Every new information will be drawn inferences, so the inferences are used to build and sharpen the another questions. This analysis is carried out following the process, among others: presenting the data and drawing conclusions based on the presentation of data performed during the data collection process takes place.

III. RESULT AND DISCUSSION

C. *The Peruweren System On Gayo Society : Past and Present*

In Gayo society, buffalo is a livestock used for plowing rice fields. The Peruweren system in Gayo Lues is centered in Elephant Village. Buffalo owners took it from Blangkejeren City and Lintang City, where the two cities were rice fields requiring buffalos to hijack rice fields. However, the limited land to release the buffalo, then the Elephant Village became an option to carry out pureweren to release kerbunya on a vast expanse of field.

In the Gayo society, this way of is called *peruweren* (a cage specifically used for buffalo cattle). *Peruweren* is a Gayo society farming system by grazing cattle in the middle of the forest and away from the settlements. There are several points of *peruweren* in Gayo which the average can be reached by 2-3 days on foot. In addition to the number of farm animals that can reach hundreds of amounts is not possible if transported by modern means of transportation. This will also affect the enormous of the production costs. This condition will certainly not worth the cost of livestock production. This system is done Gayo society at the time the community is in cultivation or agricultural season. The farm here is rice. Farms that have been pastured into the middle of the forest (*peruweren*) are left to feed itself and will be taken back after the rice harvest season.

In the historical development of Gayo's culture, the *peruweren* system is not only manifested into the fulfillment of food needs, but also into the form of traditional wisdom. One of the manifestations of traditional wisdom can be seen from socio-cultural values that are implemented in the rules of cooperation and mutual openness and mutual trust (Putra, H.S., 2008).

Putman, 1993 in Gonner, 2001, said that the sets of that local wisdom serve as a set of values, norms and mutual trust that enable a group of citizens to cooperate effectively and coordinated in achieving their goals. In a *peruweren* system, buffalo owners give trust to the breeders who keep the buffaloes in large numbers. Trust is given when the breeder has a kinship relationship with

the owner as evidenced by regional ties. The bond of kinship is not only established on the basis of blood relations and marriage, but can also be related from the aspect of the place to live.

The average breeder is a believer of the buffalo owner. Buffalo owners never worry about losing their buffalo. This mutual cooperation is the foundation of awakening trust among peers. Fukuyama (1995) in Myers OE (2005), states that trust is one of the social capital of society. Where a country with a high-trust society will be able to achieve higher economic success when compared with a lowtrust society.

IV. CONCLUSION

Peruweren system is a manifestation of local wisdom inherited from generation to generation in the frame of social capital of gayo society. Gayo people prefer buffalo farmed instead of oxen or sheep. There is a correlation between buffalo and the price of buffalo investment is more expensive than oxen and sheep. In addition, buffalo is useful to Plowing vast rice fields in Gayo Lues this particular in *Blangkejeren* area. Buffalo is an animal that fits perfectly with the job of plowing different fields with cow or oxen that do not like mud.

Peruweren manifestations can be seen from social-cultural values that are implemented in social capital in the form: rules about cooperation and mutual open and trust each other. In a *peruweren* system, buffalo owners give trust to the breeders or handler who keep the buffalo in a lot quantities. Trust is given when the owner of a buffalo has a kinship relationship with a breeder or handler. Proved by regional bonds.

REFERENCES

- [1] Ahimsa-Putra, H.S. *Ilmuwan Budaya dan Revitalisasi Keraifan Lokal Tantangan Teoritis dan Metodologis*. Makalah disampaikan pada Rapat Senat Terbuka Dies Natalis ke-62 Fakultas Ilmu Budaya UGM. Yogyakarta. 2008.
- [2] Dear CE, Myers OE. *Conflicting Understandings of Wilderness and Subsistence in Alaskan National Parks*. Society and Natural Resources. 2005.
- [3] Gonner C. *Pengelolaan Sumberdaya di Sebuah Desa Anak Benuaq: Strategi, Dinamika dan Prospek : Sebuah Studi Kasus dari Kalimantan Timur, Indonesia*. Eschborn. Deutsche Gesellschaft für Technische Zusammenarbeit. 2001.
- [4] Moleong, L. J. *Metodologi Penelitian Kualitatif*. Bandung: PT. Remaja Rosdakarya. 2000.

From Museum for Java Culture (Management Information System in Ullen Sentalu Museum, Yogyakarta)

Nurul Chamidah¹, Dedet Erawati², Endah Nurhawaeny³

¹Extention and Communication Development, Universitas Gadjah Mada, Yogyakarta, Indonesia

²Faculty of politics and social science, Swadaya Gunung Jati University of Cirebon,, Jawa Barat, Indonesia

³Economic Faculty, Muhammadiyah University of Cirebon, Jawa Barat, Indonesia

E-mail: ¹nurul.chamidah@umc.ac.id ; ²deblume@gmail.com ; ³endah_nk@yahoo.com

ABSTRACT

Ullen Sentalu Museum is museum which shows art and java culture from Mataram Islamic kingdom. This museum is awarded as the best museum in Indonesia from national geography and trip advisor. This museum is founded with the purpose to show the tangible and intangible heritage. One of the purposes is how the children of king live in palace in order to be good sample.

This research uses descriptive qualitative method. Data were collected through observation, documentation studies, and indepth interview with administrator and visitors. After that, the data had been reduced and generalized before being presented in descriptive analysis result.

From the result of the research shows that UllenSentalu museum has new paradigm as modern focusing to essential and purpose of java culture preservation. Decoration system is artistically dominated. UllenSentalu Museum shows the new concept of integrated information system from professional guide as the main source of information. The other complementary from preservation purpose is integrated information system management giving description related to facilities, collection and promotion, art hint, discussion research presentation about art and culture by their official website. In addition, information system is implemented by creating a video of museum profil on youtube. Reviews from tourism sites on google which places the museum in the top rank makes visitors know, interested, and visit this museum. Furthermore, information management system needs to develop. Therefore, the service colomns which are not available can be filled and there will be an effective Interaction between users and manager.

Key words : ullen sentalu museum, management information system, Java culture.

I. INTRODUCTION

Museum holds important character in social life and culture in our society. Museum is place for different generation to look, studying and interaction with culture progress, history and technology in another shape.

But society perception about museum in Indonesia still reputed that museum is some old building who constitute place keep something ancient and did not use again with public society. This is occur because the information about museum our society seldom know about that. Although many activity in order to society become public institute service.

Because of that, master of museum make serious efforts to increase old paradigm become new paradigm until society want to visit museum for study. Museum concept the new terminology museology is terminology which do to explain new phenomena in the museum activity which is more priority society importance (people centered). The most fundamental between old museology and new is if you old

museology (traditional museum) too focused with methodology, like collection method, treatment and fair, so new museology (modern museum) more focused with meanings and purpose. According to Stam in the Corsane, [1] the different at the rise of the role of information who become the main priority in vision and mission of museum (information centered), beside connection with social factor, economy and politic around there (societal environment).

Starting from paradigm like that, Ullen Sentalu museum located in area special Yogyakarta developing new paradigm that is the antithesis from before this paradigm. The new paradigm can be a implementation of new museology that is now being to revitalize the state of many museums who torpidity. The applicability of as the museum modern that makes the Ullen Sentalu museum crowned as the best museum's in Indonesia according to the "TripAdvisor Travelers" Choice Attraction at 2013 and Indonesian national geographic at 2015.

Some research shows that this museum is long note of scores java culture continues to be preserved.

Ability always holds out and adjust, make Ullensentalu museum become some of museums always visited. Kaswargan Ullen Sentalu park or most famous with Ullen Sentalu museum designate and introduced Java culture story for learn and practice in live [2].

Some of the success Ullen Sentalu museum become the best never forget guide from management information system who they manage. Management information system is signal procedure processing data who developing in some system integration for give information become take basic decision. This system combine human and machine for present information for support function management operation and take decision in the organization [3].

Management information system (MIS) spring from management of information system who usual shortened MIS. MIS is knowledge who study kinds of manage work information with use approaching system that based on principles management. Management is process manage activity of human resources, material and method (3M: man, method and material) based on functions management in order to purpose have arrived with efficient and effective.

At this reset, will be explain how to management system information who doing by Ullen Sentalu Museum until giving information to visitor and public reached. Beside that this reset to know about problem in the management information system Ullen Sentalu Museum.

II. METHODOLOGY

This research using descriptive qualitative with collecting data from of observation directly in the museum. Beside that deep interview doing to museum organizer who vice by museum founder at once leader of museum, Mr. Daniel Haryono about information management which they found. Documentation doing with information system museum be paid original website, YouTube and searched Google. Beside that channel of social media about Facebook, Instagram, and twitter, and another media. After collecting data, and then reduction and generalization and showed by analysis descriptive.

III. RESULT AND DISCUSSION

Museum Profile of Ullen Sentalu Museum

Ullen Sentalu Museum founded and managed privately by Haryono family that they are as relative of Keraton Surakarta and under control by Ulatung Blencong foundation. The founder of this museum took a long time from 1997 to 2012. This museum is

inaugurated by governor of Yogyakarta province Sri Paku Alam VIII in March 1st 1997. The process of building taking a long time because they have completely in concept to build modern museum. The process of building stops several times because of Merapi mouth earthquake explodes in 2010. This museum is so far 27 KM from the central of Yogyakarta and the length this museum is 11.990 m²

The first purpose of museum building is from Haryono family in Batik collector from abroad. This museum is trying to present history and classical Java art. It is related to daughters and sons of Keraton as life subject that is very interesting then aspect educative that is so positive values.

Ullen Sentalu museum name is acronym from *ulating blencong, sejatine tataran ning lumaku* that is the shining of life. This museum explains the concept from four kingdoms in Java that is Keraton Kesultanan Yogyakarta, Keraton Kesunanan Surakarta, Kadipaten Mangkunegaran dan Kadipaten Pakualaman. This museum has vision to enrich art and culture kept and valued by the next generation, so the part of the history and metamorphosis of culture and art in Indonesia especially in Indonesia. It can be used for the generations by generations while the purpose of this museum is to keep the antique collection of Pre-history of Nusantara and focusing on the woman as the source of the inspiring art and culture.

As a modern museum, Ullen Sentalu museum keeps trying to shift meaning in museums that are not just storing objects but focusing as a preserver of Javanese culture by showing museums that have activities such as conferences, immigration discussions and so on. One of the popular causes of Ullen Sentalu Museum is that it not only exhibits a tangible heritage, but also exhibits a collection of events and stories that are intangible heritage. Besides, the collection in the museum is chosen based on the theme and a certain concept. This is not like the general museum in Yogyakarta Special Region, the order of the exhibition is still object-oriented. The thematic concept makes every exhibition space in Ullen Sentalu Museum represent the image or image according to the theme of the exhibition collection. Special Other, the exhibition space is also equipped with the concept of art and culture architecture that blends with nature (art, culture, and nature) [1].

Some of the top collections of this museum is the story of one of the princess of the Palace of Solo Mangkunegaran Gusti Nurul Kamaril Ngarasti Kusumawardani. Collection about Gusti Nurul got a special room named the princess room. Gusti Nurul is

the most interesting story, because he is one of the stylized Javanese stylist princess figure that surpasses his time but still preserves Javanese culture like classical Javanese dancing, kebaya dress and curl hair. Because of this beauty he earned the nickname of Queen Wilhelmina as *Kembang Mangkunegaran*. He has a strong personality to oppose polygamy. He even refused an application from Ir. Soekarno (first president of Indonesia), Sutan Syahrir (first Prime Minister of Indonesia) and he rejected the proposal of Sri Sultan Hamengkubuwono to IX became queen of the Kingdom of Yogyakarta. But he eventually married at age 30 with Indonesian Army officer Soerjo Soejarso, and remains the only one to the end of his life.

This museum has 3 parts namely *Guwo Selo Giri* which means mountain rock cave is located within a depth of 1.5 meters below the ground. The following is a *Bale Kambang* showroom which means a floating hall in the form of a labyrinth that connects one room with another room with different themes, and before entering the last room will pass the *Retja Landa* Corridor that showcased the statues of Hindu and Buddhist gods of the 8th century Masehi, and space *Sasana Sekar Bawana* is the last room.

Visitors to this museum, not allowed to bring food or drink, are prohibited from touching museum collections and are not allowed to take pictures at the museum and selfy with museum collections. It is meant that visitors remain focused on following and understanding what the tour guide delivered. The management of the museum has also provided some special locations that are allowed to take pictures together or selfy. Visitors will also be given time to rest a special room while enjoying the traditional herb java drink that *Wedang Ratu Mas* (Royal Queen Drink). The process of visiting the museum only ranged for 50 minutes only, this is to minimizing time and focusing visitors in enjoying each collection. At the end of the trip the visitor can buy souvenirs in Djawa Bazaar & MUSE also Beukenhof Restaurant & Café with classic european style.

Management Information System in Ullen Sentalu Museum

In Indonesia, the presentation technique in the museum is still often left behind by other ways of presenting the media of culture, such as mass media, television, commercial advertisement which all try to approach the public and its consumers. In addition, the exterior or image of the exterior and architecture of the museum building for the common people has caused a feeling of alien. The museum's buildings seem to be

closed and look haunted, in an environment that is not interesting at all and does not reveal the circumstances to come to visit the parts of parts in it. This will be in contrast to the open constructed building which from the outside has already appeared as from its contents.

Management information systems conducted by the Ullen Sentalu museum begins with the establishment of the concept of a modern museum. In the study of museology, modern museum is a blend of the concept offered with the museum material that is prepared. According to Haryono (2011) Ullen Sentalu museum is always following the points of the concept of modern museum and has the concept of a museum collection that is different from the general museum concept. The pictures of the concepts and collections of the museum are as follows:

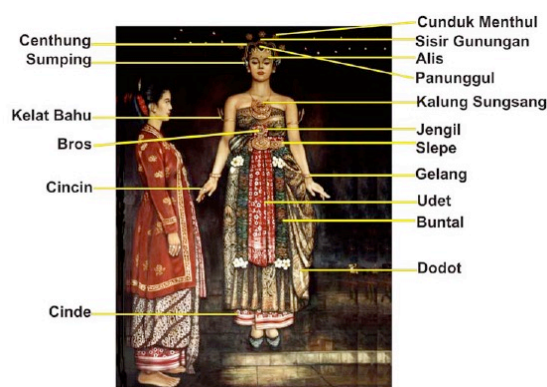
First, the museum is located in a mountain resort rather than downtown and does not occupy a Classic-style heritage building that is usually a museum landmark, but occupies a new building in an empty landscape built in Post-Modern style. *Second*, character as eclectic collection based on themes rather than encyclopedic collections that rely on massive quantities. This museum is not object oriented but information oriented because it is more meaningful of cultural heritage in the form of story (collective memory) or intangible heritage event and not always rely on tangible heritage. *Third*, No use label or caption for Describes the collection on display but rely on tour guides, making it more interactive because it can be accessed visibly and audible. *Fourthly*, Museum is no longer muse-um (muse-ment) but develops into a-muse-ment (theme park) by combining elements of education and entertainment or learning and leisure. *Fifth*, In the final stage (ultimate goal) Become a living museum and not a 'dead' museum by organizing various programs and exhibitions

The painting collection at Ullen Sentalu Museum is in the form of a large size painting and has a peculiarity because it is painted by a special team from the museum. Conceptual and Imaginary Narrative Painting or abbreviated Conceptual Painting is a form of painting based on the thoughts derived from knowledge through writing, narrative or experience see directly an event which was then expressed in the form of painting. Conceptual ideas are further interpreted imaginatively and narratively to display the value of aesthetics and communicative aspects. This painting is used as a medium of communication from the intangible to the tangible.

An example is the *Jumenengan* ceremony which is an annual celebration commemorating the

throne king that can only be attended or witnessed by *keraton* relatives and guests of a certain invitation. Through conceptual painting, all the splendor and beauty of the royal court ceremony along with the philosophical rules contained in it can be expressed to the general public.

Similarly, in his disclosure never include a label or description of the painting, but only through the narrative guides (guided tour) which is actually able to provide information more informative, narrative and interactive than text or caption label. Because the cultural meanings conveyed verbally are often more 'original' than non-verbal which may be distorted by interpretation through writing.



Musealisasi Memory Paes Ageng
Picture 1. Sample of Musealization Paes Ageng
(Haryono, 2011)

Examples of conceptual paintings and the process of musealisasi non-object cultural heritage, one of which is the painting Princess Bride Paes Ageng Kraton Ngayogyakarta Hadiningrat. The philosophical meaning which is the musealization of the primary context in this painting is not a tangible label but delivered by the curator in a narrative way, so that the visitor can concentrate on an uninterrupted object with text that must be read and repeatedly matched to the object.

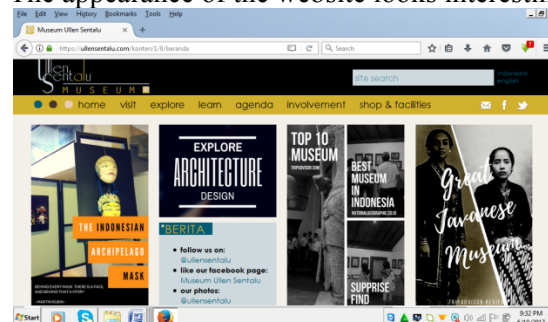
From the results of observations and opinions from visitors to Ullen Sentalu Museum they feel satisfied with the exposure of the tour guide explaining intangible heritage of the collection of this museum. Tour guide is the focus of information strength of the museum. To get a professional tour guide, museum managers do recruitment (Human Resources) cooperation with the faculties relevant to the needs of the museum, cooperation with relevant agencies, through the media by opening vacancies. The tour guide is given training and understanding of Java

culture first and communicative explanation, even the museum provides a tour guide for foreign languages.

Information System Supporting Media

Website

Supporting information system is realized with the website owned by the manager with the site address www.ullensentalu.com. In this website visitors can choose an explanation in Indonesian or English. The appearance of the website looks interesting.



Picture 2. Legal website of Ullen Sentalu

Views of the website there are several link that contains home, visit, explore, agenda, learn, involvement, shop and facilities. Visitors of the website can immediately see some pictures of museum collections. On the right there is a photo of Royal Queen Ageng and Gusti Nurul photo collection. Other columns is about the achievement of Ullen Sentalu Museum as the best museum in Indonesia. The next column is cruising the design architecture and also the social media links related to museum information can be followed by visitors. Starting from twitter, Facebook and instagram.

The results of observations show that the overall content of the website less up date. Proved by sharing the display of information that has long not been updated as the development of museum is approximately three years of this overall website content is not updated. This is certainly very worrisome, because not when viewed from the data visit and also the agenda of the museum show a trend that is very promising and growing.

According to the head of the museum, the look of the website is made more conservative because of the decision of the board of Ulatung Blencong Foundation. As for these administrators are the close relatives representing the four palaces as well as some national figures? The website's appearance illustrates that the museum is more impressed for passive with quiet depictions and guidance. The performance of

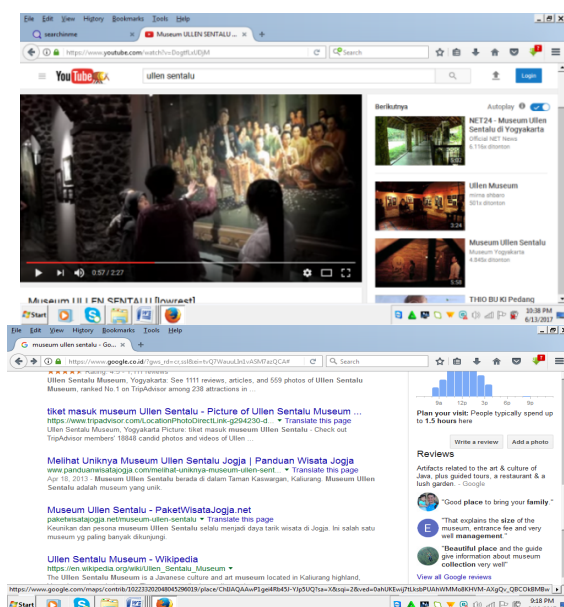
website is also made not attractive to display the impression of elegance and enter all the classes.

Ullen Sentalu Museum activities is actually quite a lot. Documentation team that numbered six people and assisted volunteers still cannot synergize with one staff who deal with social media. This is because the publication team has activities outside the room and outside the area enough energy. As a result the data has not been processed and stacked.

Publication of activities conducted through social media in the form of Facebook, twitter, Instagram that has had followers in large amount. Even every time the event organizing conferences and discussions, then managers use social media as a means of socialization and publications can bring more visitors.

Managers are aware that the shortage of experts who focus on taking care of the official website of the museum to be a factor that causes less communication website content. While notes for the board of the foundation is the effort to enable and revive the material or content in the website to be more communicative and up to date.

Given the important role of communication technology in bridging the relationship between museum managers with museum lovers. So with the appearance of a good and informative website, then the opportunity to introduce the museum and make it attractive to tourists will be greater. In addition, the official website will make it easier for managers to be able to report interesting and latest things from the museum, such as the latest collection or activities nearby Google and Youtube

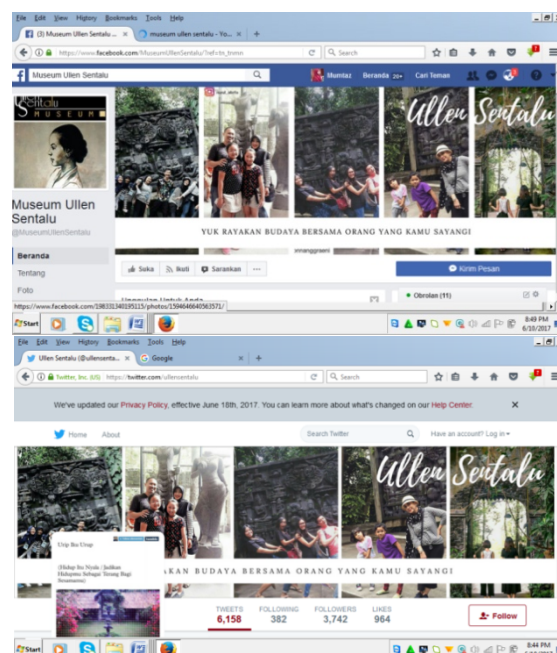


Picture 3. The museum profile in youtube and google

Ullen Sentalu Museum has audio visual media in the form of Ullen Sentalu Museum profile uploaded on the Youtube video site. With the address [linkhttps://www.youtube.com/watch? V = DogtFLxUDjMswest2](https://www.youtube.com/watch?v=DogtFLxUDjMswest2) minutes 27 seconds. In addition to officially-owned museum profiles, this museum also has another museum profile that collaborates with the tourism and cultural office of Yogyakarta Province.

Yogyakarta which is located at the link <https://www.youtube.com/watch?v=HdtaQV0qda0> with a duration of 5 minutes 57 seconds. In addition, Indonesian national television broadcasted and reviewed the profile of Ullen Sentalu Museum. So indirectly the wider community can know carefully what is Ullen Sentalu Museum. But there is no official profile video of the museum is a foreign language narrative such as English.

Even the National Geographic and Google Advisor reviews put Ullen Sentalu Museum as the top ranking, so the search results on google also support the publication of this museum. Visitor comments are displayed on the right hand side of google screen display to be a blessing and the most effective free publication for the museum. Therefore as a form of appreciation, the two institutions are featured in the official website of the Ullen Museum sentalu in the column are in the segment of the quotation. Supporting Social Media (twitter, facebook and instagram)



Picture 4. Ullen Sentalu on facebook and twitter

If the official website is displayed and managed conservatively then the appearance and management of social media in the form of twitter, facebook and instagram with the segmentation of young people are made more active and attractive. Almost every day update this social media status. Media social account status is about the knowledge of Javanese art and culture, the history of ancient kingdoms as well as some publications from studies, conferences and discussions. With a lot of followers, the Ullen Sentalu museum not too busy in terms of massive publication activities.

The followers of social media accounts of the Museum of Ullen Sentalu are mostly followed by a community of art and cultural concerns, such as art students and cultural and historical lovers. So publications for the general public are very limited.

Barriers In Information Management

As a museum with the best predicate in Indonesia, Ullen Sentalu has a big consequence with the number of visitors who come to this museum. According to data more than 10,000 visitors each month who came. Even during the IdulFitri holidays and school holidays, visits can even triple.

Visitors who have made a reservation are given a schedule for the hour of their visit. This is done to maintain the order and the comfort of the visitors, so the atmosphere remains organized. Although as a renowned museum, UllenSentalu still allocates free visits from schools who volunteered to study to the museum about 5 to 6 bus per day. This free visit not only for schools located in Yogyakarta alone, but also other areas.

Although Ullen Sentalu presents various collections that are closely related to Javanese culture. Yet in addition to Javanese nuance, Jawapun spirit and philosophy are included in their management system. According to Daniel Haryono, they use Javanese "*sitik edhing*" philosophy which means little and share. This philosophy implies that life must be shared. Despite ego and lust, Ullen Sentalu museum could have received as many visitors as possible but this is not good. The convenience of visitors will be awful due to overcrowding and dominance of other museums will also occur. With this limitation, visitors can visit other museums, such as Sonobudyo, Merapi Volcano Museum, Yogyakarta Palace Museum, etc. Publications through seminars and museum exhibitions organized by the government, reduced their participation with reasons to share opportunities for other museums to perform.

Museum managers also do not use flayers or posters that are disseminated at the hotel or airport remembering without such publication the visit to the museum ullensentalu is more than enough. However, the museum also did not close the possibility to create a poster and flayer when visitors experience a decline.

Many visitors who feel the 50 minute visit of this museum is felt less and there is a sense of disappointment cannot document the museum collection. However, with this feeling of inadequacy, visitors will be relentless and curious to return to the museum to learn again about Javanese culture in this museum. Collections of museums cannot be documented and create a mystery to other prospective visitors. Because of that special, not easy to get and must be attempted. To overcome the lack of information about the culture of Java, the museum will arrange pocket books that can be obtained at the museum souvenir shop.

IV. CONCLUSION

The concept of a museum that prioritizes visitors as a primary resource to make the management of the museum makes the rules made for the museum's convenience. Javanese philosophy of '*sitik eding*' that this life share makes management not too focused on excessive visitors show in order to increase the number of museum visits, because too many visitors and not organized well then the comfort will be disrupted. The concept of '*sitik eding*' is what makes the museum not too ngoyo publish, because they feel quite with the current conditions are more than enough. In other terms not greedy (*ora kemlaruk*=java) in taking all visitors to the museum. With the restrictions on the number of visitors also, they hope other museums will also get visitors, and not focused on one museum Ullen Sentalu only.

The lack of man power of museum organizers to make the level of documentation of museum activities to be hampered. Management information systems in the form of websites are rarely updated and more conservative impression because the results of the board decision of the foundation who want the website is not too crowded and impressed complicated. Activeness update data moved account social media more current like twitter, instagram and facebook with target young user. It needs an update from the official website of the museum which is the official address of the information system, so that the general public who need can know the development and activities of this museum.

ACKNOWLEDGMENT

This research is fully supported by Education Fund management institution (LPDP) Ministry of Finance Republic of Indonesia to the work of students for the improvement activity of writing scientific articles and international publications.

REFERENCES

- [1] Haryono, Daniel. Museum Ullen Sentalu; penerapan Museuologi Baru. Presented seminar towards Indonesian Postmodern Museums, Departemen Arkeologi Universitas Indonesia. 2011.
- [2] Candrajanti, Puspa.2007. Penerapan Elemen Interior Dalam Ruang Pamer Museum Ullen Sentalu Kaliurang Yogyakarta, (Skripsi) Institut Seni Indonesia
- [3] Gordon, 2002. Kerangka dasar sistem informasi manajemen, penerbit PPM, Seri Pengembangan Manajemen no-90-A
- [4] Baroroh, Aulia Zaki. 2010. Melihat Jawa Dari Sebuah Jendela, Museum Ullen Sentalu Dalam Praktik Konsumsi Ideology Pengunjung,(Tesis) Universitas Gadjah Mada, Yogyakarta

Local Tourism Promotion through Multilingual Vlog in Garut, Indonesia

¹Pandu Purwadi, ²Aini Novianty, ³Deden Ardi Nugraha, ⁴Yuanda Lestari

^{1,4}Faculty of Humanities, Padjadjaran University, Sumedang, Indonesia

²Faculty of Science, Padjadjaran University, Sumedang, Indonesia

³Faculty of Social Science, Padjadjaran University, Sumedang, Indonesia

E-mail: ¹pandupurwadi18@gmail.com, ²rd.aininovianty@gmail.com, ³ardi.deden@gmail.com, ⁴lestariyuanda@gmail.com

ABSTRACT

Nowadays, vlog or video blog is an informative media with various contents for people of all ages. There are videos with themes of daily activities, games, sport, and tourism. The existence of vlog with tourism themes make it possible to be one of the ways to promote local culture of a place. In addition, internet based support as channel for global publication also good for local wisdom promotion from everywhere to anywhere. This research is about an experiment on vlog project in Garut, West Java, Indonesia. The vlog explains about tourist places in Garut through different languages: English, German, and Mandarin. Qualitative descriptive is used in this research. The goals of this research are for giving experiment result from vlog project and information about tourism promotion in Garut, Indonesia, and Asia to all elements such as experts, academic staffs, students, government, and society in the world. Publication and video promotion production are the results of the research.

Keywords: culture, globalization, technology, tourism

I. INTRODUCTION

A. Statement of Problem

Indonesia is one of the countries in Southeast Asia that has natural resource and tourism prospect in the future. This country is known as an archipelago state because it has some islands with different soil structures. According to Statistics Indonesia (*BPS/Badan Pusat Statistik Indonesia*) in 2015, this country has 17.504 islands from Sabang to Merauke and Miangas to Rote Island. That condition makes many beautiful places worth a visit in Indonesia; meanwhile, only several famous regions have known visited by international and local people. Those regions have unique culture to attract people to visit. The other regions actually have their identity too, but they find many obstacles in order to be known, especially related to publication issues. Garut is a town in the West Java province of Indonesia. There are five mountains around this town and beaches in the southern area. Garut has some suitable places that can be visited during vacation, for instance hot water spring, forest, and tea plantation. Although not famous like other places, such as the island of Bali and Lombok or as the city of Bandung and Yogyakarta, however this town has unique foods, souvenirs, and culture too. That distinctiveness is a big potential that can be used by the society and government to increase visitors and Indonesia tourism growth.

B. Objectives

- 1) To implement and publish multilingual vlog in media social

- 2) To identify and analyze the usefulness of multilingual vlog in the international and local people

C. Significance of the Study

This research is expected to be a publication material and media that have important role to take control in increasing visitor in Garut, Indonesia, because globalization now makes information accessed by people around the world through technology.

II. LITERATURE REVIEWS

A. Local Wisdom

Nakorntap et al. In Mungmachon (2012) explains, that local wisdom is basic knowledge gained from living in balance with nature [1]. In real experiences related with the body, the spirit, and environment. It emphasizes respect for elders and their life. Values of morals more than material things. Also, Kartika (2014) defines local wisdom is an action by people got passed down from their parents [2]. An action is positive for local community to get harmony.

Local wisdom come from local community, in deep from family or parents. There are knowledge, morals, values, and positive action to balance the local situation.

B. Globalization

Globalization is the process of economic, social, cultural, and political activities that cross national boundaries [3]. As a phenomenon, Globalization has been seen through many aspects: economic, culture, politics, social and technology. In case of culture and

financial markets, Mazarr (2005) defines globalization as faster sales, improved telecommunications, and increased global availability of media provided by new ICT [4].

Globalization makes information technology growth faster these days. In the context of tourism, globalization has clear impact on tourism. Moreover, technology is also facilitating by giving easiness to find information globally, review about places all over the world, and to promote using interactive online media easily.

C. Digital Media

Digital media is defined as products and services that come from the media, entertainment and information industry and its subsectors. It includes digital platforms (e.g. websites and applications), digitized content (e.g. text, audio, video and images) and services (e.g. information, entertainment and communication) that can be accessed and consumed through different digital devices [5].

The use of digital media as an information resource and communication platform has grown, especially for tourists, such as through online information that can be accessed from websites, email, blogs, and social networking sites. Electronic gadget industries also have united with telecommunications providers to facilitating information, travel plans, itineraries, reservations, and sharing their travel experiences. Heung (2003) acknowledged that travellers are increasingly utilizing digital sources such as tourism websites in their information search and communication exchange [6]. Digital users in tourism can get an immediate of where they want to go by viewing videos that other tourists have uploaded through social media such as YouTube. Photo and video are the most attractive media to share experiences and tend to encourage people to visit some places. This is also one of benefit of digital media in tourism industry, because digital media have contributed to promoting tourism, not only official promote but also by review by other tourists such as self-made travel video blog (vlog).

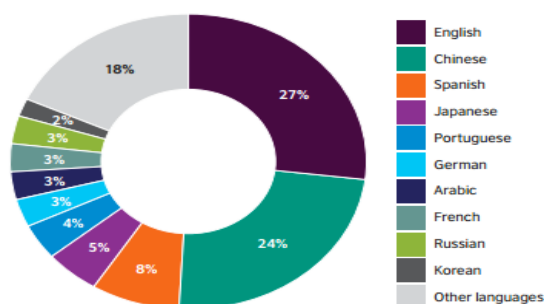


Figure 1. Internet use by language

Chart from Internet World Stats in British Council 2013 reporting about *Languages for the Future* above shows that English is the most dominant language used on the internet, the second is Chinese, while Spanish and Japanese are close to third rank, meanwhile German and other languages are below of them. That research can be used as a standard that it is still better to use English for promoting tourism to other people across the world.

D. Tourism

In choosing a place to be their destination, tourists do need some recommendation about tourism. Tourism is an activity that is delivered at the local destination, hopefully by local residents and drawing upon local culture, cuisine and attractions, yet it is impacted upon by global processes, creating the dilemma of global or local nexus [7]. On the other hand, destinations are traditionally defined as territories, geographical areas, such as a country, an island or town [8].

E. Communication

Communication holds important role in promoting. Communication can be defined as the process of transmitting information and common understanding from one person to another [9]. The general purpose is to use communications to persuade people to buy products or services, while in the case of tourism, the use of communications is to persuade people to visit some destinations.

In persuading people to come to a place, we can use marketing communications as the solution. An organisation engages with its various audiences through a management process. By understanding an audience's communications environment, organisations seek to develop and present messages for their identified stakeholder groups, before evaluating and acting upon the responses. By conveying messages that are of significant value, they encourage audiences to offer attitudinal and behavioural responses [10].

Currently, the revolutionized meaning of information communication technologies and Internet technologies refers to mobile communications that enable individuals to move and generate, transmit and receive different kinds of information. Because of this process, various models of communication emerged. With the help of information communication technology in the global environment, individuals may interact; move through space and time and their necessary information accompany and help them to find the desirable product or services.

In tourism, companies try to combine varied marketing techniques they used in the past and they

analyze several specific factors in the process of developing communication mix strategy (type of tourism market, traveller's readiness to make purchase, destination development stage, and the brand's market share and positioning). Sophisticated target groups and modern ICT environment are a serious challenge for tourism industry and it is of great importance to send the right messages through the proper media channels.

F. Intercultural Communication and Language

Intercultural communication can be define as the sharing information on different levels of awareness and control between people with different cultural backgrounds, where different cultural backgrounds include both national cultural differences and differences which are connected with participation in the different activities that exist within a national unit. Gudykunst (2002) explains that there are two keys concept from intercultural communication: communication and culture between individuals of different culture [11].

Language and culture are close to each other, thus students learn culture by take or use language from its region. Whorf in Littlejohn and Foss (2009) define that communication with language makes humans human [12]. Language is not only as a media, but also as an important instrument. Language is primary and unique in human for communicating like share ideas, express intentions, and get information [13].

III. METHODOLOGY

This research is based on studying literature, concept and theories about tourism, communication, and culture. The used method is qualitative descriptive.

IV. FINDING AND DISCUSSION

A. Concept and Contents

In the beginning, this multilingual vlog needs concept to realize its utility and usefulness for local and international viewers. This model will maintain the main purpose to publish value of local wisdom around the world through internet.

Place for publishing local contents fits in social media like YouTube, Facebook, Instagram, and website. Those have million users in that platform. Everyday there are active users anywhere and anytime surfing internet on them. For now, the multilingual vlog of this research starts available on YouTube and Instagram, not ready launch first in a website.

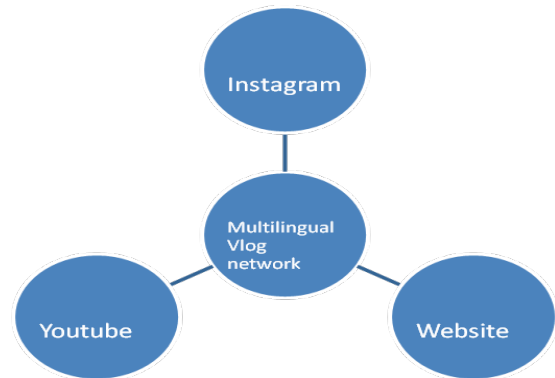
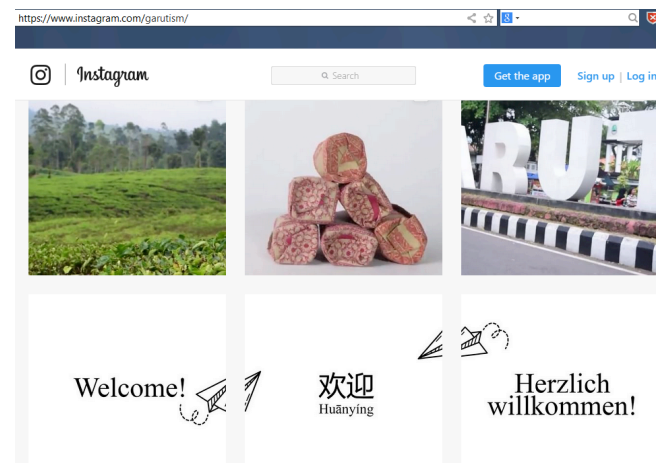


Figure 2. Multilingual Vlog Network in Internet Platform

As popular social media, Instagram has many functions like to post a photo and video gallery, also story and live features. It can approach followers to keep and touch with multilingual vlog's contents. Showed in the picture below, there are three one minute-videos introducing viewers with nature tourism, special food called Dodol, and landmark in the street and three more photos of greeting in three languages, English, Mandarin, and German.



Second social media discussed in this research is YouTube that fits for video publication. Multilingual vlog makes channel to publish full video about Garut here. Different with Instagram, viewers can watch video more than one minute in YouTube. Viewers can comment, like, and subscribe this channel for newest update video. The contents in this multilingual vlog are about culture in Garut, Indonesia, based on the local wisdom.

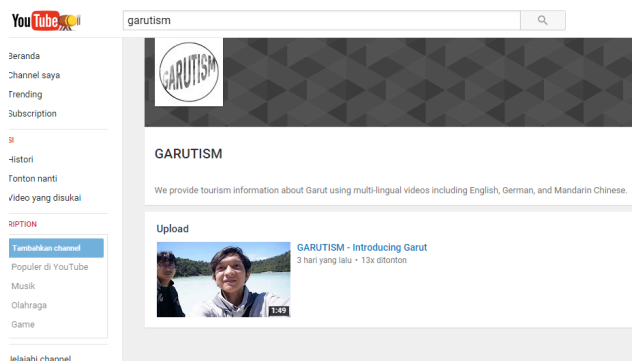


Figure 4. Garutism on YouTube

B. Usefulness of Multilingual Vlog

Languages for this multilingual vlog are English, Mandarin, and German. Those languages used by most of people around the world. Then, there is intercultural situation. Language is one aspect of culture. This media use multiple languages for the reason is to get respect from people by respect them first. Then, Garutism presents "think globally and act locally" behaviour. It maintains local wisdom and networking with international relations. The output goals (for international people) is to make this media impact to local culture value, spread out information about characteristic of Garut, like foods, natural tourism, dance, fashion, and its identity into the world, while the input goals (for local people) is to let them know and learn foreign languages, pride about their own identity and culture.

V. RESULT OF THE STUDY

In this globalization situation, Indonesia as a country with natural and culture potentials should utilize technology to achieve goals. One of them is spreading out local wisdom in each region to global platform.

Multilingual vlog is one of the solutions to be able to think globally and act locally. The concept and contents have important role. It uses three languages to inform local culture into the world. The impact are local people pride with their own culture and international people know about Indonesia deeper. Introduction tourism profile with photos and videos in social media. Its include culture, foods, fashion, dance, and local wisdom. Information is available in internet like YouTube, Instagram and website. People can keep in touch with it.

There is usefulness for local and international side. Local people can study and learn basic foreign language, but also pride with the identity and give respect impact to international people to visit tourism region.

International viewers know culture of local through multilingual vlog.

VI. RECOMMENDATIONS FROM THE STUDY

Recommendation from result of the study is that multilingual vlog does not only give local culture contents for international visitors, but also give basic foreign languages education for local society. Multilingual vlog can help people to, as Paul McCartney said, think globally and act locally. With that behaviour, hopefully, in the future Indonesia can mingle in the international sphere and still maintain its culture at the same time.

VII. SUGGESTIONS FOR FUTURE RESEARCH

The study of this multilingual vlog use qualitative method, therefore, it is better if the future research uses should in quantitative method, for example to give specific number about amount of vlog viewers each month, and to share questionnaire for the viewers. That kind of research can give comprehensive results to know the improvement of vlog and make some evaluations to develop vlog contents.

REFERENCES

- [1] Mungmachon, R. (2012). "Knowledge and Local Wisdom Community Treasure" International Journal of Humanities and Social Science Vol. 2, 3, pp. 176
- [2] Kartika, T. (2014). "Nonverbal Communication Study Human Behavior Reflection As Local Wisdom" IOSR Journal of Humanities And Social Science Vol. 19, 11, pp. 29
- [3] Robertson, R. (1992). Globalization. London: Sage.
- [4] Mazarr, M. J. (2005). Global Trends. New York: Palgrave.
- [5] World Economic Forum. (2016). Council.
- [6] Heung, V. S. (2003). Internet Usage by International Travelers: Reasons and Barriers. International Journal of Contemporary Hospitality Management, 15, pp. 370-378.
- [7] Cooper, C. (2008). Globalization Is More than an Economic Phenomenon (Vol. 33).
- [8] Davidson, R., & Maitland, R. (2000). Tourism Destinations. London: Hodder & Stoughton.
- [9] Keyton, J. (2010). Case studies for organizational communication: Understanding communication processes. New York: Oxford University Press.

- [10] Fill, C., & Jamieson, B. (2006). *Marketing Communications*. Edinburgh.
- [11] Gudykunst, W. B., & Mody, B. (2002). *Handbook of international and intercultural communication*. Sage Publications California. Retrieved from https://books.google.co.id/books/about/Handbook_of_International_and_Intercultu.html?id=0FYtvfvpphIC&redir_esc=y
- [12] Littlejohn, Stephen W. & Foss, Karen A. (2009). *Encyclopedia of Communication Theory Volume 1*. Sage Publications. California. Retrieved from https://books.google.co.id/books/about/Encyclopedia_of_Communication_Theory.html?id=7jFaAAAAYAAJ&redir_esc=y
- [13] Powers, D. E. (2013). *Assessing English-language proficiency in all four language domains: Is it really necessary?*. Compendium Study, ETS, TOEIC. Retrieved from <https://www.ets.org/Media/Research/pdf/TC2-01.pdf>

Memory Strategy Options in Collocation Learning among EFL Learners

กลวิธีการจดจำคำศัพท์สำหรับการเรียนคำปรากฏร่วมของผู้เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ

¹Pansupa Panchoojit, ²Sukhum Wasuntarasophit

Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen, Thailand

E-mail: ¹panspa.p@gmail.com, ²sukwas@kku.ac.th

ABSTRACT

In addition to being taught terms, the learners or students should have strategies to increase their vocabulary knowledge (Oxford, 2003). Memory strategies are one of the most effective methods to help the learners with vocabulary learning (Nemati, 2009). With respect to learning vocabulary, it doesn't consist of simply learning a new single word and its meaning, but learners should learn how the words collocate and their collocations (Lewis, 2000). Collocations can improve the learners' communicative skills. Moreover, when the learners use them, it sounds natural to native speakers (McCarthy, 2005). Thus, the present study has attempted to investigate the use of memory strategies for collocation learning among 41 EFL students from Khon Kaen university. In the study only 3 sub-memory strategies were selected to be utilized which included imagery, making acronyms, and grouping. Collocation exercises were taught to the participants and a questionnaire was administered to collect data. In the training sessions, the participants learned to apply the selected memory strategies to the collocation exercises. After the training sessions had been completed, questionnaires were given to the participants. These instruments allowed the participants to indicate which of the 3 selected sub-memory strategies they had most often selected to use with their collocation learning. Content analysis was used to analyze the data from the questionnaires. The results indicated that the type of collocation exercise which had been used for collocation learning was "grouping".

Keywords- *Collocation knowledge; Teaching of collocations; Memory strategies; Imagery; Acronyms; Grouping*

I. INTRODUCTION

In language teaching and learning, grammar isn't the only focus. Vocabulary is another very essential part. This notion is supported by a statement by Wilkin (1972, pp. 111-112) who stated that "without grammar little can be conveyed; without vocabulary nothing can be conveyed". However, vocabulary is neglected in the language classroom because there are many teachers who believe that vocabulary can be acquired while the learners are learning other skills such as reading and writing, etc. (Zimmerman, 1997).

Regarding teaching vocabulary, it doesn't simply consist of teaching a new single word and its meaning. Instead of explaining what each of word means, teachers should show the learners the functions of the words and how they collocate (Lewis, 2000). Words don't only appear as single units, but they also appear in two or more groups of items which are known as word combinations or collocations (Duan & Qin, 2012; Harmer, 2001). Collocations are defined as a combination of words which are used together. Furthermore, collocations can help the learners to sound more like native speakers when they use them (McCarthy, 2005). Hill (2000, p. 53) argued that about 70% of everything we say, hear, read, or write consists of collocations. In addition, there are many researchers who have supported the importance of collocations (e.g. Boonyasquan, 2011; Duan & Qin, 2012; McCarty, 2005). However, because teaching and learning collocations has been neglected in the language

classroom, there is a lack of collocation usage among the students (Hashemi, Aziznezhad & Dravishi, 2012). Even if students are advanced EFL learners, they will still have problems with collocations, and the same is true for Thai learners (Mongkolchai, 2000; Supanfai, 2009). The task of finding ways to help the learners expand their knowledge of vocabulary or collocations should not be ignored. Vocabulary teaching isn't solely about teaching terms. Therefore, learners should be given strategies which can help them to improve their vocabulary knowledge (Oxford, 2003). In addition, memory strategies are one of the most effective methods for helping learners, and many researchers have supported the use of memory strategy instruction (Gorbani & Riabi, 2011; Zahedi & Abdi, 2012; Nemati, 2009).

To conclude, there are many studies that have supported the idea that memory strategies represent beneficial methods to help the learners in vocabulary learning. In previous studies, only single words were selected to be used in memory strategies. However, as a part of vocabulary learning, the learners should learn the word's collocations. Given that learning collocations is one of the important aspect of vocabulary learning, it still remains a difficult part for all EFL learners, even the advanced EFL learners. Thus, the present study has been carried out in order to investigate the memory strategies that the students had most frequently selected to use in their collocation learning.

In order to find the most suitable strategies for collocation learning for university EFL learners, the

following research question was formulated: *“Of the 3 sub-memory strategies, which strategies did the students employ in their collocation learning?”*

II. LITERATURE REVIEW

A. Collocational Knowledge

Understanding the various parts of vocabulary knowledge is required because it indicates the learners' level of comprehension (Chou, 2011; Shahov, 2012). To become successful in communication, EFL learners should increase their vocabulary knowledge. Vocabulary knowledge is only a part of knowing a word. It doesn't mean that the learners have to simply learn its meaning or its definition, but it involves knowing its word family or collocations (Nation, 2001). Words are always used together and are also presented in their collocational forms. While, there are many ways to raise the level of vocabulary knowledge, knowing a word's various collocations is one of the essential parts of knowing a word. Therefore, knowing a word means that the learners are required to know its collocations in order to understand the word and to increase their vocabulary knowledge (Duan & Qin, 2012).

In term of “Collocations”, collocations have been examined by many scholars (e.g., Firth, 1957; Lewis, 2000; Nesselhauf, 2005). Firth (1957) was the first to introduce collocations by defining them as a combination of words which normally co-occur or appear together. While, Woolard (2000) defined collocations as “words which are statistically much more likely to appear together than random chance suggests” (p. 24). Moreover, Sinclair (1991) defined collocations as “items that occur physically together or have strong chances of being mentioned together”. The definitions provided by Woolard and Sinclair are slightly different. The earlier definitions showed that in order to define collocations, co-occurrence and a frequency-based approach needed to be used. In addition, it is indicated that collocations can be viewed differently both in their frequency of occurrences and in their combinations.

In language learning, collocations are important and are beneficial to the learners with respect to all language skills: reading, writing, listening, and speaking. Moreover, using collocations can help learners to sound more like native speakers (Fan, 2009). Hill (2000) argued that about 70% of everything we say, hear, write, and read consists of collocations. Similarly, Goudarzi (2012) stated that collocations affect the language ability of learners. In regard to the accuracy and fluency of the learners, collocations represent an important part of language learning. There are a number of scholars who have recommended that collocations should be included in language teaching and learning (e.g., Attar & Allami,

2013; Goudarzi, 2012; Bazzaz & Samad, 2011). Thus, it has been demonstrated that collocational knowledge is required and should be taught to EFL learners to benefit them in utilizing their language skills and communicating successfully. Moreover, to better perform in all language skills, the learners should pay more attention to collocations. Even though collocations are essential, they are still problematic for EFL learners, even the advanced EFL learners. There are number of previous studies which have indicated that EFL learners are still facing collocations' problem (e.g., Phoocharoensil, 2013). For example, Thai students may say that they “play the Internet” instead of saying that they “surf the Internet” (Supanfai, 2009). Therefore, collocation learning should be included in EFL language classroom.

B. The Teaching of Collocations

Collocations are quite new to EFL learners and even to some EFL teachers. The learners still have problems with collocations when they use them. As a result, if teachers seek to help the learners increase their collocational knowledge, teaching collocations is required. With respect to teaching collocations, there are many concepts related to teaching them (Hill, 2000; Radhi, 2013; Wu, 2010). For instance, Hill (2000) recommended that collocations should be taught as a single word. Yet, Wu (2010) stated that when the teachers are presenting a new word, its collocations should also be presented with that word. Moreover, it has also been recommended to focus on “mis-collocations” (Conzett, 2000; Radhi, 2013; Woolard, 2000). In addition, it has further been suggested to focus on “verb + noun” collocations because these are the first mistakes that EFL learners make (Lewis, 2000; Yan, 2010). Studies have shown that this type of collocation is difficult for some ESL and EFL learners to acquire and is frequently misused by the learners (Liu, 2002; Wang, 2001). Additionally, the four most misused verbs from “verb + noun” collocation have been shown to be “make”, “do”, “take”, and “have” which have been recommended for EFL learners because these verbs can help them to become more focused on mis-collocations (Yan, 2010).

With respect to teaching collocations, there are many different methods of teaching collocations, yet they still remain difficult for EFL learners. Nemat (2009) suggested that in order to assist learners with vocabulary learning, language learning strategies are recommended. Moreover, Wu (2010) also mentioned teaching the learners strategies to help them with vocabulary learning. Therefore, if teachers wish to help the learners increase their vocabulary knowledge, strategies should be presented. Nation (1990) stated that “Language learning strategies” are related to ways of helping students learn

more easily and more quickly, as well as helping to make learning more enjoyable. Whereas, many types of language learning strategies exist, one of the most effective ways to assist the learners is by utilizing “Memory strategies” and this strategy has been supported by many scholars (e.g. Sozler, 2012; Yek, 2006).

C. Memory Strategies

Memory strategies or “mnemonics” are one of the most effective strategies for vocabulary learning (Sozler, 2012). Oxford (1990) claimed that memory strategies can help the learners to store and to retrieve new items of vocabulary. Memory strategies are divided into 4 sets as follows: 1) creating mental linkages, 2) applying images and sounds, 3) reviewing well, and 4) employing action. Of the 4 sets of memory strategies which have been classified by Oxford (1990), only 3 sub-memory strategies were selected for the present study: imagery, making acronyms, and grouping.

1) “**Imagery**” refers to linking a list of things to concepts in memory by picturing them together or separately. The image can be anything, such as a picture of an object or a picture of a place, etc.

2) “**Making Acronyms**” refers to using acronyms and means that the learners will form real or nonsensical words from the first letter of a list of words.

3) “**Grouping**” indicates that learners place words together that belong to the same category and in so doing can make the words easier to remember. Groupings can be based on types of words, topics, or similarities, etc.

In conclusion, there are many research studies that have supported the use of memory strategies (Ghorbani & Riabi, 2011; Marzban & Amoli, 2012; Nemati, 2009; Sozler, 2012; Zahedi & Abdi, 2012). These 3 sub-strategies of imagery, making acronyms, and grouping have been suggested to be one of the most useful methods of helping learners retain vocabulary. In addition, Sozler (2012) argued that memory strategies can help the learners to remember and retrieve the new information. However, only rarely have studies incorporated memory strategies into collocation learning. Therefore, in the present study, memory strategies were selected to assist in revealing the students’ frequency of use in learning collocations. Four sets of memory strategies have been classified by Oxford (1990). Due to their ease of implementation, of the four, three sub-strategies of ‘imagery’, ‘making acronyms’, and ‘grouping’ were selected for the present study. Therefore, the target for teaching should be to increase retention without increasing study time. Since learners forget much of what they have learned, applying memory strategies is a good way for the learners to derive benefits from

learning that provides them with long-lasting knowledge (Nemati, 2009).

III. METHODS

This research study was conducted on 41 EFL learners in order to determine which of the selected sub-memory strategies the participants would most often choose to use in their collocation learning. This portion discusses the research procedures (including the participants), as well as the research instruments.

A. Participants

The participants of the present study were 41 Khon Kaen University students from various disciplines and were selected by a purposive sampling technique as a representative of the whole for the following reasons. Firstly, it has been argued that collocation is difficult for EFL learners, even for advanced EFL learners (Attar & Allami, 2003). Secondly, if the learners were equipped with language learning strategies, it could help them to improve vocabulary knowledge. Thirdly, the use of memory strategies has been recommended and supported by many scholars (Asgari & Mustapha, 2011; Oxford, 2003; Nemati, 2009). Therefore, these students were selected to participate in the present study.

B. The Research Instruments

1) The Questionnaire

The questionnaire was adapted from a study by Nemati (2009) and was divided into two main parts as follows: 1) general information and 2) the learners’ frequency of usage of the memory strategies. In order to increase understandability and to avoid misunderstandings, the questionnaire was created using the Thai language. The questionnaire consisted of a series of statements that focused on the participants’ collocation learning processes for which they were required to rate the level of frequency with which they had utilized the memory strategies. The interpretation of the participants’ responses was based on a scale from 1 to 5 as follows: 1 = “never”, 2 = “rarely”, 3 = “sometimes”, 4 = “almost every time”, and 5 = “every time”.

2) Collocation Exercises

The exercises were adapted from a book entitled, “English Collocations in Use” by Michael McCarthy and Felicity O’Dell (2005) and was edited by a native English speaking teacher. They consisted of matching exercises, and the purpose

of the activities was to raise the learners' awareness of collocation learning by utilizing memory strategies. Hill (2000) suggested that various types of collocation exercises can help the learners to have more awareness of collocations.

In addition, the collocation exercises were conducted to train the learners on how to apply memory strategies to their collocation learning. Given that there are various types of collocations, for these exercises only "verb + noun" collocations were selected because these have been found to be a major area of weakness for EFL students (Liu, 1996 b; Liu, 2002, as cited in Bhumadhana, 2011) Moreover, focusing on mis-collocations has been suggested by many researchers (e.g., Conzett, 2000; Radhi, 2012; Woolard, 2000). Yan (2010) claimed that collocations comprised of "make", "do", "take", and "have" plus nouns are the most misused of the verb + noun collocations. Thus, these 4 misused types were selected for the study. Furthermore, the target items, that were connected to the 4 misused types, were selected from the GSL (General Service List, West, 1953) and were also selected from the following books: 1) "English Collocations in Use" by Michael McCarthy and Felicity O'Dell (2005) and 2) the participants' textbook, "Touchstone" by Michael McCarthy, Jeanne McCarren, and Helen Sandiford (2014). Finally, 30 target words were selected to make 30 targeted collocations which were then randomly mixed into 4 set of collocations.

C. Data Collection

The researcher began the first step of the three-step process by explaining the nature of collocations and memory strategies. Next, the exercises were provided to the participants, and finally, they were trained in how to apply the 3 selected sub-memory strategies with their collocation learning. The researcher offered help and some suggestions to the participants while they were doing the exercises. The format of the exercises was matching. The participants were required to match each collocation with the correct sentences, and each word could only be used once. Furthermore, each of the participants, on his/her own, could choose to use any of 3 selected sub-memory strategies while doing the exercises.

The training sessions, which took place twice a week, were conducted from the first week of the semester through the third week for a total of 5 sessions. Each session took about 90 minutes, but the training only took approximately 30 minutes. During the training session,

the researcher trained the participants in each of the sub-memory strategies and provided suggestions on how to apply memory strategies to their collocation learning. In the third week, the participants were required to complete the questionnaire. The entire process to collect the data took about three weeks.

Table 1: THE LESSON PLAN

| Week | Class | Step | Activity |
|------|-------|--|---|
| 1 | 1 | Introducing Collocations | <ul style="list-style-type: none"> Teacher introduced "collocations" and gave the students some examples. |
| | | Presenting Memory Strategies | <ul style="list-style-type: none"> The students received an explanation of memory strategies and the teacher grabbed the students' attention by familiarizing them about memory strategies. Teacher offered students an explanation of how to apply memory strategies with their collocation learning. Teacher explained what the students needed to do and allowed them practice an activity. |
| 1 | 2 | Practicing Collocation Learning Using the Acronym Technique | <ul style="list-style-type: none"> Teacher introduced the concept of collocation learning through use of the acronym technique. Teacher trained the students on how to use the technique and allowed them do the activities. |
| 2 | 3 | Practicing Collocation Learning Using the Imagery Technique | <ul style="list-style-type: none"> Teacher introduced the concept of collocation learning through the use of the imagery technique. Teacher trained the students on how to use the technique and allowed them do the activities. |
| 2 | 4 | Practicing Collocation Learning Using the Grouping Technique | <ul style="list-style-type: none"> Teacher introduced the concept of collocation learning through the use of the grouping technique. Teacher trained the students on how to use the technique and allowed them do the activities. |
| 3 | 5 | Summarizing | <ul style="list-style-type: none"> Teacher summarized the concept of collocation learning through the use of the memory strategies. |
| | | The Questionnaire | <ul style="list-style-type: none"> Teacher provided the questionnaire to the students so that they could examine the frequency with which they had used memory strategies in their collocation learning. |

IV. RESULTS

The Frequency of the Usage of Memory Strategies on Collocation Learning

TABLE 2: THE STUDENTS' FREQUENCY OF MEMORY STRATEGY USAGE IN COLLOCATION LEARNING

| Topics | Level of Frequency of Use | | Interpretations |
|--|---------------------------|-------------|--------------------------|
| | X | S.D. | |
| 1. Using images helps me to better remember the collocations. | 3.68 | 0.85 | Almost every time |
| 2. Grouping the collocations is a beneficial way to learn new collocations. | 3.95 | 0.70 | Almost every time |
| 3. Remembering the first letter of each collocation can help me to remember the collocation faster. | 3.54 | 0.77 | Almost every time |
| 4. When I learn a new collocation, I will make a collocation image card. | 2.95 | 1.10 | Sometimes |
| 5. When I learn a new collocation, I imagine its image to help me remember it. | 3.37 | 0.96 | Sometimes |
| 6. I group the collocations by their parts of speech. For example, "noun", "verb", etc. | 3.34 | 1.03 | Sometimes |
| 7. To remember the collocations, I group the collocations into categories, such as animals, vegetables, or subjects. | 3.78 | 0.93 | Almost every time |
| 8. I use its acronym to help me remember the collocations. | 3.32 | 0.96 | Sometimes |
| 9. To remember the collocation, I remember only the first letter of the word for each collocation. | 3.51 | 0.92 | Almost every time |
| 10. To remember the collocation, I use its acronym to make a new word. | 2.95 | 1.13 | Sometimes |
| Average | 3.43 | 0.93 | Almost every time |

Table 1 indicates the students' frequency of usage of the memory strategies for collocation learning for each of the statements. The three top responses with the highest average mean scores were *Topics 2, 7, and 1*. In *Topic 2* which received the highest mean score ($\bar{x} = 3.95$, S.D. = 0.70), it was revealed that almost every time when the students had learned new collocations, the technique of grouping the collocations had been useful to them. *Topic 7* received the second highest average mean score ($\bar{x} = 3.78$, S.D. = 0.93), which indicated that when the students had wanted to remember collocations, they had grouped them almost every time into the categories such as subjects and animals, etc. *Topic 1* received the third highest average mean score ($\bar{x} = 3.68$, S.D. = 0.85) which indicated that when the students had wanted to

remember collocations, they had used images almost every time.

In this study, three sub-memory strategies were selected in order to investigate the students' frequency of usage for each of the sub-memory strategies with respect to collocation learning. Their frequency of memory strategy usage has been divided into the following 3 types as shown in Table 3.

TABLE 3: THE STUDENTS' FREQUENCY OF SEPARATING THE USAGE OF SUB-MEMORY STRATEGIES IN COLLOCATION LEARNING

| Topics | Types of MS | Level of frequency use | | Interpretations |
|--|-------------|------------------------|-------------|--------------------------|
| | | X | S.D. | |
| 2. Grouping the collocations was a beneficial way to learn new collocations. | Grouping | 3.95 | 0.70 | Almost every time |
| 6. I grouped the collocations by their parts of speech. For example, "noun", "verb", etc. | Grouping | 3.34 | 1.03 | Sometimes |
| 7. To remember the collocations, I grouped the collocations into categories, such as animals, vegetables, or subjects. | Grouping | 3.78 | 0.93 | Almost every time |
| Average | | 3.69 | 0.88 | Almost every time |
| 1. Using images to helped me to better remember the collocations. | Imagery | 3.68 | 0.85 | Almost every time |
| 4. When I learned a new collocation, I would make a collocation image card. | Imagery | 2.95 | 1.10 | Sometimes |
| 5. When I learned a new collocation, I would imagine its image to help me remember it. | Imagery | 3.37 | 0.96 | Sometimes |
| Average | | 3.33 | 0.97 | Sometimes |
| 3. Remembering the first letter of each collocation helped me to remember the collocation faster. | Acronyms | 3.54 | 0.77 | Almost every time |
| 8. I used its acronym to help me remember the collocations. | Acronyms | 3.32 | 0.96 | Sometimes |
| 9. To remember the collocation, I remembered only the first letter of the word for each collocation. | Acronyms | 3.51 | 0.92 | Almost every time |
| 10. To remember the collocation, I used its acronym to make a new word. | Acronyms | 2.95 | 1.13 | Sometimes |
| Average | | 3.33 | 0.94 | Sometimes |

Table 3 shows the students' frequency of usage for each of sub-memory strategies (i.e., imagery, making acronyms and grouping) during collocation learning. The results indicated that the "Grouping" strategy had had the highest mean score. The students' frequency of "Grouping" had been shown to have the highest mean score ($\bar{x} = 3.69$, S.D. = 0.88). This indicated that the students had grouped sets of collocations almost every time. "Imagery" and "Making Acronyms" shared the second highest mean score with ($\bar{x} = 3.33$, S.D. = 0.97) and ($\bar{x} = 3.33$, S.D. = 0.94), respectively. This result indicated that the students had sometimes used these two strategies. Using "Imagery" meant that the students had sometimes remembered collocations by using images. Using "Making Acronyms" meant that the students had sometimes remembered collocations by recalling only the first letter of each word in the collocations.

In order to compare the 3 sub-memory strategies, the mean scores were analyzed by using One-way Anova to reveal the significance differences between the 3-sub-strategies. The results are shown in Table 4 below:

TABLE 4: THE VALUES OF STATISTICAL DIFFERENCE FOR EACH OF THE SUB-MEMORY STRATEGIES

| Type of MS | Level of Frequency of Usage | | | Sig. |
|-----------------|-----------------------------|------|------|------|
| | No. of Students | Mean | S.D. | |
| Grouping | 41 | 3.69 | 0.88 | 0.88 |
| Imagery | 41 | 3.33 | 0.97 | |
| Making Acronyms | 41 | 3.33 | 0.94 | |

$\alpha > 0.05$

This study investigated the students' frequency of usage of the memory strategies for collocation learning. Table 4 shows a comparison of the 3 sub-memory strategies which were analyzed using One-way Anova. The mean scores of "Grouping", "Imagery" and "Making Acronyms" were 3.69, 3.33, and 3.33, respectively. The findings indicated that when the 3 sub-memory strategies were compared, there had been no significant difference (Anova = 0.88, $p > 0.05$). The results indicated that the students had employed all three of the sub-memory strategies in their collocation learning.

V. DISCUSSION AND CONCLUSION

The findings from the present study found that the students had been satisfied with collocation learning through memory strategies. They felt that it had been able to help them have better retention and it had been an easy

method for them to use in learning collocations. The data from the questionnaire also revealed that among the 3 selected sub-memory strategies, the learners had most often employed the "Grouping" strategy in their collocation learning.

The Frequency of Usage of Memory Strategies in Collocation Learning among Students

In this article, the research question formulated for the study was intended to explore which of the strategies had been employed by the students in their collocation learning. The results revealed that the students had perceived the 3 sub-memory strategies as having value. Moreover, of the 3 sub-memory strategies, the students agreed that they had most frequently used "Grouping" during their collocation learning, while "Imagery" and "Making Acronyms" had been their second choices as noted by both of them sharing the second highest mean score. In fact, they had employed all of the three strategies almost every time. In addition, the results from the questionnaires indicated that the students had deemed all 3 sub-memory strategies to be acceptable, useful, and helpful in their collocation learning process.

In order to better help EFL learners in the area of vocabulary learning, memory strategies need to be highlighted. Because learning collocations is difficult for EFL learners, students should be trained in the techniques of applying memory strategies to their collocation learning because they are useful in the arenas of language teaching and language learning. Moreover, memory strategies provide the students with the necessary help to acquire and retain new words. In the training session, it was suggested that the students should apply the 3 sub-memory strategies in their collocation learning. Afterwards, they came to the realization that memory strategies are beneficial way to learn collocations.

What the present study illustrates is that when memory strategies are provided to the students when they are engaged in learning collocations, the students will become more motivated to learn the language by feeling more confident as a result of dropping their nervousness. Moreover, the study has also emphasized that memory strategies can assist students to learn collocations, and thus, provide longer retention. Therefore, the students need to be trained in how to best develop their collocation learning through memory strategies.

Three sub-memory strategies employed in the present study: Imagery, Making Acronyms, and Grouping. "Imagery" represents the method by which way the students link the collocation to a visual image. Oxford (1990) stated that chunks of information can be effectively packaged and transferred to long-term memory through visual images. Moreover, imagery is

one of the most powerful devices that can help students to recall verbal material.

Moreover, “*Making Acronyms*” refers to the method in which the students select only one letter from each collocation to assist them in remembering it rather than remembering all of the letters of each collocation. This strategy helps the students to reduce the collocation to a set of letters to help them to retain the information more easily.

Lastly, “*Grouping*” refers to the way that students group a set of collocations into categories or into its part of speech in order to remember them. It received the highest mean score which meant that the students had most frequently employed this strategy in their collocation learning. The target collocations were accordingly focused on only four verbs which represented the verbs that EFL learners make the most mistakes with. Therefore, when the students were grouping the collocations, they could easily separate the collocations into 4 groups which had been distinguished by those four different verbs. These results are similar to the findings from several studies. Studies by Soler (2012), Nemati (2009), and Marban & Amoli (2012) supported the premise that these sub-memory strategies (i.e., imagery, making acronyms, and grouping) were one of the best ways to help the students to store and retrieve new information.

However, there are many students who rarely use the memory strategies, because they are not aware of how to actually use them (Oxford, 1990). Thus, applying memory strategies is one good method to help the students to acquire long-lasting knowledge. The teaching portion of collocations should focus on increasing the students’ retention instead of increasing their study time. Therefore, by applying memory strategies the long-lasting retention of knowledge can be promoted which is the aim of education (Nemati, 2009).

The Impact of Memory Strategies

Memory strategies were found to be effective in raising awareness and increasing collocational knowledge. With the memory strategies, the students had learned how to apply the strategies as they worked through the exercises. Researchers, including Ghorbani & Riabi (2011), Marzban & Amoli (2012), Nemati (2009), Sozler (2012), and Zahedi & Abdi (2012), have all supported the effectiveness of memory strategies in vocabulary learning.

Firstly, memory strategies help the students to gain knowledge of collocation through noticing and practicing them (Lewis, 2000). By examining the students’ scores of the exercises, it was found that the students had been able

to reduce their collocation mistakes. In the sessions, the students were first introduced to collocations and memory strategies before the training portion began. The training included matching exercises and upon completion, the students received comments and suggestions about their work. Throughout the process of the training, the students were able to practice and gain additional knowledge about learning collocations via memory strategies. Therefore, it can be stated that memory strategies had helped the students to gain more collocational knowledge.

Secondly, besides “mis-collocations”, which should be suggested in the language classroom, memory strategies also can help the students in raising awareness of collocations. Accordingly, collocations represent an important aspect of language learning and therefore, should be included in the EFL classroom. Memory strategies are effective methods of helping students to raise their awareness of collocations. The results from the questionnaire indicated that the students had realized that memory strategies represented a beneficial way to help them remember collocations more efficiently and more quickly. The teachers should include memory strategies when they teach the students about collocation learning. Moreover, the students should learn how to apply memory strategies in their collocation learning while the teachers give comments and some suggestions to them. All of these could also assist the learners to raise their awareness of collocation usage.

Some Implications for Teaching Collocations & Further Studies on Thai students

Two implications can be derived from the data: 1) memory strategies can help the students in collocation learning and 2) students require instruction and practice in how to apply memory strategies. Therefore, language teachers should include memory strategies in the curriculum when teaching students of all every level. Moreover, when teaching new vocabulary in the first class, memory strategies should be introduced. In addition, when teachers are focusing on ways to teach vocabulary, methods, such as memory strategies, should be suggested and implemented in order that students may become more aware of vocabulary. Therefore, by paying greater attention to the usage of memory strategies the students will be assisted with their vocabulary learning. In addition, the students could be introduced to other types of language learning strategies (e.g. cognitive strategies, compensation strategies or metacognitive strategies, etc.) in order to introduce them to suitable methods to further enhance their learning.

Since this study was conducted to investigate the students’ frequency of memory strategies use for in collocation learning, there were no Pre-test scores to

compare with Post-test scores. Thus, in order to see the impact of memory strategies on collocation learning, further studies, that focus on investigating the effectiveness of collocation learning through the utilization of memory strategies by means of comparing the Pre-test and Post-test scores, should be carried out.

Conclusion

Learning collocation through memory strategies was shown to have a positive impact on students' collocation use and to help the students to better remember vocabulary. Moreover, it is a beneficial way to help students to gain a greater awareness of collocations. To implement this strategy, the students were presented with memory strategies as vehicles for learning collocations by completing collocation exercises. As they were worked on the exercises, they received suggestions from the teachers. In order to increase collocation awareness, students were able to practice and learn collocations by applying the memory strategies. Since collocation usage is needed in language learning, memory strategies are one of the effective ways to help EFL learners.

REFERENCES

- [1] Asgari, A., & Mustapha, G. (2011). The type of vocabulary learning strategies used by ESL students in university Putra Malaysia. *English Language Teaching*, 4(2), 84-90.
- [2] Attar, E., & Allami, H. (2013). The effects of teaching lexical collocations on speaking ability of Iranian EFL learners. *Theory and Practice in Language Studies*, 3(6), 1070-1079.
- [3] Bazzaz, F., & Samad, A. (2011). The use of verb noun collocations in writing stories among Iranian EFL learners. *English Language Teaching*, 4(3), 158-163.
- [4] Bhumadhana, S. (2011). A study of the use of academic verbs collocations and the English writing ability of undergraduate English major students. *An Online Journal of Education*, 6(1), 1891-1950.
- [5] Boonyasquan, S. (2009). An Analysis of Collocational Violations in Translation. Master of Arts Thesis in English, Faculty of Humanity and Social Science, Srinakharinwirot University.
- [6] Chou, P. (2011). The effects of vocabulary knowledge and background knowledge on reading comprehension of Taiwanese EFL students. *Electronic Journal of Foreign Language Teaching*, 8(1), 108-115.
- [7] Conzett, J. (2000). Integrating collocation into a reading and writing course. In M. Lewis (Ed.), *Teaching collocation: Further development in the lexical approach*. (pp. 70-87). Oxford: Oxford University Press.
- [8] Duan, M., & Qin, X. (2012). Collocation in English teaching and learning. *Theory and Practice in Language Studies*, 2(9), pp. 1890-1894.
- [9] Fan, M. (2009). An exploratory study of collocational use by ESL students; a task based approach. *System*, 37, 110-123.
- [10] Firth, J.R. (1957). Modes of meaning. In Firth, J.R. (Ed.). *Papers in Linguistics*. (pp.1934- 1950). London: Oxford University Press.
- [11] Ghorbani, M., & Riabi, N. (2011). The impact of memory strategy instruction on learners' EFL vocabulary retention. *Theory and Practice in Language Studies*, 1(9), 1222-1226.
- [12] Goudarzi, Z., & Moini, M. (2012). The effect of input enhancement of collocations in reading on collocation learning and retention of EFL learners. *International Education Studies*, 5(3), 247-258.
- [13] Harmer, J. (2001). *The practice of English Language Teaching*. (3rd Edition). London: Pearson Education.
- [14] Hashemi, M., Azizinezhad, M., & Dravishi, S. (2012). Collocation a neglected aspect in teaching and learning EFL. *Procedia- Social and Behavioral Sciences*, 31, 522-525.
- [15] Hill, J. (2000). Revising priorities: From grammatical failure to collocational success. In M. Lewis (Ed.), *Teaching collocation: Further development in the lexical approach*. (pp. 47-69). Oxford: Oxford University Press.
- [16] Liu, L. E. (2002). A Corpus-based lexical semantic investigation of verb-noun miscollocations in Taiwan learners' English. Unpublished M.A. thesis, Tamkang University, Taiwan.
- [17] Lewis, M. (Ed.). (2000). *Teaching collocation: Further development in the lexical approach*. Oxford: Oxford University Press.
- [18] Marzban, A., & Amoli, F. (2012). The effect of mnemonic strategies instruction on the immediate and delayed information retrieval of vocabulary learning in EFL elementary learners. *Procedia - Social and Behavioral Sciences*, 46, 4957 – 4961.
- [19] McCarthy, M., & O'Dell, F. (2005). *English collocations in use*. Cambridge: Cambridge University Press.
- [20] Mongkolchai, A. (2008). A study of university students' ability in using English collocations. Master's Project, M.A. (English). Bangkok: Graduate School, Srinakharinwirot University.
- [21] Nation, I.S.P. (2001). *Learning vocabulary in another language*. New York: Cambridge University Press.
- [22] Nemati, A. (2009). Memory vocabulary learning strategies and long-term retention. *International Journal of Vocational and Technical Education*, 1(2), 14-24.
- [23] Nesselhauf, N. (2005). *Collocations in a learner corpus*. Amsterdam: John Benjamins.
- [24] Nouralian, R., Jahandar, S., & Khodabandehlou, M. (2013). The influence of vocabulary knowledge on Iranian intermediate EFL learner's speaking ability. *Indian Journal of Fundamental and Applied Life Sciences*, 3, 188-192.
- [25] Oxford, R. (1990). *Language learning strategies: what every teacher should know*. Boston: Heinle and Heinle Publishers.
- [26] _____. (2003). *Language learning style and strategies: an overview*. *Learning Styles & Strategies/Oxford, GALA*, 1-25.
- [27] Radhi, A. (2013). Collocations and the practice of TESOL. *International Journal of Bilingual & Multilingual Teachers of English*, 2, 49-54.
- [28] Shahov, V. (2012). Measuring L2 receptive and productive vocabulary knowledge. *Language Studies Working Papers*, 4, 37-45.

- [29] Sinclair. (1991). *Corpus, concordance and collocation*. Hongkong : Oxford University Press.
- [30] Sozler, S. (2012). The effect of memory strategy training on vocabulary development of Austrian secondary school students. *Procedia - Social and Behavioral Sciences*, 46, 1348 – 1352.
- [31] Supanfai, P. (2009). Thai students' English collocation awareness and collocational ability: a case study of second year students majoring in English for international communication at Mahasarakham University. Master of Arts Thesis, M.A. (English). Mahasarakham University.
- [32] Wang, C. J. (2001). A study of the English collocational competence of English majors in Taiwan. Unpublished M.A. thesis, Fu-Jen Catholic University, Taiwan, R.O.C.
- [33] West, M., & West, M. P. (Eds.). (1953). *A general service list of English words: with semantic frequencies and a supplementary word-list for the writing of popular science and technology*. Addison-Wesley Longman Limited.
- [34] Wilkins, D. A. (1972). *Linguistics in language teaching*. London: Edward Arnold.
- [35] Woolard, G. (2000). Collocation - encouraging learner independence. In Lewis, M. (Ed.), *Teaching collocation: Further development in the lexical approach*. (pp.28- 46). Oxford: Oxford University Press.
- [36] Wu, S. (2010). Supporting collocation learning. Retrieved September 13, 2016, from <http://hdl.handle.net/10289/4885>.
- [37] Yan, H. (2010). Study on the causes and countermeasures of the lexical collocation mistakes in college English. *English Language Teaching*, 3(1), 162-165.
- [38] Zahedi, Y. & Abdi, M. (2012). The impact of imagery on EFL learners' vocabulary learning. *Procedia- Social and behavioral Sciences*, 69, 2264-2272.
- [39] Zimmerman, C. B. (1997). Does reading and interactive vocabulary instruction make a difference? An empirical study. *TESOL Quarterly*, 31, 121-140.

The Phenomenon of Demolition of Radio Bung Tomo Cultural Heritage Based On The Law Number 11 in the Year 2010 and Surabaya Regional Regulation Number 5 in the Year 2005

¹ Parlaungan Iffah Nasution, ² Leny Yulyaningsih, ³ Lisda Bunga Asih

^{1,2} Department of Public Administration, Airlangga University, Surabaya, Indonesia

³ Department of Sociology, Airlangga University, Surabaya, Indonesia

E-mail: ¹ parlaunganinasution@gmail.com, ² lenyyulyaningsih02@gmail.com, ³ lisdabungaasih@gmail.com

ABSTRACT

The cultural heritage building is one of the characteristics of the Indonesian Nation. Surabaya as a historic city in seizing the independence of Indonesia, making it became City of Hero, which there are many buildings with historical value. Radio Bung Tomo cultural heritage building became one of the historical evidence of *arek-arek Suroboyo* struggle in seizing the independence. In 2016, there is a reality that the building of Radio Bung Tomo Cultural Heritage has been dismantled by its owner. The demolition of Bung Tomo Radio, which is one of the cultural heritage buildings in Surabaya, received attention from the people of Surabaya and showed some problems in the management of cultural heritage in Surabaya. This research was conducted to describe the phenomenon of demolition of Radio Bung Tomo Cultural Heritage related to the Law No. 11 Year 2010 and Surabaya Regional Regulation Number 5 Year 2005 in Surabaya.

This research uses qualitative research method with descriptive research type. The collecting methods used were interviews and observations to obtain primary data and literature studies to obtain secondary data from publications related to the demolition of Radio Bung Tomo cultural heritage. The method of analysis is inductive that begins from data collection then the researchers do the categorization. The results of this study found several problems related to the demolition of Radio Bung Tomo among them is the coordination of inter-stakeholder has not been established maximally because there is no clear path in the management of cultural heritage, the foundation of policy at the regional level does not refer to the policy at the central level (in this case Surabaya City against Cultural Heritage Act), and lack of supervision from the Surabaya Heritage Reserve Team. Therefore, the necessary policy alternatives include strengthening coordination among related institutions, the revision of regional regulations No. 5 of 2005, as well as the restructuring of the cultural preservation team of Surabaya.

Keywords: demolition, cultural preservation, and alternative policies

I. INTRODUCTION

Cultural preservation is part of the nation's identity relating to the history of the nation that certainly is not owned by other nations. According to the institutions No. 10 of 2011 on the articles of general provisions, the Cultural Preservation is a cultural heritage of Heritage Objects, Heritage Buildings, Cultural Heritage Structure, Heritage Sites, and Heritage Areas on land and / or water conserved its existence because it has an important value for history, science, education, religion, and / or culture through the process of determination [3]. Surabaya as an area that had experienced colonization shows the importance of preservation of cultural heritage in *arek-arek suroboyo* struggle in seizing and defending Indonesia independency.

Indeed, history could build the spirit of a nation to conserve the cultural value of cultural heritage that

serve as a proof of nation's struggle. Long history of Surabaya development has record a lot of historical old building and become the proof of city's development. Some of the building that is served as a basis of the struggle to defend the nation's independence is formulated and agreed upon as a symbol of struggle, thus made Surabaya as a city of heroes. Local regulation No. 5 of 2005 becomes one of the proofs of government supports towards the conservation of cultural heritage in

Surabaya. Historical building conservation through the regulation stated that the building and/or the surrounding of cultural heritage is one of the culture properties that must be conserved to remind us of our nation identity and national interests. One of the culture heritages building that becomes the historical proof in Surabaya is Bung Tomo broadcasting home also known as radio Bung Tomo, radio Bung Tomo has become one of the place used for Bung Tomo to move *arek-arek suroboyo* against the invaders. He speaks to burn the passion of *arek-arek suroboyo*. This building is formally

established as a culture heritage building in 1996, and the next two years, the mayor's decree No. 188.45/004/402.1.04/1998 of 101 establishment of culture heritage site in Surabaya is publicly released.

Bung Tomo Radio was a vital communication media back in the day. This radio starts airing since October, 15 1945, 3 days after PPRI formed. In one of the rooms of the house, Bung Tomo along with Ktut Tantri and some of their friends formed Indonesian Republic Rebellion Radio studio with a portable transmitter. That studio is forcefully built because back then, RRI still doubts the involvement of Bung Tomo. In that room, the flame of November 10 war is burned. Hundreds of thousands fighter taking up their arms to fight the invaders, thus making Surabaya renown as the city of heroes. Now, this culture heritage building is no more, it has been demolished by the owner of the building.

This demolition of radio Bung Tomo is considered violating the Law no.11 of 2010 and 2005 Surabaya's local regulation no.5. This research is become interesting because the culture heritage building that supposedly protected by the authorities is demolished and left no trace of historical evidence. Culture heritage is observed directly by the head of culture and tourism department, culture heritage team, and the district head in the area shows how important the culture heritage is. Thus, in this research, the researcher want to learn pheomenon of Bung Tomo radio demolition that related to the Law number 11 of 2010 and 2005 Surabaya's local regulation number 5.

II. LITERATURE REVIEW

A. Cultural Heritage

According to Law no. 11 of 2010, Nature preserve is a cultural inherintace which is have material form such as Cultural Heritage Object, Cultural Heritage Structure, Cultural Heritage Site, and Cultural Heritage Region in the land and/or water which needs to be preserved because it has an important value for history, science, education, religion, and/or culture trough the determination process. Determination is the status granting of Cultural Heritage to object, building, structure, location or geographical space unit undertaken by the government on the recommendation of Cultural Heritage Experts Team. Cultural heritage itself is controlled by the state but can be owned by an individual as the owner of a cultural heritage. Nevertheless, the existence of cultural heritage is arranged to be preserved

based under prevailing rules. In the determination process, enhancement, and removal of cultural heritage conducted by Cultural Heritage Team which is a group of conservation experts from various sciences who have a certificate of competence to provide recommendations on cultural heritage. Beside cultural heritage team, the organizer of cultural heritage conservation also supported by conservation experts and curators. Cultural heritage determination in Indonesia have several criteria that are 50 years old or even older, representing the 50 years old shortest style, has a special meaning for history, science, education, religion, and/or culture; has cultural value to strengtening the nation's personality.

B. Good Governance

According to UNDP (1997) explained that Good Governance have several characteristics that are legitimacy, freedom to be organized and a participate, as well as press freedom, justice and law supremacy, transparency and bureaucratic accountability, effective and efficiency public sector management, accessibility of adequate information, and cooperative government with citizen. From those characteristics, State Administration Institution of Indonesia Republic (LANRI) reapply the priciples of good governance which is participation, law supremacy, transparency, responsiveness, consensus orientation, equality, efficiency and effeictivity, and strategic vision [6].

Indonesia Transparency Community (2002) explained that good governance is the agreement between government, community, and private sector in which the agreement constitutes the entire process, system, and institution that equal between all of three sectors. Good Governance more likely too see how the government can be a bridge for the interests of the private sector and community [7].

According to Imawan (2002), good governance is a power sharing by the state in regulating economic and social resources for development community. Economy aspect and social community is the main aspect that power sharing is needed especially in the decision-making. Decision-making need to involve private sector and community. So, based on statemen above, then Good Governance is a decision-making system between private government, and community which is concerning the life of country and nation. Therefore, those system require appropriate characteristics according to what is delivered by Lembaga Admnistrasi Negara Republik Indonesia (LAN-RI) [7].

III. METHODOLOGY

A. Research Approach

The use of qualitative descriptive method is to describe the observers' written or verbal words in shape, function, and meaning to get the representative data. In order to gain the validity, the data are collected from direct observation research that can be justified.

B. Informant Determination

Researchers use *purposive sampling* method to arrange the schedule and the criteria of the informant that have been made before.

C. Technique of Data Collection

The author gains the data from *in depths interview* and *observation* as the primary data and it supported by literary source as the secondary data from books and internet.

D. Technique of Data Analysis

The researchers use triangulation technique to establish the degree of trust in data examination. In source triangulation, the researcher uses various sources that focus on the issues. In addition, the researcher also collecting the data through interviews the *key informant* and documentation. Thus, in checking the accuracy of the data, it is necessary to compare the results from the data collection before.

IV. DISCUSSION

Bung Tomo Radio is one of the historical heritages in Surabaya. It was the place where Bung Tomo used to evoke the struggle of *arek-arek Suroboyo* at that time. Although it was not the only radio broadcasting used by Bung Tomo, this radio remains a witness to the history of Surabaya. In 1988, Bung Tomo Radio was designated as a cultural heritage building in Surabaya based on Decree No. 188.45/004/402.1.04/1998. Through the Decree that issued by the Department of Culture and Tourism in Surabaya, Radio Bung Tomo building deserves to be preserved. However, the fact of the building has been destroyed by PT Jayanatha who has bought the building, raised an objection and a conflict for some parties.

The demolition of Bung Tomo Radio, get rejection problem from several parties such as Non-Governmental Organization (NGO) Bambu Runcing Surabaya and some people of Surabaya itself. It is

proven by some demonstration (movement) and petition made by some parties as policy advocates in Surabaya. The issue has been resolved by the court with a fine of 15 million and PT Jayanatha offered to rebuild. The problem said to be solved because in 1970s Bung Tomo Radio Culture Reserve has ever been restored. This is what makes the argument of PT Jayanatha. Thus, Bung Tomo Radio heritage buildings cannot be reviewed in Law no.11 Year 2010. However, it can be studied through city regulation of Surabaya No. 5 Year 2005. This reality shows that there are several problems that arise such as :

1. There is no network coordination model between the stakeholders.

Coordination that is not synchronizes between institutions with other institutions. In this case, the institutions are from the Department of Culture and Tourism, Department of Cipta Karya, and the managing of the cultural heritage itself is the owner of the cultural heritage. The lack of coordination has made the Surabaya city governments lost its identity as the City of Heroes. But this event became a valuable lesson for Surabaya's Government

2. City regulation of Surabaya city which has not adjusted with the latest law in Indonesia

In preservation of cultural heritage in Surabaya City, the last regulation used as reference has not been referring to the latest law on cultural preservation, Law no. 11 of 2010. But still refers to the Law No. 5 of 1992 on Heritage Objects. This shows that the government's attention to the preservation of cultural heritage has not adjusted to the latest national regulations.

3. The control system on the cultural preservation team is not maximized.

Based on Law no. 11 in 2010, the cultural heritage team has duties to provide recommendations on determination, ranking, and removal of cultural heritage but in the demolition of bung Tomo radio, the cultural conservation team does not give a demolition permit to the building. This shows the lack of control of the cultural heritage team as a team of experts. However, in the supervision of cultural heritage, it is not only the responsibility of the cultural heritage team but also the responsibilities of the relevant government such as the enactment of licensing procedures and the granting of management licenses to individuals.

Policy brief : Problem Solving to Cultural Heritage Conservation

Policy brief could be a solution of cultural heritage problem in Surabaya. Based on data analysis that has been done, the researchers formulate three policy alternatives to solve the problems. The focus of the proposed policy alternatives is not on the rebuilding, but on preventive measures in the future there is no recurrence of similar problems. Also, the City of Surabaya is a city of Heroes with various cultural heritages in it. Here it is :

1. Creating a communication network model between involving sides to prevent miscommunication

The process of licensing and the result need to be known by the supervisory team. The supervisory team also needs to go to the field to know exactly the activity that is happening in the culture reserve location. The coordination between the lines needs to be strengthened so that problems surrounding the culture reserve location can be minimizes. Especially because Surabaya as the City of Heroes, surely contain plenty of historical culture reserve locations that can be used for further development of science. This communication network model is sustainable by a vessel that connects all sides involved in the preservation of culture reserve locations in Surabaya. The aim is to make the management transparent to the communities and in turn the communities can participate in the preservation.

2. Revising parts of Surabaya Regional Regulation No 5 of the Year 2005 to make it align with new policy; Law no 11 of the Year 2010,

First, The concept of culture reserve. According to the Regional Regulation, culture reserve means the building and the surrounding environment. Whereas in the Law, culture reserve includes buildings, structures, sites, and the surrounding environment. This meant for the institutions that handle the licenses and preservation of culture reserve locations have the same concept regarding culture reserve.

Second, it is the criminal law in Regional Regulation no 5 of the Year 2005 which still use Law no 5 of the Year 1992 about cultural heritages need to be revised to 1 year jail minimum and 15 years maximum and/or a fine of 500 million rupiah at minimum and 5 billion at maximum in accordance with the criminal law in Law no 11 of the Year 2010 about cultural heritages.

This is meant for preventive act to make all sides more cautious when handling cultural heritages.

3. Restructuring the culture reserve team to support the maintenance of cultural heritages location in Surabaya.

Strengthen the culture conservation team by involving professional organizations like Indonesia Archeologist Team, Indonesia Architects Union, Indonesian Historian Communities, and other organizations. The need of e-government mean member of the management doesn't only come from organizations which specialized in history, but also can come from IT department that can help managing the connection network between all parties as a model of coordinated network between the government and communities.

V. CONCLUSION

Radio bung tomo is one of historical evidence in Surabaya. The cultural heritage showed the struggle of bung tomo when tried to evoke the spirit of *arek arek Suroboyo* to freedom. Recently, the demolition Radio Bung Tomo cultural heritage has shown some problems in the management of Surabaya cultural heritage. Good Governance is the concept of decision-making by involving three sectors such as the public sector, private sector, and the community. Radio Bung Tomo should be back on the principles of Good Governance. Cultural heritage team have planned to rebuild that building but the documents the history of Radio Bung Tomo is not complete. There are some problem in this case such as There is no network coordination model between the stakeholders, city regulation of Surabaya city which has not adjusted with the latest law in Indonesia , and The control system on the cultural preservation team is not maximized. Then, there are policy brief that solve the problem such creating a communication network model between involving sides to prevent miscommunication, Revising parts of Surabaya Regional Regulation No 5 of the Year 2005 to make it align with new policy; Law no 11 of the Year 2010, Restructuring the culture reserve team to support the maintenance of cultural heritages location in Surabaya.

REFERENCES

- [1] Alexander, H. B. (2016). Pembongkaran Bekas Kantor Radio Bung Tomo, Potret Ketidakperdulian Warga Kota Surabaya. Surabaya: <http://properti.kompas.com/>.

- [2] Hakim, A. (2016). KBRS Pertanyakan Kelanjutan Penyidikan Pembongkaran Rumah Bung Tomo. Surabaya: www.antarajatim.com.
- [3] Kementerian Pendidikan dan Kebudayaan. (2017). Undang-undang 11 Tahun 2010 tentang Cagar Budaya. BPCB GORONTALO: <http://kebudayaan.kemdikbud.go.id/bpcbgorontalo/wp-content/up>.
- [4] Moleong, L. J. (2012). Metode Penelitian Kualitatif (edisi Revisi). Bandung : Remaja Rosdakarya .
- [5] Pemerintah Kota Surabaya . (2005). Peraturan Daerah Kota Surabaya No. 5 Tahun 2005 tentang Pelestarian Bangunan dan/atau Lingkungan Cagar Budaya . Surabaya: jdih.surabaya.go.id.
- [6] Soeprapto, R. (2003). Pengembangan Kapasitas Pemerintah Daerah Menuju Good Governance. Jurnal Ilmiah Administrasi Publik FIA Universitas Brawijaya, 4.
- [7] Tomuka, S. (2013). PenerapanPrinsip-Prinsip Good Governance DalamPelayanan Publik Di Kecamatan Girian Kota Bitung (Studi Tentang Pelayanan Akte Jual Beli). Jurnal Politico, 13.

Maduranese Meaning About Carok

Case Study in Sampang Regency, Madura Island

Purwati Ayu Rahmi

Student of Universitas Airlangga

Surabaya, Indonesia

E-mail: Ayurahmi93@gmail.com

ABSTRACT

Carok is an act of fighting as an expression of Madura's men to defend self-esteem when they feel harassed by others men and as symbol of virility even end by dying one or both the fighter. This action is closely related to the cultural values that are used as guidelines for the Madura People behavior then carok can not be equated with cases of criminal murder in general also it can be done with deliberation between both side. These activities can not be justified in religious or legal views but the people there still much choose the carok as a way to resolve the conflict. The purpose of this study is to know the history of carok, how people interpret the tradition of carok in resolving conflicts in society and how people suggestion to minimize Carok Case. The method used in this research is qualitative descriptive describing data in the form of written or oral words of people and behavior observed in a field. The findings of this study, the origin or history of carok become various, but the history of the most trusted people is the characterization of Sakera as a hero who uses carok to defend of the small people. Currently, Carok is interpreted as a mechanism of conflict resolution to uphold individual or family self esteem, instead the closer family from dying fighter such as son, father and brother could fight back the murderer. It is because Maduranese believe that their self-esteem is more valuable than life. The literary reference to the carok is very limited, the writings of ancient times vary in depicting the history of carok itself. The informants said that Carok does not happen as often as the past because almost every young generations today have education at school better. But the efforts that be done or minimize the Carok is still important by deliberation between family or community by helping of religious and traditional leaders, the justice of the law, Then the next solution to consider is to maximize access to education and the economy, because most people who have low economies and education use carok as an alternative conflict solution)

Keywords: Carok, Maduranese, Culture, defense of Self-Esteem

I. INTRODUCTION

Society and custom are two things that can not be separated each other. Interestingly, each community group has different customs so that it becomes the hallmark of the group. In Indonesia for example, The Madura tribe that has a distinctive characteristic with dialect, appearance, work, clothes and so on. The Madurese community in Indonesia is known as a society that has strong character, unique, stereotypical, stigmatic and distinctive culture. Those typically refer to Madurese entity has a speciality cultural unlike the ethnography of other communities in Indonesia, Alwi [2]. The Madurese cultural differences or uniqueness often is led other ethnic groups Madurese seeing this as absurd behavior. For example, Madurese are known as cranky, then choose the alternative solution to their irritation through physical violence, usually a *Carok*, Taufiqurrahman [6].

Carok is an action or assassination attempt using a sharp weapon, generally sickle among two men who one of them considered to harass self-esteem. The motive or background of the *Carok* event is mostly due to problems of disruption wife or fiancée, misunderstanding, seizure of land or inheritance, bad debts and other unknown reasons. *Carok* in the phrase Madura likened to "*Lebbi Bagus Pote Tollang atembang Pote Mata*" which means (Better to die, than life to bear the shame), Wiyata [7]. *Carok* is at the crossroads of tradition in society and *Carok* as a form of violent crime that is very disturbing to society as well as actions that are not justified by the State and religion as classified to the act of vigilante (eigenrichting).

The tradition of *Carok* by people outside Madurese is understood as a peculiarity of customs and also legal violations that are legalized by society. So that Madurese people in some areas imaged as a impolite, rude, violent, and cranky. However, not infrequently all people label that, that images will be gone after they make real communication with Madurese. The

background make author interested to study *Carok* in Madurese perspective by focusing on the study of how the history of *Carok*, and how Madurese people interpret the *Carok* currently because of the difference *Carok* meaning today from the past and how people suggestion to minimize Carok Case. So this study is expected to give a complete picture of the *Carok* that is understood by Madura community so that all people and reader can open their minds if Madurase have a good attitude and characteristic.

II. LITERATURE REVIEW

The most powerful and prominent labeling of Madurese ethnic group is physical violence that leads to fight armed with sickle popularly known as Carok. Carok tradition in Madurese community is a manifestation of the desire to defend self-esteem and family honor. The use of carok tradition is expected to rehabilitate the impact of self-esteem harassment, otherwise the family honor in the community's view has no value, Asis [3].

All of Carok's cases are initiated by specific conflict such as occurrence of disturbance a wife by other man, fraud accusations, seizure of inheritance, vengeance), all of them are referring to the same thing, that is harassment of self-esteem (dignity). To recover their harassed self-esteem, they do Carok, which is always supported by social environment. The man who success lose their enemies show a feeling of relief, satisfaction and pride, Wiyata [7]. Wiyata continues, the occurrence of Carok is closely related to a lot of conditions, such as, first, the socio-cultural conditions that bring a hoodlum into social status at the upper level in the social structure of Madurese community. Second, the condition of some judicial officers' behavior who do not consistently apply and enact laws in accordance with legislation, so that the legal judgments taken are very unsatisfying the sense of justice for local communities. Third, until now, socio-cultural conditions in Madura have not known any institution that serves and acts as a deterrent or antidote to the occurrence of Carok, Wiyata [7]. Ignoring the facts, Madurese seem to have two opposing personalities. They do not hesitate to easily shed blood if their self-esteem and honor are disturbed. The stubborn is reflected in Carok. On the contrary, they have the tenderness of the yarn-like nature which is reflected in Madurese attitude of life which assumes that all people are brothers, Abdurrahman [1].

The study of carok has been done by Hidayat with the title of "Philosophy of Carok Study on The

Nature of Appreciation and Disharmony in Carok Tradition". This research is a literature research. Research shows, the nature of carok tradition in terms of ontology, the cause of Carok is based on self-esteem and socio-cultural factors. Epistemologically, Carok is an instrument to maintain self-esteem must be done in order for an individual to be respected and acknowledged as a worthy party. Axiologically, self-esteem has a spiritual and socio-cultural value containing an ethical value by Hidayat [4].

III. METHODOLOGY

This researcher uses qualitative methodology, collecting data from informants on descriptive data in the form of written or oral words of people and behavior that can be observed thoroughly about the form, function and meaning of expression by Robert and Taylor [5]. This research chose two villages in a sub-district in Sampang. Those are Pekalongan Village, Sampang District and Temoran Village, Omben District, Sampang regency by consideration of the perspective diversity of people who live in the main city of Sampang and people in suburb. Types of data obtained from this study are primary data obtained through observation and interviews to the people of Sampang and secondary data from mass media and other supporting literature such as books or scientific journals.

Determination of informant used in this research is purposive and developed with snow ball. The selected Key informants were local village apparatus: Mr. Nurcholis as staff of Pekalongan Village Office and Mrs. Wayas who was appointed directly by Temoran village head because at the time of data collection the village head was out of town. Then deeper information is searched to other informants in the village of Pekalongan, they are Umi Siti, Mr. Jamaludin, Ustad Zaini, Mrs. Lilik, Nur Cholis and informants from Temoran Village, Wayas, AR, Umar Neto, Sukron, Ma'mun, Ustad Rozaq. The secondary data is obtained from previous books and researches.

HISTORY OF CAROK

Based on the description of De Jonge the emergence of acts of violence in the life of Madurese are caused by two important things. The first was the government at that time did not pay attention to the Madurese and the second is as a consequence of the first cause, the community became distrustful to the

government, thus any problems or conflicts were resolved in their own way in violence regardless of the rules. The solution intended is Carok. In 1700s VOC began to control Madura. At that time there were three kingdoms politically given the right and authority by VOC to take care of its own government. Thus the king of Madura freely determined forced labor, withdrawing income tax or money tax. The longer the community felt very miserable and the condition of land that barely could support the community. The belief in the law was gone. Criminal acts were everywhere and people sought solutions in various ways of self-help. Citing a report of a government official, Brest Ban Kempen who became an assistant resident in Bangkalan in 1847-1851, said the court was not working and the bodies of the victims were dumped in the town square and virtually no judicial proceedings. Even if there was a judicial process, suspects and witnesses were held in prison for months without trial. In the 19th century the colonial government forbade to bring a sharp weapon because at that time a sharp weapon as if to hoard Madura strait. But the result of this policy is nil, because the root of the problem was the feudalistic government elite. According to De Jonge in Wiyata [7] the situation in Madura began to change direct government system was applied.

Refer to the search of articles written by Madurese in electronic media, carok history emerged among the Madurese since the era of Dutch colonialism in 18th century. Carok is a knight symbol in the fight for self-esteem (honor). Clurit began to appear in the age of Sakera legend. Clurit was used by Sakera as a symbol of resistance of commoners against Dutch colonizers. Instead for Dutch, Clurit was symbolized as a weapon of criminals. Those Dutch efforts were apparently managed to penetrate some Madurese and become the philosophy of their life. When there are problems, infidelity, seizure of land, and so on, Carok is always the solution for upholding self-esteem. Similarly, when doing crime, also using clurit. Such conditions eventually, drive people outside Madura to label Madurese like to perform Carok and and being rough. Meanwhile not all of Madurese live that way. Madurese have a subtle attitude, know good manners, do not like to quarrel. Carok behavior is the descendant of the ancient people who aimed against Dutch colonizers. After so many years of Dutch colonialists left the island of Madura, Carok culture and using clurit to finish off his opponent still exist, whether in Bangkalan, Sampang, and Pamekasan. They think that culture is the creation of his ancestors, not aware that it is the results of the Dutch colonial falsity.

Characterizing Sakera with a soul of a knight eradicate Dutch colonialism was also expressed by Mr. Rozak. It came from an old Dutch story, Sakera who was born in Sampang, Madura. Sakera eradicated Dutch without fear with his organization (Interviewed with religious figure; Mr. Rozak). Another story that develops about the Sakera figure is that Sakera was a brave knight against the bourgeoisie. He took the wealth of rich people to be distributed to poor people in Sampang. The weapon that used is clurit. However, as time goes by, Carok is misunderstood, Carok becomes a symbol of courage to defend one's personal self-esteem¹. Based on the different early history of Carok it can be concluded that the key problem comes from weak law enforcement by the authorities and also the government system that is not on its people's side. Consequently people prefer to create legal tools that they consider to provide a deterrent to the perpetrators of crime effectively.

UNDERSTANDING OF CAROK BY MADURESE

Carok is an institutionalization of violence that historically has been practiced by several Madurese since several centuries ago. In addition, Carok also starts from the weakness of state authority since before and after independence to control the source of violence and the inability to provide justice to the community. This results, Carok performers are less able to express the language, thus putting forward the aggressive physical behavior in eliminating the lives of people who are considered harassing self-esteem by Wiyata [7].

According to field research, Mr. Jami clarifies Carok is as an instrument to vent the resentment through assassination attempts. This fight is only meant for the act of fighting between men only, because the action of fight between men and women is considered not gentleman. This fight is a form of social control so people can control their behavior, especially in respecting the rights of others, because people still do not fully believe in the existing legal institutions. Because Carok have existed before legal institutions legalized by the government. Carok is generally done by a man when he knows his wife is harassed by another man, because the wife must be kept well by the husband². The people themselves, even those who are aware of the legal system, do not have the courage to interfere in violation of the law between the two parties in conflict. This is because the unwritten rules that are

¹ Interviewed with Woman Figure; Mrs. Wayas

² Interviewed with Public Figure, Mr. Jami

already believed and agreed by Madurese, that between two parties in conflict, the other party cannot interfere³. The unwritten rules still exist due to some people's perspective about law taking sides to person who has good financial ability then they can buy and set the case lighter. So when a conflict occurs, the solution that is considered the fairest is to apply vigilante (Interview with hoodlum; AR).

On the other hand, regarding to Carok as a symbol of men's courage, nowadays the meaning of Carok as a courageous act is rarely encountered. Carok is often engineered by the perpetrators. Carok has now been organized in such a way that the perpetrator has prepared how the legal method will be met. In the same way, a murder could use the role of assassin or the murderer does not have to be jailed⁴. Along with the level of public participation in education in Sampang Regency added by development infrastructures in Madura Island, urban communities have started to leave carok as an attempt to resolve the conflict⁵. Contrarily, some marginalized society in suburbs still legalize carok. Even, to protect themselves from attack unexpectedly, they always save a sickle behind their backs so they can fightback⁶.

All findings conclude carok as a mechanism for resolving conflicts especially when a Madurese man feels his pride disturbed by the other man. The doers choose carok because of the system of law cannot give them the consistent justice to poor people. Even, the aware people in law do not have a big bravery to make the fighter burying the hatchet. Majority cases happen in suburbs area with low quality of education.

EFFORTS TO MINIMIZE CAROK

In accordance with the applicable law in Indonesia, as stipulated in Legal Criminal Code, Carok is categorized as murder (article 338 and 340) or persecution (article 351, 353, 354, 355) so that the perpetrator must be jailed for years or even sentenced death. However, the public assumption, the law does not go like that. Carok perpetrators serve only a minor punishment and their role as perpetrators can be replaced by other parties. The impact of this affects the people's

skepticism in the legal institutions of the police and judicial institutions. Society understands the legal constraints on lower-class economic society. On the other hand, because Carok has become a habit, people already understand the rules of the game and choose not to intervene when Carok takes place. One way to reduce the case Carok by involving tradition leaders, religious leaders and even informal characterizations such as hoodlum (tojing or baging in Madurese Language)⁷. For example, one of the religious leaders who are considered to be able to reconcile the two sides of the family is Religious leader who comes from the district Omben, Sampang regency. He brought both sides who promised to make peace. The public believes that if the promise is violated then he will get injured⁸. The role of the two families is also one of the options to resolve Carok that runs through generations, meetings between two ancestors or people who are considered elder to end the dispute between the two families. So that there is no longer vengeance between both families⁹.

Other mechanism to minimize Carok is through education and religion. Carok occurs due to the lack of education and knowledge of whole Islamic religion, especially in the suburbs¹⁰. In his book, Wiyata clarifies the lack of education as a factor that causes Madurese to be provoked by the conflicts of every socio-economic problem affecting the region. Moreover, the social issues are offensive and involving self-esteem¹¹. This statement was supported by Mrs. Wayas and Mr. Umar Neto. Madurese are poorly educated, it was rarely found Madurese who were able to finish junior high school, high school, consequently their thoughts are old-fashioned and easily stuffed by something that is not good because their parents are not educated. In contrary if parents are already educated, parents will lead the children not to choose a Carok as a decision to end the self-esteem conflicts. The following is data of school participation rate in Madura Island and East Java. The data shows, the education level of Junior school and Senior High school of Madurese is still below the average of APS East Java province except the Senior high school level from Pamekasan Regency.

Table 1. School Participation Number in East Java and Madura Island in 2013

⁷ Interview with Woman Figure, Mrs. Wayas

⁸ Interview with Staff Administrative in Pakalongan Village; Mr. Nurcholis

⁹ Interview with Woman Figure; Mrs. Lilik

¹⁰ Interview with religious Figure, Ahmad Zaini

¹¹ Wiyata, Op Cit

³ Interview with Woman Figure, Mrs. Wayas

⁴ Interview with Staff Administrative In Pakalongan Village; Mr. Nurcholis

⁵ Interviewed with a Collegian, Ma'Mun

⁶ Interviewed with Religious Figure; Ahmad Zaini

| No | Area | Primary school | Junior school | Senior school |
|----|--------------------|----------------|---------------|---------------|
| 1 | East Java Province | 99,06 | 92,87 | 62,11 |
| 2 | Bangkalan | 98,01 | 82,46 | 48,83 |
| 3 | Sampang | 98,34 | 88,42 | 43,09 |
| 4 | Pamekasan | 99,72 | 92,72 | 59,19 |
| 5 | Sumenep | 98,50 | 90,95 | 65,75 |

Source : Central Bureau of Statistics of East Java Province

Embedding a good education system towards the young generation is very important because education will make young people think about the consequences in taking an action, so Carok actions can be minimized. According to one of the community leaders we interviewed, the need for additional educational facilities or infrastructure and religious knowledge will be able to develop the human resources capacity of Madurese so as to suppress potential of Carok or other potential crime¹². Besides, the importance of the village youth to maintain order, for example, one of the youth leaders in Sampangsub-district mentioned the importance of conducting youth activities and discussion among youth so as to create harmony among youth in their area. It is also transferred to the younger generations in the village through discussion forums and they are as much as possible not to mention the word Carok in their discussion¹³.

In the contrary, one of hooldum who is poorly educated has a different opinion. He believed no matter how high educated Madurese could be, they would do carok. In fact he does not hesitate to tell his son to do Carok if the child's self-esteem is disturbed¹⁴.

The statement of several informants above shows the public's critical attitude about the importance of facilities and infrastructure of good human resource development (HR) in society by the government. The initiatives to stop Carok are also done by parents by providing education and provision of good religion to their children and the existence of an active youth organization to minimize the spread of the tradition of conflict resolution through Carok by not socializing or disseminating all matters related to Carok.

This study supports the study compiled by Hidayat, that Carok is an instrument to maintain self-esteem to be appreciated and acknowledged by others.

Although in Sampang region there are already legal and religious institutions, but most people, especially in the suburbs, they continue to understand Carok as a solute conflict resolution. In contrast to the prismatic worldviews in Sampang region who are more open to new things, they tend to criticize Carok as an attempt to defend self-esteem.

IV. CONCLUSION

Madura tribe, one of the biggest tribe in Indonesia, has a distinctive characteristic with dialect, appearance, work, clothing and so forth. Just same as other ethnic groups with distinctive cultures and customs, Madurese also has a mechanism for resolving conflicts of self-esteem abuse between men and fights known as Carok. Carok is an institutionalization of violence that has historically been practiced by some Madurese people since several centuries ago. The history of carok is defined by society in various ways. The red line from various sources of problems arises from the weakness of law enforcement by the governmental system that puts the people in poor sphere. So the public would prefer to create a resolving conflict by their own that they deem effective to provide a deterrent to the person that started the conflict. Sampang people agree if carok largely often starts from the interference of women who already have husbands by other men, then the husband feels harassed his self-esteem so to cure the heartache the husband must do duel with "Carok", the next cause is slander case, seizure Inheritance, accounts payable and revenge for the dying family member. Carok still occurs because some people still consider the weakness of law enforcement also the lack of public access to education in schools. So it is important for the government to reduce the number of carok cases by providing good education in schools and religious education. As well as the importance of cooperation between government, law enforcement with community leaders and religious leaders.

REFERENCES

- [1] Abdurrahman. Problem of Carok in Madura, Madura III. Indonesia Ministry of Education and Culture, Jakarta. 1979.
- [2] Alwi, Hasan. *Indonesia Dictionary, Third Edition*. Jakarta: Indonesia Ministry of Education and Culture and Balai Pustaka. 2001.
- [3] Asis Safioedin. Carok Is Ordinary Murder Crime, Madura Research Seminar Paper In The

¹² Interview with Public Figure, Mr. Umar Neto

¹³ Interview with Youth Figure; Sukron

¹⁴ Interview with Hoodlum; AR

Framework Of Indonesia-Netherlands Cooperation
For The Development Of Indonesian Studies, Batu-
Malang, 1979

- [4] Hidayat, A.R. and Lasiyo. The Carok Philosophy of
The Study of The Essence of Internalization of
Harmony and Disharmony in the Carok Tradition.
Gadjah Mada University. ND
- [5] Robert C, dan SJ. Taylor. 1975. *Introduction to
Qualitative research Methods: A
Phenomenological Approach to the Social
Sciences*. New York, John Willey & Sons.
- [6] Taufiqurrahman. _____. Madura Cultural Identity.
Pamekasan: STAIN Pamekasan. Unpublished
- [7] Wiyata, Latief. Carok Violent Conflict and Self-
Madurese Pride. Yogyakarta: LKiS. 2002

Evaluating Effects of *Program Keluarga Harapan* (PKH) on School Attendance: Case Study of CCT in Indonesia

Putri Kemala Dewi, Dyanti Rizkika Andani, Amirah Hadi Aqilah

Faculty of Economics and Business

Universitas Padjadjaran

Bandung, Indonesia

ABSTRACT

Objectives: Program Keluarga Harapan (PKH) is a Conditional Cash Transfer in Indonesia which is aided by the government to improve Indonesia's human capital quality in order to gain benefits of Indonesia's demographic bonus in 2020- 2030. The aim of this study are as follows: a.) to know the size of PKH effect to school attendance. b) to know how huge the impact of children's food nutrition, which is represented by the quantity of eating per day, to school attendance

Design: Using a cross-sectional data, the authors analyze 4th wave (2007) and 5th wave of IFLS data. While the independent variables are made up of age, children's educational level, gender, parents' educational level, children's eating frequency, origin (rural and urban are), and another dummy variable, PKH which consists of the treatment group, control group and no program group. This model uses a logit estimation.

Results: PKH has different effects in 2007 and 2014. In 2007, PKH program raises the school attendance among its beneficiaries. However, in 2014, the effect of PKH was indifferent among its beneficiaries and non-beneficiaries. From the literature reviews, it can be concluded that the problem lies in monitoring and evaluating.

Keywords: Program Keluarga Harapan (PKH), Conditional Cash Transfer (CCT), Logistic Model, IFLS

I. INTRODUCTION

The demographic bonus is a condition where the population structure is beneficial for the country development. This is due to the huge number of the productive age, but the young age proportion is getting smaller while the elderly proportion is getting bigger. The demographic bonus could be very beneficial for Indonesians but with a condition that the government, from now on, are able to provide qualified human capital. The quality improvement in human capital could be channeled from education, health, employment, and investment.

According to Jati [6] Indonesia will enter the first wave of demographic bonus in 2017-2019 and the second wave of demographic bonus in 2020-2030. The number of productive age in this time span will reach its maximum point, compared to the non-productive ages of 0-14 years and the elderly. The total of the productive age will be accumulated to 60 million people, or analogically 10 people of productive age will bear 3-4 people of non-productive age. This number can boost national development and growth in all sectors.

The preparation to achieve the demographic bonus in the future is not as simple as it may seem. The government needs to make a well-developed plan on how to prepare qualified human capitals. There are also other challenges that the government needs to tackle, one

of them is the awareness on the importance of education. This can be seen from the low school attendance level in Indonesia. According to Pitt, Rosenzweig & Gibbon [1993], school attendance level is a determining factor of health level and family planning. If the school attendance level is still low, it will increase the probability of dropping out from school. This is the result of school regulation which states that students must meet the attendance criteria in order to take the final exam. This will be a threat for the government to provide qualified human capital in 2020-2030.

The government cannot stand still and let this threat affect the outcome of the demographic bonus in 2020- 2030. One of the government's target is to provide an equal opportunity and improve the facility of primary and secondary education for the poor in Indonesia. One way of realizing it is by improving the quality of Indonesia's human capital through *Program Keluarga Harapan* (PKH).

PKH is one of a social safety net program which is intended for the very poor household or *Rumah Tangga Sangat Miskin* (RTSM). This program is globally known as a Conditional Cash Transfer (CCT). To be a PKH beneficiary, the very poor households must meet the requirement of:

1. Families with pregnant or toddler (under five years old).

2. Families with children aged 5-7 years (pre-school age).
3. Families with children who are in primary school or equivalent (age 7-12 years).
4. Families with children who are in secondary school or equivalent (age 12-15 years old)
5. Families with children aged 15-18 years but have not completed basic education, including children with disabilities.

The government targeted the PKH beneficiaries accumulated to 3.2 million families. Since 2014, the PKH beneficiaries target is modified from households to families. Families are considered a very relevant group because families (father, mother, children) are the ones who are responsible to make sure that education and health are achieved. Also, families are considered to be a more promising group to break the vicious cycle of poverty rather than households.

Even though PKH is a long-term program, but the beneficiaries are not permanent. Families can be considered as beneficiaries as long as they meet the requirements, and not longer than six years. If after six years the families no longer meet the requirements, then they will undergo a natural exit.

This research aims to find out whether *Program Keluarga Harapan* can increase school attendance on its beneficiaries.

II. LITERATURE REVIEW

Before making the hypothesis tests, a short overview of the variables correlation from previous studies is carried out in this section.

A. School Attendance

In a study of (Attanasio, Vera-hernández, Battistin, Fitzsimons, & Mesnard, 2005) which assess the effectiveness of CCT Program in Colombia.

The CCT program, *Familias en Acción* (FA), which is inspired by Mexico's PROGRESA is aimed to alleviate poverty and increase development through education and nutrition channel. The study found that FA succeeds to increase the rate of school attendance in Colombia for aged 12 to 17 in a Rural area 10.1% and in an Urban area 5.2%. Even though for aged 8 to 11, the impact is only 0.1% in Rural Area and 1.4% in Urban Area. Even though for aged 8 to 11, the impact is only 0.1% in Rural Area and 1.4% in Urban Area. But the result is solely because the number to start with for Aged 8-11 both in Rural and Urban Area are already high which are 93% and 95.2%. Therefore,

the scope for improving the school attendance was more limited for children aged 8- 11.

B. Parents Marital Status

Reid (1987) showed that school absence as a psychologies problem resulted from incompetent parents. Besides that, Astone & McLanahan [2] found that growing in a single- parent family and a step-parent family has negative impact in High School attendance. Adding up to that, (Hoyle, 1998) also support the same conclusion that students from single-parent households tend to have lower rates of attendance than students from two-parent households.

C. Children's Gender

Emerson, Souza&Souza [4] investigated the intra-household gender differences and the incidence of child labor and children's school attendance in Brazil. And found that the daughters' school attendance is higher than sons. It is also found that parents invest more education towards sons than daughters. Which is more likely because the returns to education for sons are generally higher than for daughters. Thus, parents who care about the human capital of all children will direct more resources to the children with the highest marginal returns.

D. Parents' Educational Level

Glick & Sahn (2000) found that parents' educational level are very low, specifically for mothers. 75 percent of the mothers taken in the sample have less than a primary education, while the level is 65 percent for fathers. Parents' educational level is proved to have an effect on the children's school attendance. Even though the impact differs between girls and boys. Mothers who finished primary school increases the probability of their daughter's school attendance. While the effects on sons' are not much larger than daughters. Similarly, Emerson et al. [5] concluded that the higher the parents' educational level the higher the probability of their children will attend school. Even though, the probability is different between sons and daughter. A father's education level has a higher probability to increase a son's school attendance than daughter, while a mother's educational level also has higher probability to increase a son's school attendance or equally as a daughter's. Al-samarrai & Reilly [1] found that in Tanzania, a mother's education is a significantly important variable than a father's for children to attend school both in the urban and rural area.

Origin

Al-samarrai & Reilly [1] explores the differences between the rural and urban area in primary school attendance in Tanzania. The study found that there is a 10 percent differences between school attendance in Urban than the rural area for the 10-15 years old group. And the effect is slightly lower for the 7-15 years old group which is 6%. The difference is due to region-specific factors like infrastructure, school availability and school quality. But, if anything else is held constant, the school attendance between those in rural and urban are could be narrowed.

Mother's Age

In Emerson&Souza [4], a bivariate probit model of child labor and school attendance is provided. Using some important variables, one of it are, father's and mother's age but the result is the opposite this variable has little to no effect on children's school attendance in Brazil.

E. DATA AND METHOD

Data

This study uses secondary panel data retrieved from Research and Development (RAND), which is Indonesian Family Life Survey (IFLS). IFLS is a six waves data survey of Indonesian families, which represented 83 percent of Indonesia's population and 30,000 individuals who lived in 13 Indonesia's provinces. (Suryadarma & Pakpahan, 2009).

This study uses 4th wave IFLS data from 2007 and 5th wave data from 2014, the sample consists of 29032 individuals aged less than 15. The 4th wave IFLS data is made up of 67.79 percent primary school students and 18,60 percent middle school students. The 5th wave IFLS data is made up of 63.55 percent primary school students and 20.83 percent middle school students

Method

The sample is analyzed using STATA, and estimated using logistic regression. The dependant variable is a dummy variable, if 1= child's school attendance is more than 25 hours per week and 0= if less than 25 hours per week. While the independent variables are made up of age, children's educational level, gender, parents' educational level, children's eating frequency, origin (rural and urban are), and another dummy variable, PKH which consists of the treatment group, control group and no program group

Model

This model explains the relation between school attendance and PKH:

$$\text{att2} = \beta_0 + \beta_1 \text{age} + \beta_2 \text{agesq} + \beta_3 \text{c_primary} + \beta_4 \text{c_juniorschool} + \beta_5 \text{c_highschool} + \beta_6 \text{male} + \beta_7 \text{foodfreq} + \beta_8 \text{p_noschool} + \beta_9 \text{p_primary} + \beta_{10} \text{p_juniorschool} + \beta_{11} \text{p_highschool} + \beta_{12} \text{p_university} + \beta_{13} \text{urban} + \beta_{14} \text{pkh_treatment} + \beta_{15} \text{pkh_control}$$

F. RESULTS

The logistic regression on IFLS 5th wave data has the following results:

Table 1 Marginal Effect of Regression (IFLS 5th Wave)

| VARIABLES | (1) att2 mfx dydx |
|----------------|-------------------------|
| age | 0.428*** (0.0373) |
| agesq | -0.0167*** (0.00184) |
| c_primary | -0.183*** (0.0269) |
| c_juniorschool | -0.120*** (0.0285) |
| c_highschool | 0.273** (0.128) |
| male | -0.0120 (0.0166) |
| foodfreq | 0.00689** (0.00300) |
| p_noschool | -0.0108 (0.0620) |
| p_primary | 0.0911** (0.0427) |
| p_juniorschool | 0.113** (0.0447) |
| p_highschool | 0.197*** (0.0426) |
| p_university | 0.299*** (0.0437) |
| urban | 0.0477*** (0.0174) |
| pkh_treatment | 0.0724 (0.0848) |
| pkh_control | 0.0397 (0.0796) |
| Observations | 4,483 |

The regression result based on IFLS 5th wave can be interpreted as follows:

- The older a child gets, the higher the probability to attend school more than 25 hours per week, but eventually the chance will decrease, *ceteris paribus*. (Significance level 1%)
- If person A is a primary school student and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.183 percentage points. (Significance level 1%)
- If person A is a junior school student and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.120 percentage points. (Significance level 1%)
- If person A is a high school student and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.273 percentage points. (Significance level 5%)
- Child's gender has no significant contribution on child's school attendance.
- The more frequent a child eat per day, the higher the chance of a child to attend school more than 25 hours per week by 0.00689 percentage points, *ceteris paribus*. (Significance level 5%)
- If person A is a child whose parent is a primary school graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0911 percentage points. (Significance level 5%)
- If person A is a child whose parent is a junior school graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.113 percentage points. (Significance level 5%)
- If person A is a child whose parent is a high school graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.197 percentage points. (Significance level 1%)
- If person A is a child whose parent is a university graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.299 percentage points. (Significance level 1%)
- If person A is a child who lives in a urban area and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0477 percentage points. (Significance level 1%)
- PKH has no significant contribution on child's school attendance.

From the interpretations above, we can infer that in IFLS 5th wave, PKH has no significant effect on child's school attendance. This can be caused by a broader range of aid beneficiaries, making controlling more costly.

Children who eat more in a day are more likely to attend school. Implicitly, the nutrition intake from food is higher when children eat more.

A child's latest education has a significant effect, but the impact can be regarded as meaningless. The government imposes more school hours to higher educational levels, making the students attend school more frequently as they move to a higher educational level.

The result shows that gender has no significance on school attendance. An argument for this remains the same as IFLS 4th wave analysis, where the disparity between male and female's diligence is usually showed in later stages of life, like high school.

The parent's educational level also contributes positively to child's school attendance. The argument remains the same as IFLS 4th wave analysis.

Children who live in urban areas are more frequent to attend school than those who live in rural areas. The heart of this problem may lie in the infrastructure.

Table 2. Marginal Effect of Regression (IFLS 4th Wave)

| VARIABLES | (1) att2 mfx dydx |
|-----------------|-------------------------|
| | |
| age | 0.315*** |
| | (0.0184) |
| agesq | -0.0118*** |
| | (0.000904) |
| c_primary | -0.00350 |
| | (0.0140) |
| c_junior school | 0.0275* |
| | (0.0159) |
| c_high school | 0.0857 |
| | (0.0720) |
| male | -0.0249*** |
| | (0.00839) |
| foodfreq | -0.0242*** |
| | (0.00815) |
| p_noschool | -0.115*** |
| | (0.0234) |
| p_primary | -0.0414** |
| | (0.0207) |
| p_junior school | 0.0846*** |
| | (0.0231) |

| | |
|---------------|-------------------------|
| p_highschool | 0.125*** (0.0231) |
| p_university | 0.189*** (0.0278) |
| urban | 0.0278*** (0.00899) |
| pkh_treatment | 0.0623*** (0.0137) |
| pkh_control | -0.0650*** (0.00909) |
| Observations | 15,370 |

The regression result based on IFLS 4th wave can be interpreted as follows:

- The older a child gets, the higher the probability to attend school more than 25 hours per week, but eventually the chance will decrease, *ceteris paribus*. (Significance level 1%)
- If person A is a primary school student and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.00350 percentage points. (Significance level 1%)
- If person A is a junior school student and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0275 percentage points. (Significance level 10%)
- If person A is a male and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.0249 percentage points. (Significance level 1%)
- The more frequent a child eat per day, the lower the chance of a child to attend school more than 25 hours per week by 0.0242 percentage points, *ceteris paribus*. (Significance level 1%)
- If person A is a child whose parent does not attend school and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.115 percentage points. (Significance level 1%)
- If person A is a child whose parent is a primary school graduate and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.0414 percentage points. (Significance level 1%)
- If person A is a child whose parent is a junior school graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0846 percentage points. (Significance level 1%)
- If person A is a child whose parent is a high school graduate and B is not, the probability of A to attend school more than 25 hours per week is

higher than B by 0.125 percentage points. (Significance level 1%)

- If person A is a child whose parent is a university graduate and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.189 percentage points. (Significance level 1%)
- If person A is a child who lives in an urban area and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0278 percentage points. (Significance level 1%)
- If person A is a child who receives PKH aid and B is not, the probability of A to attend school more than 25 hours per week is higher than B by 0.0623 percentage points. (Significance level 1%)
- If person A is a child who does not receive PKH aid and B is not, the probability of A to attend school more than 25 hours per week is lower than B by 0.0650 percentage points. (Significance level 1%)

From the interpretations above, we can infer that in IFLS 4th wave, children who receive PKH aid are more likely to attend school more than 25 hours a week than those who do not receive the aid. This can be marked as the initial success of PKH program. The aid's distribution can be concluded as effective.

Children who eat more in a day are less likely to attend school. The result is upside down from the hypothesis, simply because meal frequency is not the perfect proxy for nutrition level. Meal frequency only measures quantity, not quality of food eaten. Therefore, the regression analysis may differ from the hypothesis.

A child's latest education has a significant effect, but the impact can be regarded as meaningless. The government imposes more school hours to higher educational levels, making the students attend school more frequently as they move to a higher educational level.

The result shows that gender has no significant effect on school attendance. This can be caused by the characteristics of the observed. This study mainly includes those whose highest educational levels are primary school and junior high school. The disparity between male and female's diligence is usually showed in later stages of life, like high school.

The parent's educational level also contributes positively to child's school attendance. The connection

can be made through two ways: 1) a parent who can afford a higher education might have more ability to pay for their child's education, 2) a parent who attends a higher education might encourage their child to attend school more frequently.

Children who live in urban areas are more frequent to attend school than those who live in rural areas. The heart of this problem may lie in the infrastructure. In rural areas, the roads are not so well-built, creating obstacles for students to reach their schools. In addition to this problem, schools in rural areas mainly focus on primary education. Therefore, if the area does not have a higher education institution, the children who live there may not attend to a higher education, which has more school hours per week.

III. CONCLUSION

It can be concluded that PKH has different effects in 2007 and 2014. In 2007, PKH program raises the school attendance among its beneficiaries. This can be marked as an effectiveness of the program. Since the program was launched in early 2007, it makes sense that the initial objectives of the program remain true to its realizations. The PKH program also increases child's nutritional level (measured by meal frequency in a day), therefore raising children's school attendance

However, in 2014, the effect of PKH was indifferent among its beneficiaries and non-beneficiaries. From the literature reviews, it can be concluded that the problem lies in monitoring and evaluating.

PKH remains as a good solution for Indonesia's educational problems. In most cases, it can increase school attendance, therefore improves the quality of Indonesia's human capital. Further assessment is needed as a monitoring effort. The monitoring can be done by the government to ensure equality of the program, or can

be done by a third party to ensure further progress and quality achievements. The authors' recommendation is to hire a third party, since a third party can be more objective in evaluating.

REFERENCES

- [1] Al-samarrai, S., & Reilly, B. (2000). Urban and Rural Differences in Primary School Attendance : an Empirical Study for Tanzania Institute of Development Studies and a School of Social Sciences , University of Sussex. Education, 1995, 430–474.
- [2] Astone, N., & McLanahan, S. (1991). Family structure, parental practices and high school completion. American Sociological Review. Retrieved from <http://www.jstor.org/stable/2096106>
- [3] Attanasio, O., Vera-hernández, M., Battistin, E., Fitzsimons, E., & Mesnard, A. (2005). How Effective Are Conditional Cash Transfers ? Evidence From Colombia. Fiscal Studies, (54), 1–10. Retrieved from <http://www.ifs.org.uk/publications/3214>
- [4] Emerson, P. M., & Souza, A. P. (2008). Birth Order, Child Labor, and School Attendance in Brazil. *World Development*, 36(9), 1647–1664. <https://doi.org/10.1016/j.worlddev.2007.09.004>
- [5] Emerson, P. M., Souza, A. P., & Emerson, P. M. (2002). Bargaining over Sons and Daughters : Child Labor , School Attendance and Intra-household Gender Bias in Brazil, (2).
- [6] Jati, W. (2016). Bonus Demografi Sebagai Mesin Pertumbuhan Ekonomi: Jendela Peluang Atau Jendela Bencana Di Indonesia? *Jurnal Populasi*.
- [7] Pitt, M., Rosenzweig, M., & Gibbons, D. ~M. (1993). The determinants and consequences of the placement of govenment programs in Indonesia. *World Bank Economic Review*, 7(3), 319–348.

Implementation of Persuasif Strategy for Public Services in Private Enterprise

¹ Rachmawati Novaria, ² Achmad Sjafi'I ³ Indah Murti, ⁴ Ni Made Ida Pratiwi

^{1, 2, 3, 4} Lecturer at Faculty Social Science and Political Science

University of 17 Agustus 1945 Surabaya- East Java, Indonesia

E-mail: ¹ untag.nova@gmail.com, ³ indahmurti@untag-sby.ac.id, ⁴ idapратиwi@untag-sby.ac.id

ABSTRACT

Today, telecommunications plays a very important and strategic role in our daily lives. Through advanced communication technology and fast unhindered distance that stretches to make the telecommunications network widely offered with a variety of complete facilities and fast access capability, this is the main attraction for people to use information technology. One of them is PT TELKOM INDONESIA is a full service provider and telecommunication network in Indonesia, especially Indihome service products. Planning and strategy is made by Corporate Public Relation (CPR) which will influence the formation of imaging and good reputation for the company. The problem is the existence of negative issues that hinder the success of Corporate Public Relation implement a strategy designed and offered to provide services to the community is good. The research method used is qualitative descriptive by using case study approach. The result of the research shows that Corporate Public Relations PT TELKOM uses a persuasive strategy in providing services to the community that is to conduct communication strategy with four stages, first identifying by listening to the public's complaint, secondly; Conducting a community complaint subscription process; third; Conduct product knowledge socialization activities, fourth; Maximize human resources to serve the community and open events.

Keywords: persuasif strategy, public service

I. INTRODUCTION

Telecommunication currently plays an important and strategic role in our daily lives. Melalui communications technology community can exchange information quickly without impeded distance. This makes the telecommunication network with lengkap facility and fast access capability to be the main attraction for the community.

Our country has addressed the phenomenon through the development of an increasingly widespread telecommunications network is accompanied by diverse facilities. PT Telkom is a company that organizes information and information technology as well as service providers and telecommunication network. Berstatus as the only State-Owned Enterprise (SOE) in the field of telecommunication companies in Indonesia, launched a new service product, namely Indonesia Digital Home or more commonly referred to as Indihome, in the form of communication and data services package, such as voice, internet (Internet on Fiber or High Speed Internet), interactive television service (Usee TV Cable, IP TV) which is a complete package offered by PT Telkom.

In early 2016 the positive image and enthusiasm of new customers was tarnished by the existence of some negative issues regarding Indihome's service products, especially in the mass media. Reviews highlighting poor Indihome service products both in terms of the quality of the product itself and customer service had become viral for some time. Where customers feel aggrieved over the quality of the internet that he got does not match the product description information offered. A negative image results in a loss to the company. The process of accumulation of messages provided by customers and non customers is experiencing a fast and slow process to form a broader public opinion. The emergence of negative issues can certainly impact on the emergence of a crisis of trust from the community towards PT Telkom. A company experiencing a crisis of confidence from the public will have a negative impact on its image. It is able to make a company experience image degradation to the lowest point. Through public relations communication, it can certainly be avoided.

Speaking of resources, PT Telkom utilizes the performance of Corporate Public Relation (CPR). CPR has a very crucial role and position in the shaded company, which creates relationships both internally and externally. CPR must also be responsive in observing,

studying and resolving a problem, both internal and external companies considered to disturb the image of the company itself.

II. METHOD

The type of research used is to use qualitative research methods to understand the meaning behind the visible data. Social phenomena are often incomprehensible based on what people say and do. Every speech and action people often have a certain meaning. Qualitative methods can be used to understand complex social interactions and can only be used to understand social interaction through in-depth interviews and a clear pattern of relationship patterns can be found. The approach used in this study is a case study, which is a comprehensive description and explanation of various aspects of a person, an individual, a group, an organization and a program and a social situation. Research is done on natural objects that develop as they are, not manipulated by researchers and the presence of researchers does not affect the dynamics of the object. The subject of this research is the informant ie Staff Coorporate Public Relations PT Telkom Indonesia who served in Surabaya headquarters.

III. RESULT

Business PT Telkom Indonesia is a business that always change very quickly along with the development of technology in telecommunication and information of PT Telkom Indonesia. Where to fast in responding to the situation in order to become a competitive company not only in the country but a global company. To achieve the objective, the company conducts business activities which include: 1. The main undertaking is to plan, build, provide, develop, operate, market or sell, lease and maintain telecommunication and informatics networks in the widest sense by observing the provisions of legislation. 2. A side business is to provide services of payment and remittance transactions through telecommunications and informatics networks. Carry out other business activities in order to optimize the resources owned by the company, among others the utilization of fixed assets and movable assets, information system facilities, education and training facilities, maintenance and repair.

Interview with Sekdiv & Public Relation Manager of PT Telkom Indonesia: CPR identified a negative issue regarding indihome service products. As found in the following: Basically, the product service in Telkom that there are many, not just Indihome alone, so sometimes the PR side pay less attention to news spread and disadvantage PT Telkom, can be said to reduce the positid image of Telkom when the issue becomes viral

moment. The problem for each customer is different, there is only a broken five-minute network or even the cord that has not been turned on, the number of reports that give complaints about the indihome beyond the reasonable limit therefore PT Telkom always trying to put the consumer forward. Strategies used to solve problems by taking quick and effective solutions with persuasive strategies.

IV. DISCUSSION

The reality of the activity or the real desire of nature tourism is the attraction of recreational activities that utilize the potential of natural resources whose purpose is for tourists to receive physical and spiritual freshness, knowledge and experience and foster inspiration and love for nature. In conducting nature tourism activities we must preserve an unspoiled area, provide economic benefits and maintain the cultural integrity of local communities. It is another aspect that must be considered and prioritized to run, both by managers and tourists. In the economic aspect, for example, every natural tourism destination should have transportation and lodging facilities.

Specifically, Fadeli (2000: 34) mentions several criteria that must be implemented in the development of nature tourism, namely (a) managers must be responsible for the preservation of unspoiled areas, (b) provide economic benefits, and (c) maintain cultural integrity local community.

Gardner (1996: 65) asserted that a model of tourism development has the following conditions. First, logical, that is a form of tourism must be understandable and in accordance with the prevailing reality. Second, flexible, that is a form of tourism must be able to follow the development and needs. Third, objectively that a form of tourism should be based on goals and objectives based on systematic and scientific considerations. Furthermore, Gardner (1996: 69) also adds that the orientation of tourism development model has strategic importance that is; A) trend oriented, (based on existing tendencies) that is a development based on existing and developing considerations and order, b) oriented target, (based on target consideration) that is an outcome corresponding to the intended goals and objectives Achieved in the future as a determinant.

COMMUNICATION PERSUASIF

Persuasion is an attempt to change attitudes through the use of messages, focusing primarily on the characteristics of communicators and listeners. So the more persuasive communication is the communication

that seeks to change the receiver's attitude through the use of the message the sender does. De Vito explains the persuasive communication in the book *Communication of the Humanity* as follows: Persuasive talks present a conversation that is reinforcing, illustrating, and providing information to audiences. But the ultimate goal is to strengthen or change attitudes and behaviors, so the use of motivational facts, opinions, and appeals must be reinforcing its persuasive purpose. From the explanation, De Vito suggests there are two kinds of goals or actions that we want to achieve in conducting persuasive talks. The goal may be to change the attitude or behavior of the receiver or to motivate the receiver's behavior.

In order to change attitudes, behaviors, and opinions of persuasion goals, a persuader should consider the following factors:

1) Clarity of purpose

The purpose of persuasive communication is to change attitudes, opinions, or behaviors. If aims to change attitudes then relate to the affective aspect, change the opinion then related to the cognitive aspect, while changing the behavior then related to motor aspects.

2) Think carefully about the person faced

The goal of persuasion has a fairly complex diversity. The diversity can be seen from demographic characteristics, gender, job level, ethnicity, to lifestyle. Thus, before persuasive communication should persuasive learn and trace aspects of diversity of persuasion targets first.

3) Choosing the right communication strategy

Persuasive communication strategy is a combination of persuasive communication planning with communication management. Things to note such as who the goal of persuasion, where and when the implementation of persuasion communication, what to say, to why should be submitted.

THE BASIS OF COMMUNICATION CONCEPT

In persuasion, our attention can be focused on changing or strengthening attitudes or beliefs of persuasion goals, or in attempts to get them to act in a certain way. From the explanation, there are three concepts that we need to describe that is:

1) Attitude

Attitude is a tendency to behave in a certain way. Through persuasive communication, a receiver can change attitudes due to exposure to information from the sender. According to Martin Fishbein, attitude is a tendency to react pleasant, unpleasant, or neutral to an

object or a collection of objects. The goals of attitude change include the basic aspects of human attitudes: affective aspects (likes or feelings of an object), cognitive (beliefs about an object), and motor / behavior (action to objects) with the following description:

A. Target of cognitive aspect in persuasive communication

In this process, messages relating to the object of attitude are conveyed to the individual, in order that he is willing to approve the ideas contained in the message. Cognitive processes run during a persuasive process occurs, until finally the individual decided to agree or disagree with the object of attitude.

B. Target affective aspects of persuasive communication

In this section the affective or emotional process that will be the subject matter. When a persuasion message is delivered, the message will touch and affect the emotional aspects of the individual being targeted for persuasion. Pavlov in the principle of classical or respondent conditioning suggests that a person will behave positively toward an object that is often presented along with a positive stimulus, and vice versa, one will behave negatively to the object presented in conjunction with a negative stimulus. The principle relates to one's affective process when receiving a message.

C. Target motor aspect / behavior in persuasive communication.

The tension of dissonance motivates us to change, either our behavior or our beliefs, in an effort to avoid feeling depressed. The more important issues (message) for us and the greater the difference between our behavior and beliefs, the higher the dissonance we will feel. Changes in attitude can occur because of a person's desire to eliminate the state of incompatibility / discomfort. :

2.) Trust

Trust is a sense of certain things or the truth of things. Trust arises from the mixing of experience observation, second party evidence, as well as complex motivations. Martin Fishbein says that belief is the hypothesis that an object exists and that the relationship occurs between objects with the consideration of other objects. So according to the definition, there are two beliefs that are beliefs to objects and beliefs about objects. Belief in

objects like Fulan is injured. The beliefs about objects such as the injury suffered by Fulan will not last long.

3) Behavior

Behavior in persuasion refers to a clear or observable action. Behavior is an act of our attitude toward something. Such a waste-taking behavior in its place is one of the visible acts of a person who has a conscious attitude to cleanliness.

Humans basically tend to cluster. Man can not live individually. He always needs the presence of others.

PRINCIPLES OF COMMUNICATION PERSUASIF

Principles can be used as a basis for success in changing attitudes, beliefs, and persuading persuasion goals to do something. De Vito explains the principle is as follows:

1) Principles of Selective Exposure

This principle explains that: (1) listeners will actively seek information that supports their opinions, values, decisions, behaviors, and motivations (2) listeners will actively avoid information that is contrary to their opinions, values, decisions, behaviors and motivations . When the process of persuading the goal of persuasion will take place, then selective exposure will occur.

2) Principles of Participation Audience

The audience intended here is the goal of persuasion. Persuasive communication will be more effective if the audience participates in the communication process. Persuasion is transactional in which speakers and listeners are involved. Persuasion can be said to succeed if the audience participates actively.

3) Inoculation Principles

This principle speaks of confronting the target of persintated persuasion - a goal that already knows the position of the squad and has prepared a weapon of argument against it (persuader). So a persuader needs preparation like some argument in the communication to be done.

4) The principle of the magnitude of change

This principle says that the greater and more important the changes the persuader wants, the greater the challenge and the task of achieving the goal of persuasion. Thus, persuasion is directed to make small or gradual changes first and is necessary for a long period of time.

THEORIES - COMMUNICATIONAL EFFECTS OF COMMUNICATION EFFECTS

1. The Bullet Theory or Bullet Theory

It is the first conception to emerge, with regard to persuasive communication effects. It is also called

hypodermic - needle theory or hypodermic needle theory. Sometimes it is also called transmission belt theory or transmission line theory. In this theory is discussed about the influence of messages channeled through the mass media, and said that the mass media is powerful to change the behavior of the masses.

2. The Limited - Effects Model

According to a limited influence model, mass communication has little effect on its audiences. This is evidenced through Hovland's research on soldiers. The results show that film effects can only transmit information, rather than changing audience attitudes, as well as Azarsfeld's research on elections, suggesting that TV campaigns have little effect on target audiences.

3. Cultivation Theory

Gebner and his friends developed this theory by arguing that television has become a central cultural hand in the US he argues that TV has become part of the most important family members who always fill most of the time.

4. The Effects of Synthetic Experience

This theory begins with the results of the study of Funkhouser and Shaw, 1990. They say that moving images, television, and computers can form audiences' perception of reality, which can manipulate and re-plan, not just content, but also the process of communicating experience. The conclusion is that the electronic media displays a kind of artificial experience. The experience of imitation is whether in terms of color, about deviant things, and others have degraded human dignity in terms of looking at the culture (Severin and Tankard 1992)

5. The Spiral of Silence

Developed by Elizabeth Noelle Neumann they argue that mass media has a powerful effect in public opinion, because it is a source for a person in obtaining information.

The silence spiral generated by the mass media can be achieved through such things as the audience forming the message of opinion.

A. Dominant

B. Increased

C. Can be issued someone in public without making it isolated

6. Hegemony Media

According to this theory the ideas of the ruling classes in a society are the ideas prevailing within the society itself. According to this theory the mass media is a controlling tool by the dominant class in a society, and in view of as a helper in using the control of that class on the whole society. (Sallach, 1974)

7. Effects of Television Violence

The study and research on the effects of violence on the TV scene were set off by the social learning theories put forward by Bandura. Social learning theory argues that people tend to mimic the behavior they observe, stimuli being role models for behavior (Rahmad, 1968)

8. The Powerful Effects Model

Taken by Elizabet Noele Nouman 1973, this theory reinforces the earlier theory, the spiral of silence. This theory argues that the mass media can affect the behavior of audiences

The inhibiting factor in implementing persuasive strategy in PT Telkom in handling the negartificial issue of Indihome's service products in Surabaya, is inseparable from the obstacles in achieving the success of the objectives. As for the inhibiting factors are human resources, education and issues. While the supporting factors in implementing a persuasive strategy are: IT, cooperation, finance and product knowledge

PR strategy in the form of activities: socialization, cooperation, external activities.

Result of research: in conducting the research is as follows, in preparing CPR strategy need to be done planning process work program through four stages that begins by doing activity listening negative issue and looking for root of problem then make planning and make decision and communicate and do execution target its public Using a persuasive strategy

This method is most widely used to persuade (to persuade) people so unconsciously follow the wishes of communicators who convey persuasion. With the method of persuasion, a person or group of people does not feel that the change in him is due to outside influences. He believes that the urge to change his attitude, opinion or behavior has long been in him. This method will be discussed further because from the experiences of marketing experts and behavior change, persuasion is the most proven method of driving change and sustaining that change over the long term.

V. CONCLUSION

From research result PT Telkom handle its negative issue by way of persuasive communication strategy. Persuasive communication is a form of communication that mepengaruhi komunikannya so acting in accordance with what cool by the communicator may also be able to change attitudes of communicant, but the message to be communicated communicator to komunikannya should be a big thing to note because it will change the attitude and behavior

komunikannya. Things that can affect in persuasive communication are, communicators, messages, channels, recipients.

When CPR PT Telkom Indonesia execute its strategy in handling the negative issue about indihome service product in Indonesia there are some factors that hamper the human resources, education, Issue, while the supporting factor Issue and some factors that support CPR PT Telkom other are: PT Telkom has Indihome product To support CPR PT Telkom in suppressing negative issues such as IT, Cooperation, finance and product knowledge. In writing messages that are persuasive must be made to convince from parties related to the organization. Effective persuasive messages should be designed in such a way that, among other things, focus on the recipient, so that the message can fit the purpose. Writing persuasive messages is very important in business organizations, because every day the organization must send messages with a convincing tone, either to consumers, suppliers, business partners, or other parties associated with the organization., based on the strategy that has been chosen.

REFERENCES

- [1] Applebaum, RL., and Anatol, K.W.E. (1974). Strategies for Persuasive Communication. Ohio: A Bell & Howell, Co.
- [2] Deni Darmawan (2006) **Teori Komunikasi**, Bandung: Arum Mandiri Press
- [3] Depari E. Dan Andrews C.Mac. (1982). Peranan Komunikasi Massa dalam Pembangunan. Yogyakarta: Gadjah Mada University Press.
- [4] Larson, C.U. (1980). Persuasion, Reception and Responsibility. Belmont: Wadsworth Publishing Co.
- [5] M. Ghojali Bagus A.P., S.Psi. Buku Ajar Psikologi Komunikasi – Fakultas Psikologi Unair 2010
- [6] Onong Uchjana Effendy, Prof, M.A (2003) **Ilmu, Teori dan Filsafat Komunikasi**, Bandung
- [7] Siomon, H.W. (1976). Persuasion : Understanding, Practice, and Analysis. New York: Random House.
- [8] Simons, H.W. (1976). Persuasion: Understanding, Practice, and Analysis. New York: Random House.
- [9] Tubbs, S.L dan S.Moss (1996). Human Communication. Prinsip-prinsip dasar. (terjemahan: Dedy Mulyana). Bandung: Rosda.

The Meaningful Place: Transforming Taman Sari as City Park of Banda Aceh

¹ Rahmalia, ² Nurul Hikmah

¹ School of Journalism and Communication, Huazhong University of Science and Technology (HUST),
Wuhan City, P.R. China

² Boarding School of Fajar Harapan, Jln. Fajar Harapan, Ds. Ateuk Jawo, Kec. Baiturrahman,
Banda Aceh, Aceh, Indonesia 23245

E-mail: ¹ lia_04@ymail.com, ² nurlhkmah@yahoo.co.id

ABSTRACT

City Park is a public space which should be utilized optimally by the community. One of the city parks intersecting with the center of facilities and infrastructure of Banda Aceh city is Taman Sari. The condition of urban park in Banda Aceh city is not comfortable enough. Therefore, people tend not to use public space optimally, in this case, as a place for interacting, gathering, and holding the certain events. This research was intended to conduct a systematic observation on the utilization of Taman Sari (the city park) to maximize its function as public area and manage the efforts for the improvement of the area related to transformation of recreational area as the local playground into more meaningful, purposeful and useful site in term of social, economic, and environment sectors. The data obtained through field surveys, interviews and the study of literature as well as providing documentation about the activities of community by analyzing with the qualitative descriptive methods. The result showed that the city park which was also as representative public open area in Banda Aceh did not provide public facilities sufficiently. Whereas, public facilities were considered crucial to encourage people use the place purposely. Therefore, the existence of the city park would not only act as a playground but it could be more functional and beneficial in accordance with social and recreational activities, community creative art and entertainment, entrepreneurial activities as well as environment conservation. The Availability of public facilities would provide more attracting values to invite public to utilize the area as the centre for many activities. Briefly, this public area would serve community in conducting certain event or activities.

Keywords: The Meaningful Place, City Park, Taman Sari, Transforming, Banda Aceh

I. INTRODUCTION

City Park is a public space which should be utilized optimally by the community. One of the city parks intersecting with the center of facilities and infrastructure of Banda Aceh city is Taman Sari.

One of the public parks, Rahmad [21] and also the historical places, Nurdin [20] in Banda Aceh, Taman Sari is strategically located between some other important places. Masjid Raya Baiturrahman, one of the grand mosques in Banda Aceh is located 200 meters, Yudistira [33] on its southern side, while its Eastern side is located straightly in front of the Mayor of Banda Aceh Office and other government offices.

After tsunami disaster (Nurdin [20]) hit Aceh in 2004, Taman Sari was renovated. Some old facilities are replaced with the new ones due to lost affected by tsunami. Some new facilities are, park benches, kids games facilities, hot spot internet connection area, parking place, pedestrian, a place providing the water for public, gathering place, park

lighting, walking path, and food courts. Besides, the government also provides the toilet and praying place to make the people feel comfort.

Taman Sari is an open area used as public place to hold some events held by the government or non government in Banda Aceh, namely, Banda Aceh Expo, Product and Service for National travel and hand-crafting event, Exhibition, Culture and Art festivals.

The condition of this city park has fulfilled the standard as a city park (Yudistira [33]), but it's still lack of green and public area, Sari [24], Yudistira [33], Rahmad [21]. It is also lack of facilities needed to hold the big events, as well, Rahmad [21].

This paper is not only talking about the problems faced and looking for the ways to solve the problems, but it is also to talk about the history, the meaningful place, function and the transformation of

Taman Sari as well. Exploring how to use a place to be more important and meaningful, not only as a recreation place and waiting place, but also to be a place where the social interaction can be done and also as people's activities area.

A. Historical Background

Aceh (Thaib [29]; Crow [6]; Jemadu [13], Nurdin, [20]) is a province located on the tip of Northern Sumatera island (Ichwan [11]; Thaib [29]; McGregor [18] and also the last province in Western Indonesia (Jemadu [13]). Aceh is a province with special autonomy (Vignato [31]; Ichwan [11]; Sulistiyanto, [26] given by Indonesian Government, Sulistiyanto [26] with Banda Aceh as the capital city. Banda Aceh is a city which surrounded by the beaches from the Western Indonesia costal area. There are so many historical sites left by the previous Kingdom, Dhani, Husaini & Abdullah [7] in this place. There are so many struggling histories, Reid [22] to fight the colonial (Aspinall [1]; Crow [6]; Grayman, 2009; Jemadu [13]; Sulistiyanto, [26]) as well as releasing from the long conflict. Mc.Carthy [17]; Sulistiyanto [26]; Missbach [19]. The story about the cooperation with other kingdoms all over the world, Jemadu [13] the capital of the world trade, Aspinall [1] and Sufi [25], the story of sea traffic and a crowded transportation place by that time in Indian Ocean, until the story of being a destroying city by tsunami disaster.

A park which was described in the old manuscripts, Harun [9] the place where the Sultan's family was playing, Ichwan [11] is Taman Sari located in the middle of the city and one of the sites, Yudistira [33] and Rahmad [21] which was often visited by the people.

At the first time this park is only a playground for the Sultan's family, Ichwan [11] which was full of plants and flowers, and left empty until Aceh was free from Dutch colonial expansion, Kreike [15]. There was no building there at that time. In 1945 the freedom tower was built there for remembering that Banda Aceh was a capital area for Indonesia.

Being a strategic place, with a long landscape, which is close to any other tourism places like Tsunami Museum, *Peutjoet Kerkhof* (a mass grave which one of Dutch General, Kohler, and many other soldiers were buried), Blang Padang Field¹, Aceh's

Museum (Aceh's house), *Putroe Phang* park and also *Gunongan* Park, made Taman Sari become a really favorite place for family recreation, for discussion, for gathering, and also for the kids playground, as well as the relaxing place for waiting another member of family doing shopping in Aceh's Market (about 300 meters from the park) or getting meeting with someone in the offices placed across this park.

As it was told about the history in the past, this park is a proof about the development of Banda Aceh City from the Kingdom era to the modern government era.

a. Objectives of the study

This research was intended to conduct a systematic observation on the utilization of Taman Sari (the city park) to maximize its function as public area and manage the efforts for the improvement of the area related to transformation of recreational area as the local playground into more meaningful "Place", purposeful and useful site in term of social, economic, and environment sectors.

II. METHODS

a. Methods Design

The data obtained through field surveys, interviews and the study of literature as well as providing documentation about the activities of community by analyzing with the qualitative, Yin [32] and Creswell [4], descriptive methods.

Taman Sari the city park of Banda Aceh was chosen as a study site for this research, because it is one of the most strategic and accessible place (Lukermann, 1964; Relph [23]; Tuan [30], Creswell [4]) located in the middle of city density.

b. Overview Of The Research Site

The research was conducted in Taman Sari, the city park located in the one of most congested areas in the middle of Banda Aceh city, Aceh Province, associated with buildings, area of stores, offices, Masjid (Grand Mosque), Tsunami Museum, and other cultural sites.

The position of this city park is very potential because it is located only 200 meters (Ardee, 2017) in the southern side of Baiturrahman Mosque. The eastern side of the park is directly opposite the Mayor's Office of Banda Aceh and other office buildings.

¹ In the city of Banda Aceh, Indonesia, in recreational sports field, stands the 'Aceh thanks the world' memorial.

III. THE CONCEPT OF PLACE

Place is in more than just a location and can be described as a location, Lukerman in Relph [23] created by human experiences. In fact 'place' that is filled with meanings and objectives by human experiences (includes art, monument, architecture) in this particular space. Places are centers where people can satisfy, there biological needs such as food, water etc, Tuan [30].

The idea that place, to be a place, necessarily has meaning. Although there are glimmers of this idea throughout the history of geography, it grew in popularity in the modern discipline with the rise of humanistic geography, Tuan [30]. And a host of others approached place as a subjectively sensed and experienced phenomenon, Relph [23].

In each of these cases, the place is where the land is so very different from its surroundings that it deserves a name all its own. The museum is an attempt to produce a 'place of memory' will not be forgotten, Cresswell [4]. The gardens are the result of the efforts of others to carve out a place from a little piece of human for their community to enjoy nature. We give them special names and call them "places". A place can be labeled in several different ways. All of these are examples of the ongoing and diverse creation of places - sites of history and identity in the city.

IV. RESULT

Each city has its own history which becomes the starting point of the city's development. To this day, Taman Sari, which in the past was famous as the playground for the Sultan's family, is still continuing to transform and is trying to restore its landscape.

Visitors can experience the place, and enjoy the historical royal family atmosphere in this modern era. This place also serves a hotspot area where people can freely access the internet. There are also children's playground facilities, gathering place, and recreational facilities. Visitors can meet with friends or relatives. They also can do discussion, do exercise, or merely spend their leisure time. They can find it all in this green open space with modern nuances.

a. Taman Sari, the City Park

For a long time, this park has been an outdoor recreational place for the people of Banda Aceh especially, or for Acehnese in general. Especially, this

park had been a meeting point for some people, but so many changes have taken place after the Tsunami disaster hit Aceh in December 26, 2004 (Hestianti, 2006; Jauhola, 2010). After being rehabilitated and reconstructed, Taman Sari has changed in many aspects.

Before that, there were only minor changes happened in Taman Sari. That is as the researcher witnesses, since the researcher has been visiting the city park with family and friends for as long as the researcher can remember, and so the researcher has seen how it has changed for the last twenty years. However, basically Taman Sari has remained very much the same.

Even when the researcher is away from her hometown, the researcher can still remember the family atmosphere compelled by this place. This park is not very wide, it is only about 3000 meters square (Ardee, 2017), but this is supposed to be one of the reasons which eases people to interact with each other. Moreover, people can enjoy the city view, and it is also close to the mosque as well as to the market and the government offices. It makes people want to return to the park again.

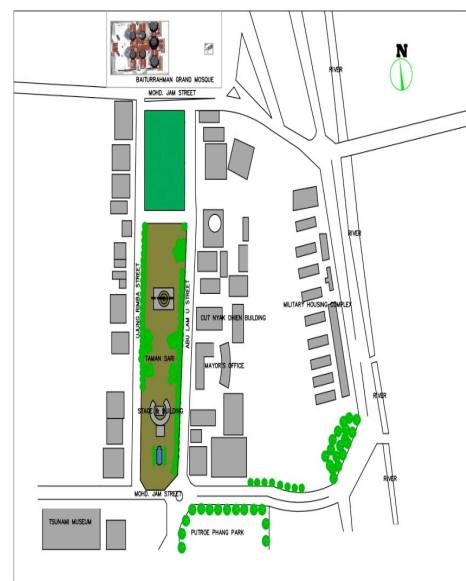


Figure 1. Taman Sari the city park

b. Transforming the Recreational Place into the Meaningful Place

The result showed that Taman Sari which was also as representative public open area in Banda Aceh did not provide public facilities sufficiently, Sari [24].

Whereas, the availability of public facilities is crucial to encourage people to visit a place. Therefore, the existence of the city park would not only act as a playground but it could be more functional and beneficial in accordance with social and recreational activities, community creative art and entertainment, entrepreneurial activities as well as environment conservation. The availability of public facilities would provide more attracting values to invite public to utilize the area as the centre for many activities. Briefly, this public area would serve community in conducting certain event or activities.

As one of the city icons, Taman Sari has begun to transform, becoming a more purposeful place rather than just a recreational place, Tate & Marcela [28] for the community. There are a lot of memories for the community who often make Taman Sari as a gathering place, Tate & Marcela [28], a meeting point, or only a place to relax, but still can see the activity of urban people on working days.

The availability of facilities and infrastructure in the city center raises the attraction for the community to do activities. The city park, Tate & Marcela [28] is a place where people engage in social interaction and social activities. When you walk in Taman Sari or gather in the playground, you are experiencing the outcome of that meaning, Swearingen [27].

Nevertheless, the change of function has not been followed by improvement of its quality as a city park, Rahmad [21]. In its efforts to increase the intensity of utilization, Taman Sari is already acting as a city park, functioning socially, ecologically and aesthetically, Yudistira [33], but it is still not maximal, its facilities as a green open space and public space is still lacking (Sari [24]; Rahmad [21]). As facilities to support major events are not yet supportive, it becomes less interesting to conduct events. The event organizers have to make a stand/use a nonpermanent building, then demolish it once the event is done. There is no permanent building that can facilitate the event held there.

To improve the quality of the city park, actions must be done through arrangement, good facilities, improvement of utilization, and socialization (publication). This is to increase visitors and utilization of the city park as a public space in Banda Aceh. The addition of multifunction shelter in the garden can be useful as a protective area of the sun or rain, and can also be used as a place of exhibition, and art performances (*piasan seni*).

It is necessary to take these actions for the creation of Taman Sari as a representative city park for a part of the public space of Banda Aceh.

c. The Meaningful Place

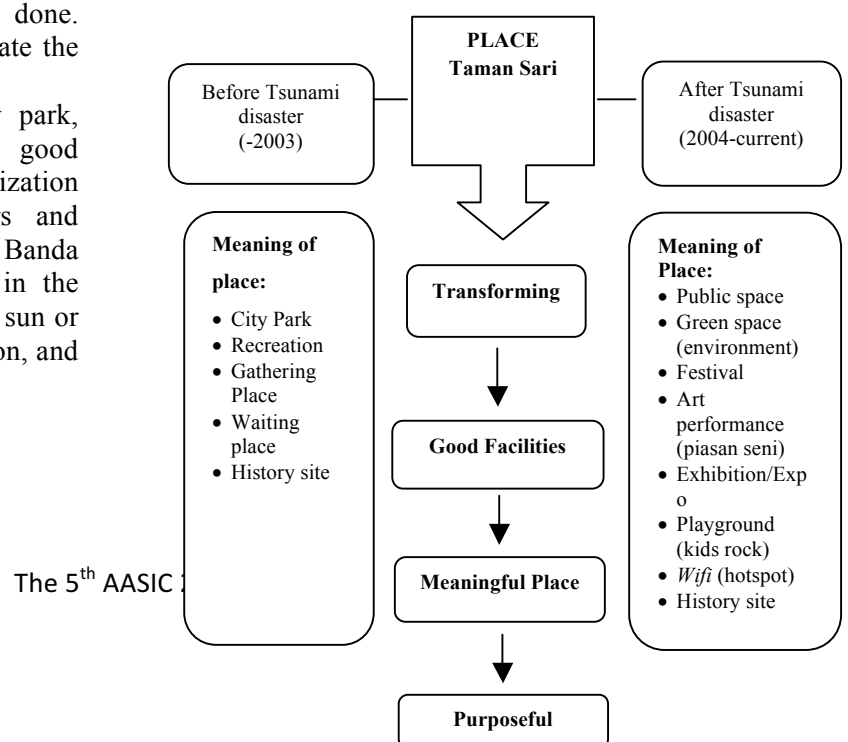
A good city park provides security and comfort for the community in performing activities. It should also link all creativity of children with the performances of various arts and performances of natural products or local products, and the interest of the urban area.

Good facilities will improve the image of Taman Sari as a city park, so it worths a visit. Furthermore, the urgent issue is how to improve the image of Banda Aceh through landmark (Taman Sari).

Since 2004, Taman Sari has transformed to become more beneficial to the community. The researcher does not consider Taman Sari as an ordinary city park, as time goes by, the researcher see Taman Sari as a meaningful place. Taman Sari has become an icon or a landmark, Lynch [16] of Banda Aceh, which is being developed after earthquake and tsunami.

Banda Aceh has been recognized nationally as the capital of the province. The city represents Acehese culture, its cultural diversity and religious diversity. It is a special place that represents Aceh today. Most people interpret meaning about a community by cultural values they see in a community.

It is to encourage the community to consider using the place for social interactions and other activities (or doing other programs). If a place can be defined as relational, historical and related to identity, then a space which cannot be defined as relational, historical, or concerned with identity will be a non-place, Auge [2].



managing the maintenance and supporting facilities in the park.

As a suggestion, to deepen the understanding, an interdisciplinary approach should be conducted to study the city park as a meaningful place.

ACKNOWLEDGMENT

I would like to thank to Prof. Yan Yuan who introduce me about Media Geography and especially the anonymous reviewers and the Committee.

REFERENCES

- [1] Aspinall, Edward. (2007). *From islamism to nationalism in Aceh, Indonesia. nations and nationalism*. 13 (2), 2007, 245–263. Journal compilation ASEN/Blackwell Publishing Ltd 2007.
- [2] Auge, Marc. (1995). *Non-places: introduction to an anthropology of supermodernity*. The Cromwell Press.
- [3] Chiesura, Anna. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning* 68, 129–138, Elsevier.
- [4] Creswell, John. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches* (2nd ed.). Thousand Oaks, London: SAGE Publication.
- [5] Cresswell, T. (2008). *Place: A short introduction*. London: Blackwell.
- [6] Crow, Karim D. (2000). *Aceh – The ‘Special Territory’ in North Sumatra: A self-Fulfilling Promise?* Journal of Muslim Minority Affairs, Vol. 20, No. 1. Carfax Publishing.
- [7] Dhani, Oga U., Husaini, & T. Abdullah. Peranan balai pelestarian cagar budaya (BPCB) Aceh dalam pelestarian situs-situs bersejarah di kota Banda Aceh Tahun 1990-2015 (*the role of the Institute for Preservation of Cultural Property (BPCB) Aceh in the preservation of historic sites in the city of Banda Aceh from 1990 to 2015*). *Jurnal Ilmiah Mahasiswa (JIM) Program Studi Pendidikan Sejarah Volume 2, Nomor 1, Januari 2017, hlm. 114-125*.
- [8] Falahat, Somaiyeh. (2014). *Re-imaging the city a new conceptualisation of the urban logic of the “Islamic City”*. Berlin, Germany: Springer.
- [9] Harun, Jelani. (2004). *Bustan al-salatin, ‘the garden of kings’: a universal history and adab work from seventeenth-century Aceh*. Indonesia

Figure 2. Transforming Taman Sari as City Park of Banda Aceh

d. Discussion

It analyzed some of the ways to improve the image of the city park so it will be more well-known, interesting to visit, and leaving a great impression. Thus, with good facilities and comfortable atmosphere, it will make visitors and the public remember Taman Sari as a meaningful place to visit. It will also become a valuable tourist destination worth to be publicized, and eventually will be an important landmark of Banda Aceh city.

This research provides interesting information to all parties, city-planners, visitors, reseachers, government, and the community, in order to create Taman Sari as a purposeful and meaningful place as the city park. Consequently, it will improve good image to outsiders about the role and importance of public green space for the citizens’ well being and quality of life.

People’s relationships and connections with their places have shown how a place can act as a gift. In the past and in the future, ancestors and descendants are inalienable presence to particular places. These may be nurtured, in the way we help to conserve the park and the homeland.

V. CONCLUSION

With the socialization of Taman Sari as a city park owned by the public, it is supposed to be an open space that is free to be used for any public activity. Provided that, the cleanliness and beauty of the city park should always be maintained. Consequently, the public knows that Taman Sari does not belong to certain parties, and is intended for the citizens instead. Although, of course the government is responsible for

- and the Malay World, Vol. 32, No. 92. Carfax Publishing.
- [10] Hestyanti, Yohana R. (2006). *Children survivors of the 2004 tsunami in Aceh, Indonesia. A Study of Resiliency*. Ann. N.Y. Acad. Sci. 1094: 303–307. New York Academy of Sciences, Doi: 10.1196/annals.1376.039.
- [11] Ichwan, Moch. Nur. (2011). Official ulema and the politics of re-islamization: *the majelis permusyawaratan ulama, shari'atization and contested authority in post-new order Aceh*. Journal of Islamic Studies 22:2, pp. 183–214. Oxford University Press on behalf of the Oxford Centre for Islamic Studies.
- [12] Jauhola, Marjaana. (2010). “When house becomes home”—Reading Normativity in Gender Equality Advocacy in Post-tsunami Aceh, Indonesia. Gender, Technology and Development, 14, 2: 173–195. Gender, Asian Institute of Technology, SAGE Publications.
- [13] Jemadu, Aleksius. (2004). *Searching for a more participatory approach to resolving the Aceh conflict*. Inter-Asia Cultural Studies, Volume 5, Number 3, 2004. Routledge.
- [14] Jesse Hession Grayman, Mary-Jo Delvecchio Good, Byron J. Good. (2009). *Conflict Nightmares and trauma in Aceh*. Cult Med Psychiatry, 33:290–312. Springer Science+Business Media, LLC 2009.
- [15] Kreike, Emmanuel. (2012). *Genocide in the kampongs? Dutch nineteenth century colonial warfare in Aceh, Sumatra*. Journal of Genocide Research, 14(3–4), September–November 2012, 297–315. Routledge.
- [16] Lynch, Kevin (2000). *The city image and its environment*. In: Richard T. Le Gates, *The City Reader*. (2nd ed.). London; New York: Routledge.
- [17] McCarthy, John F. (2007). The demonstration effect: *natural resources, ethnonationalism and the Aceh Conflict*. *Singapore Journal of Tropical Geography* 28, 314–333. Journal compilation © 2007 Department of Geography, National University of Singapore and Blackwell Publishing Asia Pty Ltd
- [18] McGregor, Andrew. (2010). *Geographies of religion and development: rebuilding sacred spaces in Aceh, Indonesia, after the tsunami*. Environment and Planning A, volume 42, p. 729–746. Pion Ltd and its Licensors.
- [19] Missbach, Antje. (2012). *Separatist conflict in Indonesia: The long-distance politics of the Acehnese diaspora*, Routledge, London and New York, xx + 260 pp. reviewed by Peter McCawley, *Indonesian Project*, Arndt-Corden Department of Economics, The Australian National University, Canberra, ACT 0200, Australia.
- [20] Nurdin, AR. (2012). The manuscript collections of the Aceh museum. Indonesia and the Malay World Vol. 40, No. 116 March 2012, pp. 94–110. ISSN 1363-9811/ISSN 1469-8382. Indonesia and the Malay World. <http://www.tandfonline.com/journals>. <http://dx.doi.org/10.1080/13639811.2011.649001>. This article is presented at the ASEASUK Annual Conference in Liverpool, 20–22 June 2008.
- [21] Rahmad. (2015). Peran taman sari sebagai pembentuk estetika kota Banda Aceh. Fakultas Teknik, Universitas Serambi Mekkah, Banda aceh. (Unpublish)
- [22] Reid, A., ed. (2006) *Verandah of violence: The background to the Aceh problem*. Singapore: Singapore University Press.
- [23] Relph, Edward. (2006). Place and placelessness, New York: Routledge.
- [24] Sari, Laina Hilma., & Aji Sofiana Putri. (2014). Efektifitas taman sari sebagai ruang terbuka publik di kota Banda Aceh. () RAUT-Jurnal Arsitektur Fakultas Teknik Unsyiah edisi II Vol. 1. ISSN: 2085-0905.
- [25] Sufi, Rusdi., Iriani Dewi Wanti., & Seno Djuniat. (1997) *Sejarah Kotamadya Banda Aceh*. Banda Aceh: Balai Kajian Sejarah dan Nilai Tradisional.
- [26] Sulistiyanto. Priyambudi. (2001). *Whither Aceh?* Third World Quarterly, Vol 22, No 3, pp 437–452. CA: Routledge. the Southeast Asian Studies Programme at the National University of Singapore, 3 Arts Link, 117570 Singapore.
- [27] Swearingen, William Scott, (2010). *Environmental city: people, place, politics, and the meaning of modern Austin*. (1st ed.). University of Texas Press.
- [28] Tate, Alan., & Marcela Eaton. (2015). *Great city park* (2nd ed.). London & New York: Routledge.
- [29] Thaib, Lukman. (2000). *Aceh's Case: possible solution to a festering conflict*. Journal of Muslim Minority Affairs, Vol. 20, No. 1. Carfax Publishing.

- [30] Tuan, Yi-Fu. (1977). *Space and place: The Perspective of Experience*. Minneapolis, University of Minnesota Press.
- [31] Vignato, Silvia. (2012). '*Men come in, men go out*': *Single muslim women in Malaysia and Aceh*. *Social Identities*. Vol. 18, No. 2. 239-257. Routledge.
- [32] Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage.
- [33] Yudistira, Hervia. (2015). *Evaluasi pemanfaatan taman kota*. Banda Aceh: Universitas Syiah Kuala. (unpublish).
- [34] Ardee/IndonesiaKaya. (2017). *Tamansari Banda Aceh, Alternatif Wisata Outdoor di Tengah Kota*.
<https://www.indonesiakaya.com/jelajah-indonesia/detail/tamansari-banda-aceh-alternatif-wisata-outdoor-di-tengah-kota>.
 Accessed on Desember, 15th 2016.

The Study of Speech Acts in Press Releases of International Technology Trade Fairs

Sasithorn Saelow

Business English Program, Faculty of Liberal Arts,
North Bangkok University
Pathum Thani, Thailand
E-mail: sasithorn.sa@northbkk.ac.th

ABSTRACT

The research aimed to study speech acts in press releases of international technology trade fairs. The conceptual framework of the study was Searle's speech act theory (1969), and the hypothesis was that five speech act classes – 1) representatives 2) commissives 3) directives 4) declarations and 5) expressives would be found in the press releases. For samples and data collection, 30 press releases of the international technology trade fairs during 2013-2017 from their websites, the channel provided for press and media to access news and information widely and easily, were collected because of being highly supported during this four years. For data analysis, speech act classes, paradigm cases – the sub-group of speech act classes, and directness of speech act were analyzed and discussed. The results showed that all five speech act classes were found in the contents, and this followed the researcher's hypothesis. Representatives were chosen most for the press releases in the highest level at 54.83% while directives and expressives were expressed least at the same level of 6.45%. However, although there are many paradigms in each speech act class, only a few ones were used in the contents. This might be due to the need in concise and relevant purposes and information in business field, and also time and page limitation for the news in press releases. The result reflected that information showing fact and true about the trade fairs were highly needed, and the irrelevant information were mostly discarded. Furthermore, direct speech act was needed for press releases to show the purposes and information of the fair, and it was showed in every speech act class. The findings also reflected the correlation between the business characters in conciseness and relevance and the speech acts in press releases that were clear and direct.

Keywords: speech act, press release, trade fair, international, technology

I. INTRODUCTION

Technology becomes a very significant sector for today's business world and an important factor to lead to the growth of world economy (The Global Information Technology Report, 2012). Over the past decade, technology is considered as a major business sector for most countries because it can be applied to other kinds of business sector such as agriculture, food and beverage, automobile and energy. Thus, technology is continuously developed for the highest efficiency, and there are a lot of technology and innovative products developed by many companies each year.

As there are plenty of technology products created and offered for consumers every year, the manufacturers and sellers in this sector will compete each other unavoidably, and then, they may count on business strategies, tactics and tools such as marketing, advertising and public relation to reach consumers and find the new customers for bigger market share (Ramon and Joan, 2010). These companies will find some ways or channels to show the efficiency of the products to consumers for their future product choices, and also seek for new markets for their future growth. Although there are many

ways for product promotion, only some ways are chosen, and trade fair is a selected one due to its useful characters of massive undertaking and enabling for showcase.

Trade fair, an exhibition for enterprises to showcase and demonstrate their latest products and services in specific industry to meet partners and customers, is an alternative for the companies to seek for business opportunities, especially international trade fairs where they can find their target customers from around the world (Seringhaus and Rosson, 2000). Trade fair has played an important role for a long time because it is counted as a place or channel for consumers to search for new products and for enterprises to find their target customers. Moreover, international trade fair is also a new coming business choice since it is a bridge for international trade between countries, and support import and export sector. Thus, international trade fair becomes a significant section for business opportunities of technology sector. For this reason, the publication of the fair is certainly important as it can help attract a large number of visitors. The suitable ways to publicize the information of the fair are certainly needed, and a way frequently chosen for this task is press release, the written materials provided for journalists, that helps boost and

promote the trade fair effectively because of real information shown for readers. Consequently, press release is considered as a major channel to convey significant information of the trade fair to publicity.

As mentioned above, the role of press releases toward international technology trade fairs seem obviously important, and most of them are published in English for international communication. Since both of non-native and native English speaking countries read the information of the fairs from English press releases, some misunderstandings in the purposes and information of the fairs from the language, which may not be their mother tongue, can occur. This issue, then, will lead to not many exhibitors and visitors to join the fairs due to lacking of clear understanding in the purposes and information. This can cause missing business opportunities and low returns of the exhibitors. For this reason, speech act, the study of the intentions of speakers through their utterances (Searle, 1969), is useful and helpful for this field. Since speech act focuses on the intentions shown directly or indirectly through utterances, it can help interpret the purposes and information of the fairs published on press releases. The clear understanding in their purposes or intentions can surely boost business opportunities of companies and perhaps business success in the future. Thus, the study of speech acts in press releases of international technology trade fairs is an interesting and challenge issue.

According to Searle's speech act theory (1976), speech act classes – 1) representatives 2) commissives 3) directives 4) declarations and 5) expressives were presented in this study. The researcher hypothesized that all of five classes would be found in the contents of the press releases after observing some of them for a while. Thus, the research aimed to analyze the speech acts used in the press releases by Searle's speech act theory, and the discussion in the speech act classes and directness to show their correlation was also provided. For the directness of speech act, both direct and indirect speech act were analyzed. Direct speech act would be indicated for the utterances that were directly in accordance with the intention of speaker, and when it followed the correlation between direct speech act and sentence types – statement with declarative sentence, question with interrogative sentence, and request and order with imperative sentence. Moreover, performative verbs, a sub-type of direct speech act which focuses on verbs that allow the direct convey of intent of speaker to utterance (Searle, 1979), were also analyzed to show the directness found in the content.

II. METHODOLOGY

A. Population and Sample

The population of this research were the press releases of international technology trade fairs, and the samples were the ones published during 2013-2017 because technology products have been highly supported and promoted during this four years. The selected press releases had to be published on the websites of the fairs because they were provided for press and media to access the information widely and easily. Thus, 30 press releases were chosen for this research.

B. Data Collection and Data Analysis

The data were collected from 30 press releases. Each sentence were separated from the text and analyzed with Searle's speech act theory. The followings were steps for data analysis.

1. Each sentence from the press releases was separated from the text, and divided into each of five speech act classes according to Searle's theory, mentioned earlier, to show the intentions appearing in the contents. Their paradigm case, the sub-group of the types of speech act, was also discussed, and the sentences were sub-grouped to each paradigm to clarify more specific purposes.

2. After categorized into five groups, direct and indirect speech acts of the utterances were analyzed to show language use.

3. Since there are two aspects to analyze direct speech act – 1) sentence types and 2) performative verbs, both of them were applied to search for the results. The use of these two aspects was shown in sample sentences, and performative verbs were indicated and explained, by using Macmillan English Dictionary 2nd Edition.

4. The frequency of the use in five speech act classes was calculated in percentage to show the overview of the intentions and the use of speech act in the whole contents.

III. RESULTS

The results showed that all of five types of speech act were found, and direct speech act were shown in all utterances. The followings were the analysis of data, and some samples were provided for clear picture.

A. Representatives

According to Searle (1969), representatives are to commit a speaker to the truth of an expressed proposition or something being the case. Paradigm cases including in representatives are asserting, stating, boasting, describing, and suggesting. For representatives, there was only stating found in the press releases, and only direct

speech act appeared in the contents. The followings were some examples of direct speech act in stating to show representatives.

Example:

(1) Forums, guided tours and lectures complement the presentations by the around 900 exhibitors expected to attend.

(2) The exhibits focus on the various steps for pulverizing, screening and processing sensitive materials and take account of associated processes like measurement and control technology and particle analysis.

(3) The high number of registrations underscores the importance of the event as the No. 1 platform for mechanical processing technology," emphasizes Beate Fischer, Exhibition Director POWTECH at NürnbergMesse.

(4) The sector plays a decisive role in shaping current industry trends and in September will once again showcase its latest developments.

The examples above showed that the sentence type went along with the speech act class. Stating will be direct speech act when it is declaration sentence, and this was proved in these examples.

B. *Commissives*

According to Searle (1969), commissives are defined as intentions that commit a speaker to some future action, or doing something in the future. Paradigm cases including in commissives are promising, pledging, threatening, offering, planning, vowing, betting, opposing.

For commissives, there were two paradigms found in the press releases – promising and offering, and only direct speech act appeared in the contents. The followings were some example of direct speech act in promising and offering to show commissives.

A) Promising

Promising, according to Macmillan English Dictionary 2nd Edition, is to tell someone that you will definitely do something.

Example:

(5) During the duration of the ReTEC, accompanying and parallel events will also bring other technical topics to Augsburg.

● Meaning of 'will': used for saying that you are willing to do something or that you intend to do it

(6) The registrations also promise a strong international presence and a large number of often impressive exhibits.

● Meaning of 'promise': to tell someone that you will definitely do something

The analysis in performative verbs was used in these examples since it could explain clearly on direct speech act. Verb 'will' and 'promise' acted as performative verbs to show doing something in the future. This indicated that the actions would cause some future actions. The use of 'will' was an interesting issue for discussion. 'Will', a kind of verb, to show promising happened in many press releases because the meaning of this word is to intend to do something. For directness, only direct speech act was found in the content, so there were not any implications occurring.

B) Offering

Offering, according to Macmillan English Dictionary 2nd Edition, is to let someone know that you will give them something if they want it.

Example:

(7) Two forums will offer ongoing presentations and workshops on issues affecting the industry.

(8) More than half of all exhibitors at POWTECH offer solutions for use in pharmaceutical manufacturing.

● Meaning of 'offer': to let someone know that you will give them something if they want it

The analysis in performative verbs was also used in these examples because it could explain clearly on direct speech act. Verb 'offer' acted as a performative verb to let someone know that something will be given if wanted. The examples above directly showed that there were some offers waiting for people who joined the fair. So, they were direct speech act.

As analyzed above, it could be concluded that only promising and offering were found in the commissive, and all of them were direct speech act.

C. *Directives*

Directives, according to Searle (1969), are defined as intentions that are used by a speaker attempting to get the addressee to carry out or perform an action. Paradigm cases including in directives are requesting, advising, commanding, challenging, daring, entreating, asking, ordering, inviting, and begging.

For directives, there was only inviting found in the press releases, and only direct speech act appeared in the

contents. Here was an example of direct speech act to show directives.

Example:

(9) Another highlight within the field of printing technology awaits visitors at the Pulse Electronics stand: The Finnish manufacturer will be demonstrating a device which can print antennas, sensors and much more onto three-dimensional objects.

- Meaning of 'await': to wait for something that you expect to happen

The examples above showed that the sentence type matched with the speech act class. Inviting will be direct speech act when it is declaration sentence, and this pattern occurred in the examples. Moreover, regarding to the meaning of 'await', it showed invitation to participants to visit the demonstration of printing technology.

D. Declarations

Declarations, according to Searle (1969), are defined as intentions that affect an immediate change of affairs. Paradigm cases including in declarations are declaring, baptizing, resigning, firing from employment, hiring, booking, arresting, and allowing.

For declarations, there were also two paradigms found in the press releases – booking and allowing, and only direct speech act occurred in the texts. The followings were some examples of direct speech act in booking and allowing to show declarations.

A) Booking

Booking, according to Macmillan English Dictionary 2nd Edition, is to buy tickets, or to arrange to have or use something at a particular time in the future

Example:

(10) At present, more than six months before the trade fair starts, a good 85 per cent of the display area total from 2016 has already been booked again.

- Meaning of 'book': to buy tickets, or to arrange to have or use something at a particular time in the future

Performative verbs were applied in this analysis as well for clear and further understanding on direct speech act. Verb 'book' showed as a performative verb to change the affair immediately to owning something after arranging it. So, the example was direct speech act.

B) Allowing

Allowing, according to Macmillan English Dictionary 2nd Edition, is to give someone permission to do or have something

Example:

(11) Our involvement with the ExpoDrev Russia fair allows us to offer our German and international customers from the primary and secondary wood processing technology sectors a well-established marketing platform for this region.

- Meaning of 'allow': to give someone permission to do or have something

(12) Draft legislation for this was recently submitted to the Standing Committee of the National People's Congress.

- Meaning of 'submit': to formally give something to someone so that they can make a decision about it

Performative verbs were also analyzed in these examples as they would explain clearly on direct speech act. Verb 'allow' and 'submit' showed as performative verbs to give someone permission that could change the affair immediately after authorization received. These examples were, thus, undoubtedly direct speech act.

C) Declaring

Declaring, according to Macmillan English Dictionary 2nd Edition, is to announce officially that something is true or happening.

Example:

(13) The prizes were awarded prior to interpack, and the winners are now set to compete with one other for the WorldStar Awards at the trade fair.

- Meaning of 'award': to give someone a prize or other reward because they have achieved something

The analysis in performative verbs was focused in this example for clear explanation in direct speech act.

Verb 'award' was a kind of declaration to show who deserved for the prize, and it could also change the affair from the normal people or place to winner. Consequently, these were direct speech act.

For the declaration, it could be summarized that booking, allowing and declaring clearly appeared in the content, and all of them were shown as direct speech act.

E. Expressives

Expressives, according to Searle (1969), are defined as intention to express some sort of psychological state. Paradigm cases including in expressives are greeting, thanking, apologising, complaining, congratulating, welcoming, and deploring.

For expressives, there were three paradigms occurring in the press releases – thanking, welcoming and pleasing, and only direct speech act was found in the contents. The followings were some examples of these paradigms to show expressives.

A) Thanking

Thanking, according to Macmillan English Dictionary 2nd Edition, is used for telling someone that you are grateful for something that they have said or done.

Example:

(14) Thanks to the partnership with KFEC, Deutsche Messe can now offer its international clients premium marketing platforms in two of Russia's most important forestry and wood processing regions.

The analysis in sentence types was used in the example because it would explain clearly on direct speech act. The example above showed that the sentence type went along with the speech act class. Thanking will be direct speech act when it is declaration sentence, and this was shown in this example.

B) Welcoming

Welcoming, according to Macmillan English Dictionary 2nd Edition, is to ask someone to come to see you or to spend time with you socially.

Example:

(15) We will welcome exhibitors from China and Iran for the first time.

- Meaning of 'welcome': to greet someone in a polite and friendly way when they have come to see you or to help you

The analysis in performative verbs was also explained in this example for deep understanding in direct speech act. Verb 'welcome' was a kind of expressives to show greeting on someone in a polite and friendly way when they have come to see you or to help you. As the performative verb was clearly shown, it was direct speech act.

C) Pleasing

Pleasing according to Macmillan English Dictionary 2nd Edition, is to make someone feel happy and satisfied.

Example:

(16) "EUROPOLTECH at AMBEREXPO will not only make the participants feel more comfortable at the trade fair and the conference but will also reduce organisation costs, which translates into decreased participation expenses.

- Meaning of 'feel': to experience a particular emotion or physical feeling

The analysis in performative verbs was also discussed in the sample sentence for clear understanding on direct speech act. According to the meaning of verb 'feel', it clearly related to feeling and emotion, and the example indicated comfort, a positive feeling, of the visitors to join the trade fair, so it was considered as direct speech act.

For the expressives, it could be concluded that thanking, welcoming and pleasing were expressed in the content, and all of them were direct speech act.

According to the results above, they showed that all of five speech act classes appeared in the press releases, and all of them were direct speech act. However, although there are many paradigms in each class, only a few ones were used in the contents. This might be due to the need in concise and relevant purposes and information of enterprises for efficient business decision, and also the time and page limitation for the news in press releases.

For further understanding in the overview of the intention and the use of speech act in the whole contents, the percentage of the frequency of the use in five speech act classes were calculated as shown in the table below.

TABLE I. THE FREQUENCY OF THE USE OF FIVE SPEECH ACT CLASSES

| Types of speech act | Amount (percentage) |
|---------------------|---------------------|
| Representatives | 54.83 |
| Commissives | 22.58 |
| Directives | 6.45 |
| Declarations | 9.67 |
| Expressives | 6.45 |

The results indicated that representatives were used most in the highest level at 54.83% while directives and expressives were expressed least at the same level of 6.45%. They reflected that the core information, stating fact and true, about the trade fairs were highly needed for business decision, and the irrelevant information were shown much less. Moreover, according to the results, direct speech act was extremely necessary for press releases, and it was showed in every speech act classes.

IV. CONCLUSION AND DISCUSSION

The research showed that all of five speech act classes, according to Searl's theory – 1) representatives 2) commissives 3) directives 4) declarations and 5) expressives, were found as in the researcher's hypothesis. Representatives were chosen most for the press releases

in the highest level at 54.83% while directives and expressives were expressed least at the same level of 6.45%. This reflected that the core information for fact and true about the trade fairs were highly demanded for business decision, and the irrelevant information were mostly discarded. In addition, direct speech act was extremely needed for press releases to show the purposes and information of the fair because, according to the results, it was shown in all speech act classes. The findings also reflected the correlation between the business characters in conciseness and relevance and the speech acts in press releases that were clear and direct.

ACKNOWLEDGMENT

I would like to express my sincere gratitude to my parents for their love, caring and sacrifices for educating and preparing for my future.

REFERENCES

- [1] C. Ramon, and E. R. Joan, "From Strategy to Business Models and onto Tactics," *Long Range Planning*, vol. 43, 2010, pp. 195–215.
- [2] F.H. Seringhaus, and R. Philip, "An Analysis Model for Performance Measurement of Inter-national Trade Fair Exhibitors," *Problems and Perspectives in Management*, vol. 4, 2004, pp. 152–165.
- [3] D. Soumitra, and B. Beñat, "The Global Information Technology Report 2012, World Economic Forum and INSEAD, Geneva: SRO-Kundig, 2012.
- [4] J. R. Searle, "Speech Acts: An Essay in the Philosophy of Language," Cambridge University Press, 1969.
- [5] J. R. Searle, "Expression and Meaning: Studies in the Theory of Speech Acts," Cambridge University Press, 1985.

Empowering Livelihood of Disabled People through *Batik* Village

Siham Madihah

Faculty of Economic and Business, Universitas Muhammadiyah Yogyakarta
Yogyakarta, Indonesia
diajengsiham@gmail.com

ABSTRACT

This study attempted to understand the problem faced by disabled people who live in Rejdani Village, which is located in the southwestern part of Special Region of Yogyakarta, Indonesia, as a means to empower them through the establishment of *Batik* Village. This study was conducted in the form of qualitative descriptive through the use of observation, indepth interview, and documentation technique as the instruments of data collection. Disabled people still had to encounter the social, economic, psychology, culture, education, and accessibility problems. Rejdani Village of *Batik* is suggested as a strategy to empower disabled people through character building, entrepreneurship, socialization, education, participation, and economic enterprise. The disabled people are required to innovate their production of *batik* as the portrait of archipelago and bring history of Islam in the world behind their *Batik*'s motives. This study found that disabled group who actively participate in all Rejdani Village of *Batik* grew independently and financially survive without the help of their family members or others.

Keywords: Disabilities, Empowerment, Qualitative, Development

I. INTRODUCTION

The international community has admitted *Batik* as Indonesian cultural heritage on 28 September 2009. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) stated that *batik* is one of the original cultural heritages of Indonesia [1]. Hence, *Batik* is not only the creative artwork which developed all the time, yet it becomes the source of income to many industries.

Yogyakarta is one of many regions which develop *batik* craft and art. Realizing that *batik*, silver and puppet as the worth national asset, government support the local business to preserve *batik*. Yogyakarta as the center of classical Javanese art and culture use *batik* as the main business product that sold either to local or foreigner buyers. Other important products of this city are handicrafts included *batik* garments and household items, wood products, leather, ceramics and pottery and silver. The typical patterns and motifs of Yogyakarta *Batik* are Parang, Ceplok, Sido-Mukti, Truntum and Kawung. The combination of Yogyakarta *batik* color is the same as Solo region, which predominantly by rich brown, indigo (blue), black, white and beige. One of *Batik* production areas in Yogyakarta is Rejdani Village, which is located in the southwestern part of Special Region of Yogyakarta.

In the current development, *batik* is potential to be well known in worldwide view level. *Batik* is considered to be one of unique characteristic since it has the historical meaning from its product. Rejdani Village, Indonesia will not only present the *batik* creation yet to deliver the historical message of the culture diversity and Islamic touch behind every product that they made.

These values are used as the main grip in developing motifs. Therefore, *batik* is expected to be a medium in order to convey the historical messages and local wisdom that became the identity of the Indonesian nation. On the other hand, every *batik* production processed from design, pattern, *batik*, coloring, suturing until finishing is always accompanied by *dhikr* (reciting the sentence that glorifying God). This habit is called "*Batik Berdzikir*".

Rejdani Village of *Batik* also has significant vision for the environment. It is manifested through the empowerment of the disabled. People with disabilities are large minority groups who struggle to gain control over their lives and claim their rights to control the factors that affect their lives. It may be difficult due to physical or psychological limitation. More often, however, this condition is influenced by the stigmatization and prejudice, and extrinsic factors such as institutions, organizations and communities that do not allow persons with disabilities to be responsible for their own lives. Therefore, increasing empowerment is very significant in the rehabilitation of people with disabilities, for example, by giving them the tools that they need to achieve independence and self-determination.

This study tried to understand the problems faced by people with disabilities who live in Rejdani village, specifically in the north part of Yogyakarta, Indonesia, as a means to empower them through the formation of *Batik* village. Furthermore, the significances of this research are expected to be an input in empowering workers with disabilities to improve the welfare of workers with disabilities through the formation of *Batik* village.

The structure of this paper is presented as follows: In part 2, we introduce the data and methods; In part 3, we discuss the results; and in the last section, we

summarize and discuss our findings and suggestions for the next research.

II. DATA AND METHODS

This paper use a qualitative descriptive study based on literature. Interview and observation is undertaken. In-depth interviews were conducted to the founder of Sogan batik in Rejodani and disabled workers who live in Rejodani Village. This village is a means to empower disabled through the establishment of *Batik* Village. This is done by collecting information by asking a number of questions orally for face to face relationship. The data used in this research are primary data and secondary data. Primary data is obtained through three ways: observation, interview to the community and triangulation (truth checking). The observation was done to understand the research location and to understand the characteristics of Rejodani Village. Interviews were conducted to get main informants and respondents to find out the management of Rejodani Village of *Batik*. Triangulation is done by comparing the information provided by the key informant and respondent to the conditions that occur directly in the community. Secondary data are obtained from various sources: books, official websites, journals and articles that have been identified, analyzed, clarified and interpreted, so that source this research is expected to strengthen and sharpen the research.

III. RESULTS AND ANALYSIS

a) Regional Overview and Potential Rejodani Village of *Batik*

Rejodani village include in the area of the village of north Sariharjo, Ngaglik, Sleman. It is divided into two main hamlets namely Rejodani I (in the north) and Rejodani II (in the south). Geographically, this village is still surrounded by rice fields in the north, south, and west, while in the east is limited by Boyong River which becomes the forerunner of Code River. Rejodani Village of *Batik* is located in Rejodani village, street Palagan Tentara Pelajar km 10 Sariharjo, Ngaglik, Sleman, Yogyakarta. The Location is approximately 5 km from Jogja Kembali Monument. The majority of the population living in Rejodani village is a Muslim society (embracing Islam almost entirely). This is reinforced by the environmental condition of the community that is decorated with a touch of Islam. According to the history, Rejodani village is not a batik village. Then in 2009 Taufiq Abdurrahman as the founder of CV. Sogan Jaya Abadi

trained some disabled to make batik. Until now, Sogan Batik still exist in producing and innovating to develop his work.

b) Problems in The Management of Rejodani Village of *Batik*

Rejodani Village, which is located in the north part of Special Region of Yogyakarta, Indonesia, empowers disabled through the establishment of *Batik* Village. The founder Rejodani Village of *Batik* realize that there are still many perceptions of the disabled as a meaningless person who has a very little involvement in economic activity. As a result, this makes them difficult to adjust and feel that there is discrimination against them. In fact, people with disabilities are part of a country that has the same rights, duties and roles. Respect for the fulfillment of the rights of persons with disabilities is increasingly concerned with the passage of Law No. 19 of 2013 on Legalization of the Convention on the Rights of Persons with Disabilities. Indonesia has ratified the convention which means having full responsibility and commitment to pursue the rights of persons with disabilities. On the other hand, the price of Rejodani Village of *Batik* products is high enough to be a challenge to market it. Before in 2009, the marketing of Rejodani Village of *Batik* products has not much demand. Therefore, it is necessary to create innovations in demand from a variety of market segments. Then, the location of this Rejodani Village of *Batik* is still not strategic. In the processing of batik, it is also still difficult to make an environmentally friendly production process because currently uses synthetic dyes.

In this research there are factors driving the development of Rejodani Village of *Batik* that is:

1. Product: design that narrates the message history of the archipelago and the Islamic world on every collection behind every Batik motif.
2. Price : competitive product price.
3. Place : The location is still beautiful with the design of Java buildings.
4. Promotion : so far the promotion is good enough
5. People : some diligent and creative disabled people.
6. Process: every batik production processed from design, pattern, batik, coloring, suturing to finish always accompanied by dhikr.

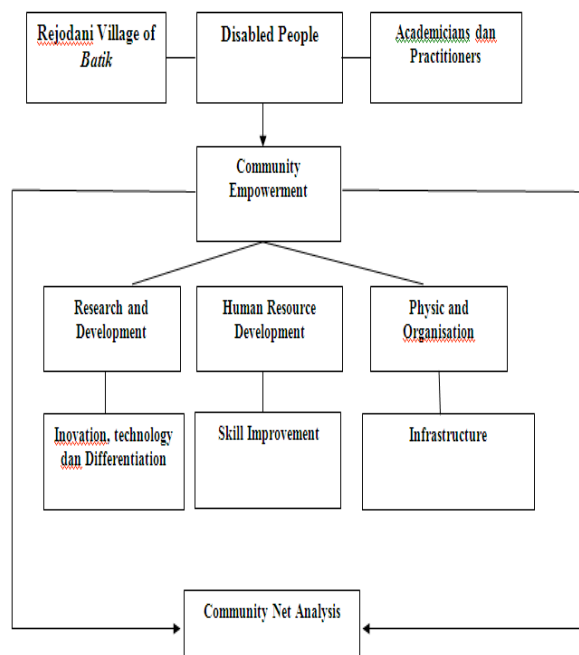
c) Livelihood of Disabled People through Rejodani Village of *Batik*

In contemporary world economic factors determine the quality of life, dignity and value of a person. The

World Health Organization (WHO, 2010) argues that safe access to livelihoods can reduce poverty among people with disabilities. 'Livelihood' not only refers to the ability to gain but also the opportunity to develop one's full potential by controlling for the factors that shape his life and contribute to the development of society [2]. A sustainable rural livelihood approach emphasizes access to resources; Market and economic services; Elimination of barriers to participation; Reforms in basic services and improvements to rural infrastructure to improve the livelihoods of all people, including people with disabilities [3].

Related to the statement, Rejodani Village of *Batik* provide opportunities for people with disabilities not only to get a chance to work. Most people with disabilities are placed in the production section, especially sewing and batik. However, they can also develop the potency and creativity in producing products derived from batik. Every process of batik production from design, pattern, batik, coloring, suturing to finish always accompanied by dhikr. In addition, they also perform dhuha prayer and recite al qur'an before work. It can increase faith and confidence and eliminate the feeling of discrimination as well.

Framework Empowering Livelihood of Disabled People through Rejodani Village of *Batik*



Description:

The concepts of empowering disabled people are implemented through 3E approaches:

- **Rejodani Village of *Batik***, the company that becomes the media of the disabled in work

- **Academics and Practitioners**, which runs Research and Development and Human Resource Development.

- **Disabled People** as an object of empowerment

- **Community Net Analysis** is to conduct a comprehensive analysis to determine the factors that affect the empowerment of disabled people.

The concepts of empowering disabled people are implemented through 3E approaches:

1. Education of disabled people . First, to educate about the potency of the disabled people and train in the form of sewing and batik skills. Second, the processing and production of the community are guided in order to enable to create innovative and creative products. Third, to improve religious and spiritual enhancement.
2. Environment is in the production of batik processing waste into an main environmental problem. The waste is derived from industrial and liquid residue settlement. The impacts that arise with the various pollution materials will destroy the ecosystem and harm the water content of the land in the village Rejodani. Thus, it is very necessary immediately recycle batik waste.
3. Entrepreneurs are educate disabled people to understand opportunities, to organize resources, to manage financial and do online marketing.

IV. CONCLUSION

Rejodani Village of *Batik* is suggested as a strategy to empower disabled people through character building, entrepreneurship, socialization, education, participation, and economic enterprise. The disabled people are required to innovate their production of *batik* as the portrait of archipelago and bring history of Islam in the world behind their Batik's motives. This study found that disabled group who actively participate in all Rejodani Village of *Batik* grew independently and financially survive without the help of their family members or others.

SUGGESTION

For Rejodani village of batik, it would be better to create handicraft innovation because so far the products resulted are still related fashion such as Moslem Ready to Wear; Blouse, Skirt, Long Dresses, Hijab, Abaya. As a result the skills of disabled people are will be improved.

For the next researcher, it is better to explore more about safety and live assurance protection of human resources, specifically disabled people.

REFERENCES

- [1] Herawati, Kristiani. *Batikku Pengabdian Cinta Tak Berkata*. Jakarta: PT Gramedia Pustaka Indah, 2010.
- [2] Coleridge, P. and Venkatesh, B., Community Approaches to Livelihood Development: Self-help Groups in India. In: T. Barron and J. M. Ncube, eds. 2010. *Poverty and Disability*. London: Leonard Cheshire Disability, 2010, pp.177-213.
- [3] Akroyd, S. and Duncan, A., The Sector Approach and Sustainable Rural Livelihoods: In: D. Carney, ed. 1998. *Sustainable Rural Livelihoods: What contribution can we make?*. London: Department of International Development, 1998, pp. 27-38.
- [4] Barron, T. and Amerena, P., Introduction. In: T. Barron and P. Amerena, eds. 2007. *Disability and Inclusive Development*. London: Leonard Cheshire International, 2007, pp.1-20.
- [5] Ellis, F., Livelihoods Diversification and Sustainable Rural Livelihoods. In: D. Carney, ed. 1998. *Sustainable Rural Livelihoods: what contribution we can make?*. London: DFID, 1998, pp. 53-65.
- [6] Harris-White, B., 1999. On to a loser: Disability in India. In: B. Harris-White and Subramanian, eds. 1999. *Essays on India's Social Sector in Honour of S. Guhan*. New Delhi: Sage Publications, [online].
- [7] International Labour Organisation, 2010. *The role of international cooperation in support of the Convention on the Rights of Persons with Disabilities, ILO Contribution* available http://www.ilo.org/wcmsp5/groups/public/---dgreports/---jur/documents/genericdocument/wcms_434545.pdf

***Rechtsvacuum* in the Capital Market Regulation in Indonesia, A Case: The Embezzlement of Customers Funds by PT. Sarijaya Permana Sekuritas.Tbk.**

Siti Hatikasari

Faculty of Law, University of Indonesia, Depok,
Master of Legal Studies Program, University of Indonesia, Salemba, Jakarta, Indonesia.
E-mail: sitihtikasari@gmail.com

ABSTRACT

The activities in the capital market have given an important influence on economic conditions in Indonesia. The capital market is one of the rapidly growing business areas. This resulted in the various crimes in the capital market which come up with diverse strategies. This happened in the case of embezzlement committed by the company in Indonesia. One of which is the embezzlement committed by directors and commissioners of Sarijaya Permana Sekuritas Company. The offense is not specifically regulated in The Act Number. 8 of 1995 about the Capital Market. This condition causes the confusion in the settlement of the case, that there is a *rechtsvacuum*. The author wants to analyse about how is the juridical analysis of *rechtsvacuum* in the embezzlement case of customers funds by Sarijaya Permana Sekuritas Company, and how is the law that should be used in the settlement of the case. This research is conducted with the study of documentation, namely collecting and researching of legal materials through a search of legal literatures by analyzing a legal decision from the court about the crime in the capital market, based on the Act and the related rules. In addition, the authors conclude that there is a *rechtsvacuum* in the case. In the consideration of the judgement, the judges stated that the defendant is proved guilty based on the judgement of the criminal case, but this case is a specific offence in the capital market and should be applied the Act of Capital Market. In Fact, In the Act of Capital Market has not the article about the embezzlement, with the result that in this case should be used the Criminal Code. Depending on these conditions, the regulations of capital market need to be revisited because there are some offenses are unregulated. Furthermore, the supervision by authority is important and needs to be tightened.

Keywords : *Rechtsvacuum*, Embezzlement, The Capital Market

I. INTRODUCTION

A. Background

In this era, Regulation in the Capital Market is important in the business area. Capital Market is where the owner with the user funds for direct investment and indirect investment, while the capital is traded is securities. The Capital Market can also be defined as a market that trades long-term financial instruments (securities), either in the debt form or self-capital issued by private companies.¹

Activities in the Capital Market must not be separated from the Capital Market Regulation. The scope of Capital Market law itself relates to the elements needed for the operation of the capital market, which consists of:

- 1). Regulation of capital market law;
- 2). Institutional arrangements in the capital market;
- 3). Arrangement of financial economic policies that support the implementation of capital markets; and

- 4). Enforcement of stimulant facilities to encourage the implementation of capital markets; and
- 5). Regulation of working mechanism of capital market operation.²

All these elements have been set in the regulations concerning the capital market, particularly regulated in the The Act Number 8 of 1995 about Capital Market. The birth of the Law is expected to solve the problems that arise in the capital market activities, and the capital market can contribute maximally in development in Indonesia, especially in the economic sector. However, in practice, lawyers and legal experts often find issues related to the capital market, including ways of dispute resolution and criminal offenses in the capital market that have not been clearly regulated in the current Capital Market law. For instances, the cases of embezzlement and nominee obligations. Capital market

¹ M.Irsan Nasarudin and Indra Surya, "*Aspek Hukum Pasar Modal Indonesia*", Prenada Media, Jakarta, 2004, at 13.

² Sumantoro, "*Aspek – Aspek Hukum dan Potensi Pasar Modal di Indonesia*", Ghalia Indonesia, Jakarta, 1990. at 175.

provisions have not regulated the obligation of nominee to convey information on who it represents.³

The various problems concerning the Capital Market are also caused by the lack of continuous supervision by authorities. Other problems can also occur due to lack of regulatory reform regarding capital market problems in Indonesia which to date is specifically still regulated in the Act Number 8 of 1995 about the Capital Market.

One example of cases related to the Capital Market is a case of misappropriation of customer funds by Company that occurred in Indonesia. In this case, PT. Sarijaya Permana Sekuritas Company, represented by the Directors and the Commissioners, has embezzled funds against its customers, causing a loss almost Rp 14 billion. The problem is the embezzlement has not been regulated in the Capital Market Law. Therefore, the Judge in the court applied the embezzlement article in the Criminal Code (KUHP) to the defendants.

Based on the case, there is a *recthvacuum* in the regulation of the criminal act of embezzlement in the field of capital market in Indonesia which is interesting to be analyzed. Therefore, the author in this journal will discuss and analyze the existence of *rechtsvacuum* in the case of embezzlement of customer funds by Sarijaya Permana Sekuritas Company based on the decision of the court and the prevailing laws.

B. The Questions

1. How is the juridical analysis of *rechtsvacuum* in the embezzlement case of customer funds by Sarijaya Permana Sekuritas Company ?
2. What kind of arrangements should be used related to the settlement of embezzlement case of customer funds by Sarijaya Permana Sekuritas Company?

C. The Methodology

This law research is normative and the method used is normative law research or literature law research, that is law research done by researching library materials or secondary data.⁴ This research is a law research with the object of law which is conceptualized as a rule of law that obeys the positivism doctrine in the rule of law⁵ and

³ Indra Surya, *Transaksi Benturan Kepentingan Di Pasar Modal Indonesia*, Lembaga Studi Hukum Dan Ekonomi, Jakarta. 2009, at 25.

⁴ Soerjono Soekanto dan Sri Mamudji. *Penelitian Hukum Normatif*. PT. Raja Grafindo Persada, Jakarta. 2012. at 13.

⁵ Sulistyowati Irianto dan Sidharta, *Metode Penelitian Hukum : Konstelasi dan Refleksi*. Yayasan Pustaka Obor Indonesia, Jakarta. 2011. at 124.

also with the object of law which is conceptualized as judge decision of law.⁶ In this legal research, the author uses the approach of legislation. This is an approach using legislation and regulation,⁷ which examines the issues discussed under relevant legislation. Then the author also discusses based on court decisions, legal theories and references related to the research undertaken. In addition, the author can get answers to the issues discussed in this study and understand the philosophy of why the importance of the legal foundation.

The material in this research is the primary material law and secondary material law. The primary legal materials used are The Act Number 8 in 1995 regarding The Capital Market, The Act Number 40 Of 2007 about Company, Criminal Law Code, The Act Number 21 of 2011 regarding Financial Services Authority, and Related Court Decisions as well as other relevant regulations. Then for secondary law materials that the authors use are theories in the law, textbooks literature and electronic books related to research, journals and thesis related to research.

The procedure used in this research is documentation study by collecting legal materials, obtained both off line and online from library of Graduate Faculty of Law University of Indonesia in Salemba and Library of University of Indonesia in Depok. Furthermore, the legal materials are reviewed and analyzed according to applicable law, then the legal substance is also identified, defined, analyzed and classified to become valid secondary data. In the next stage the authors do re-analysis so that the authors get answers from the issues raised.

II. DISCUSSION

A. Juridical Analysis of *Rechtsvacuum* in Cases of Fund embezzlement of Customers by PT. Sarijaya Permana Sekuritass

The case of PT. Sarijaya Permana Sekuritas is one of the interesting cases to be analyzed in terms of juridical. This case has caused much discussion from several academics, related to the law that will be applied in this case, including a different view by the Police and The Authorities. According to the Authorities, the case involving Director and Commissioner of the Company is included in the criminal law area and the Police who

⁶ Sulistyowati Irianto dan Sidharta, *Metode Penelitian Hukum : Konstelasi dan Refleksi*. Yayasan Pustaka Obor Indonesia, 2011). at 125.

⁷ Peter Mahmud Marzuki. *Penelitian Hukum*, edisi revisi Jakarta: Prenadamedia, Jakarta, 2005. at 137.

have the authority to conduct law enforcement process on the case. While from the Police opinion the case of The Company is a case in the capital market and the authorized party for the settlement is the authorities.

These different opinions make the case of The Company is resolved through two ways, through civil law and criminal law. In the Civil law are used by customers who feel disadvantaged. Customers sue the company as well as Director and Commissioner with the intention to restore the company's funds and replace the losses that have been suffered by customers, while the criminal lane conducted to prosecute the suspects are The Directors and The Commissioners of Company to be legally responsible.

Case of embezzlement of customer funds conducted by PT. Sarijaya Permana Sekuritas is an unlawful act which is an embezzlement which also involves several officials within the company. The case has reached the appellate court, which is in the Supreme Court with the case No.883.K/Pdt/2013 which has won the customers of company as the plaintiffs. The court gave the criminal penalty for the defendants who were found guilty of committing unlawful acts of embezzlement together.

It becomes interesting to be analyzed especially if seen from The Act Number 8 of 1995 concerning Capital Market. Based on the chronology of company commits an act against the law by collecting funds from customers to conduct sale and purchase on the stock exchange, but in the course of the defendant II (The President Commissioner), defendant III (The President Director), defendant IV (The Director) and defendant V (The Director) jointly deliberately conduct share transactions using accounts on behalf of the customers without permit from the customers, and The Company can not refund the property of its customers.⁸ The Authorities as an institution that has the authority to conduct guidance, regulation and supervision has suspected that there is a problem in the company, then The Authorities conduct an investigation. As a result The Authorities asked PT. Bursa Efek Indonesia to bankrupt all of activities undertaken by The Company.⁹ The Bankrupt was followed by the arrest of the defendants who were accused of embezzlement by the police. At this time the suspects have received a verdict from the court due to embezzlement to the customer's funds.

Based on the chronology it can be analyzed that the crime committed by the Director and Commissioner

is a crime in the capital market sector because the embezzlement is made to the customer's funds in the securities company and the use of the customer's funds for the stock transaction. Then, the case is worth to apply Capital Market Law to resolve The problem. The share transactions by the defendants in this case were made using the accounts of the plaintiffs without tell to the plaintiffs. However, in the capital market law, namely The Act Number 8 of 1995 concerning Capital Market has not been regulated on the crime of "embezzlement together". In addition, there is a legal vacuum (*rechtsvacuum*) in this case. This becomes an interesting study to be analyzed based on a verdict No.401/Pdt.G/2010/PN.JKT.Sel. Related to this case, customers of company have filed a lawsuit against The company relating to unlawful acts committed by the Defendants. This is because the Defendants have deliberately entered into share transactions using accounts on behalf of others without the consent and without permit of the customer account owners.

The lawsuit is not accepted by The Company as the Defendant. According to that company written in their exceptions they argued that the Plaintiff's lawsuit was not explicit or *obscurlibel* because the plaintiff could not prove, explain, and mention the respective defendant's role in committing an offense. In fact, in the description of the lawsuit, the Plaintiffs have stated the respective defendant's role in carrying out the crime along with its chronology. Therefore, it is also considered by the Judges to reject the exception filed by the Defendant, and the Judges stated that the Defendants had committed the act unlawfully.

If the verdict was further analysed, the judges to impose the punishment on the defendants is the customer's refund is by the consideration of "unlawful act" committed by the defendants, but in the judgment, the judge does not specify which article is the basis of the determination of the act Against the law. This becomes very interesting to be studied further because in the judgment the judge refers to the criminal judgment imposed against the defendants who have been stated first, resulting in the actions committed by the defendants is unlawful and worthy to be punished. This means that the judge's reference to determine that the case is unlawful is a criminal verdict based on the Criminal Code.

Unlawful acts are any conduct that is prohibited and threatened with criminal sanction by criminal law must be unlawful.¹⁰ Based on the above, the term of the

⁸ Putusan No 401/Pdt.G/2010/PN.JKT.Sel, at 26.

⁹ Putusan No 401/Pdt.G/2010/PN.JKT.Sel. at 24-26.

¹⁰ Amir Ilyas, *Asas-asas Hukum Pidana memahami Tindak Pidana dan Pertanggungjawaban Pidana sebagai Syarat*

unlawful act is emphasized on the existence of prohibitions and sanctions that have clearly been regulated in the Criminal Code or other written legislation. However, furthermore the nature of the act against the law of an act there are 2 (two) kinds, namely:¹¹

1) The nature of unlawful formil (*formale wederrechtelijk*)

According to this opinion, what is meant by unlawful acts is an act which satisfies the formulation of the law, unless there are exceptions specified in the law, for this opinion, against the law is against the act, because the law is an act.

2) The nature of unlawful material (*materielewederrechtelijk*)

In this opinion, it is not necessarily the act which fulfills the act's definition is unlawful. For this reason the so-called law is not only a law that is written, but also includes an unwritten law, that are norms or rules prevailing in society.

Based on these description, the description of the act against the law can be interpreted from two views that an act can be regarded as an unlawful if the act is clearly regulated or contrary to the rules and reality that live in society, but must be clearly basic in the mention of a deed is an act against the law. If we refer to the Civil Code of unlawful conduct stipulated and stated in Article 1365 which states that "Any act that violates the law and brings harm to others, requires the person who caused the loss by his mistake to replace the loss". Under this article, basically unlawful conduct can be judged by both normative laws and living laws, and violations of such rules could be subject to sanctions or damages.

In the criminal realm, the directors and commissioners of The Company who are involved in this case have been sentenced to imprisonment. Then, this case is also brought to the civil way, namely sued to restore and replace the losses suffered by the customers.

Other considerations given by the judges in the verdict on the responsibilities of the Directors are using the perspective of the Indonesia Company Law, in Article 97 Paragraphs 1,2 and 3¹², stating that:

1) The Directors shall be responsible for the management of the Company as referred to in Article 92 paragraph (1).

Pemidanaan, Mahakarya Rangkang Offset, Yogyakarta, 2012, at 53.

¹¹ *Ibid*, at 53.

¹² Undang-Undang Nomor 40 Tahun 2007 tentang Perseroan Terbatas

2) Management as referred to in paragraph (1) shall be executed by each member of the Directors in good faith and full of responsibility.

3) Each member of the Directors shall be fully liable in person for the loss of the Company if the person concerned is guilty or fails to perform its duties in accordance with the provisions referred to in paragraph (2).

Another article which the judges consider in giving a decision is Article 114¹³, stating that:

1) The Board of Commissioners is responsible for the supervision of the Company as referred to in Article 108 paragraph (1).

2) Every member of the Board of Commissioners shall be in good faith, prudent and responsible in carrying out supervisory and advisory duties to the Directors as referred to in Article 108 paragraph (1) for the benefit of the Company and in accordance with the purposes and objectives of the Company.

3) Every member of the Board of Commissioners shall be personally liable for the loss of the Company if the person concerned is guilty or fails to perform his duties as referred to in paragraph (2).

The article is used by the judges to determine the liabilities the directors and commissioners on the case of Sarijaya Permana Sekuritas Company. Based on the analysis on the article used by the judges to determine that the case is unlawful, the Judges are also based on the criminal decision, which is based on the embezzlement article contained in the article of the Criminal Code. However, if viewed chronology of the case is a crime in the capital market, which should in the settlement applied capital market law. However, in the Act Number 8 of 1995 concerning Capital Market there is no article stating that embezzlement by the Company is a criminal act in the Capital Market. Crime or prohibition in the capital market is regulated in Article 90 in The Capital Market Act, explaining that any party is prohibited to commit fraud, market manipulation and insider trading, furthermore listed by parties in securities trading is prohibited to:

- 1) Deceive or deceive others by means of any means
- 2) Participate in deceiving or deceiving others; and
- 3) Making false statements about material facts or not disclosing material facts so that statements made are not misleading about the circumstances occurring when statements are made with a view to profiting or avoiding harm to themselves or other parties or with the intention of influencing other parties to purchase or selling effects.

¹³ *Ibid*

Another crime that is also regulated in Capital Market Law is a criminal act of market manipulation. Some actions that can be categorized as follows:¹⁴

- 1) Creating a fake capital market picture by:
 - a) Conduct securities transactions that do not result in a change of ownership, or
 - b) Conducting buying and selling bids or securities purchases at a certain price, while the other party who is a conspirator also makes a buy or sell offer at a similar price (Article 91 of the Capital Market Act).
- 2) Conducting two or more securities transactions on the stock exchange causing the price of securities to rise or fall, in order for the other party to be affected to buy, sell or hold the securities. As a result, the price of such securities is not based on the actual buy or sell demand (Article 92 of the Capital Market Act).
- 3) Making statements or misrepresenting material materially that may affect other parties to buy or sell securities.

Based on the Indonesia Capital Market Law, there is no mention of the embezzlement, but there is only fraud. Basically fraud and embezzlement are not the same. Each has a different understanding and arrangement. In the Criminal Law, embezzlement is regulated in Article 372 of the Criminal Code, while fraud is also provided for in Article 378 of the Criminal Code. What is meant by the embezzlement is the act of taking the property of another person (partly or wholly) where the control over the goods already exists on the perpetrator, but the control takes place legally.¹⁵ More details are mentioned in Article 372 of the Criminal Code that : *Whosoever intentionally and unlawfully possesses anything wholly or partly belonging to another, but who is in his power not because the crime is threatened by embezzlement, with a maximum imprisonment of four years or a fine of nine hundred rupiah.*

While the fraud in Article 378 of the Criminal Code is mentioned that: any person with the intent to benefit himself or others unlawfully, using false or false dignity, with deceit, or set of lies, move others to surrender things to him, Or to provide debt or write off accounts receivable, threatened for fraud with a maximum imprisonment of four years.

Basically a crime is included in fraud or embezzlement depending on the evidence in court to convince the judges. Regarding the proof of capital

market crime itself is quite difficult. This is one of the main reasons for not serious investigation. Difficulties in the proof are generally due to crimes in the field of capital markets conducted with electronic systems. In addition, The Authorities assume, such as insider crime, perpetrators take shelter behind institutions or their securities accounts.¹⁶

The evidence in exposing capital market crimes requires serious attention from law enforcement officers, including in disclosing the case of Sarijaya Permana Sekuritas Company. Based on the chronology of the case and an explanation of the difference in understanding of embezzlement and fraud described by the Criminal Code. There is a legal vacuum (*rechtsvacuum*) in that case because there is no regulation regarding criminal act of embezzlement in Capital Market Law. Therefore, in this case the judges are required to explore and find the law.¹⁷ It was also mentioned by Sudikno Mertokusumo as quoted in Cristi stating that: *The judge should not refuse to examine and prosecute a matter under the pretext that there is no law governing it. In this case the judge experiences a legal vacuum and must use the analogy thinking method, the legal narrowing method and contrario method to solve the case.*

Based on the opinion of Prof. Sudikno Mertokusumo then basically the judge in handling the case is required to conduct legal narrations, interpretations and find the law (*Recthvinding*) of the case. In addition to Prof. Sudikno Mertokusumo's opinion, the judge's prohibition to refuse a case is due to legal vacuum is also contained in Article 10 paragraph (1)¹⁸ stating that: The court is prohibited from refusing to examine, adjudicate, adjudicate a case filed with a law argument absent or less clear, but obligatory to examine and prosecute it."

The Article means that a judge is obliged to conduct a investigation and adjudicate a case even though there is no law governing it, therefore the judge is required to find the law, because it has a very important meaning for certainty the parties.

¹⁶ Hamud M Balfas, *Hukum Pasar Modal Indonesia Edisi Revisi*, Tata Nusa, Jakarta, 2012, at 512.

¹⁷ Frisca Cristi, "Akibat Hukum Kewajiban Berbahasa Indonesia berdasarkan Pasal 31 Undang-Undang Republik Indonesia Nomor 24 Tahun 2009 terhadap Production Sharing Contract (PSC) di Bidang Perminyakan di Indonesia" Tesis Fakultas Hukum UI, 2010, at.20

¹⁸ Undang-Undang Nomor 48 Tahun 2009 tentang Kekuasaan Kehakiman.

¹⁴ Yulfasni, *Hukum Pasar Modal*, Badan Penerbit IBLAM, Jakarta, 2005, at 117-118.

¹⁵ Hukumonline.com. *Penggelapan dan Penipuan*, Accessed on 18 September 2016, at 19.07 pm.

Relating to the legal vacuum contained in that case, The judges refer to the criminal ruling that has been imposed on the defendants and declared the act committed by the defendant is an unlawful act. The case of embezzlement in the capital markets occurring within Sarijaya Permana Sekuritas Company should be taken into account by the making of policy because the cases in the capital market sectors highly increase, hence regulation in the capital markets must be suited. In its development although not specifically regulated on the capital market. One of Indonesia's independent financial institutions, the Financial Services Authority (OJK) with its Law, namely The Act Number 21 of 2011 in Article 4 states that :

The Authorities was established with the aim that all activities within the financial services sector:

- a. Organized regularly, fairly, transparently and accountably;
- b. Able to realize a sustainable and stable financial system; and
- c. Able to protect the interests of consumers and society.

In the elucidation of Article 4, it is explained that with the stated objectives, The Authorities is expected to support the interests of the national financial services sector so as to enhance national competitiveness. Furthermore, in the explanation of Article 4 letter c which is meant to "protect the interests of consumers and society" including protection against violations and crimes in the financial sector such as manipulation and various forms of embezzlement in the financial services activities.

Under article 4 and its explanation, expectantly The Authorities can support financial services activities in Indonesia. Indirectly about the embezzlement, there has been arrangement with reference to article 4, but regulations concerning embezzlement in the field of capital markets are not directly regulated and sanctions against violations have not been clearly regulated.

B. The Law that should be used related to the Transaction of Customer Funds by The Company (PT. Sarijaya Permana Sekuritas)

Based on the description and case analysis earlier, the problems in the case not only include unlawful acts in civil law but also including crimes in criminal law. Then the question of which crime is meant in the case.

According to the police, this case is included in crime in the capital market that is fraud in accordance with Article 378 of the Criminal Code. In the Criminal Code (Penal Code) Article 378 on fraud, it is stated that the fraud is: "Anyone with the intent to benefit himself

or others unlawfully, using false dignity, with tricks, or lies, moves others to surrender something to him, or to give debt, Fraud with a maximum imprisonment of four years. "

The article contains elements of action to benefit oneself or others by:

- a. against the law,
- b. Using false names or false dignity,
- c. Doing a trick, or a series of lies
- d. Moving others to surrender something to him, or to give debt and wipe it out credit.

The four elements in Article 378 of this Criminal Code have been fulfilled in the case. In the problem of this case also contains elements of crime contained in Article 90 of Act Number. 8 of 1995 on Capital Market as described in the previous chapter. The Capital Market Law has indeed established the types of criminal acts in the capital market field. The capital market crime as regulated by the Capital Market Law especially regarding the act of fraud is contained in article 90, which reads as follows:

In Securities trading activities, each Party is prohibited directly or indirectly:

- a. Deceiving or tricking the other Party by means of any means and or means;
- b. Participate in deceiving or deceiving others; and
- c. Make false statements about material facts or do not disclose material facts so that statements made are not misleading about the circumstances that occurred when a statement was made with a view to profiting or avoiding any loss to yourself or any other Party or with the intention of affecting the other Party to buy or sell Securities.

The elements of capital market crime committed by Sarijaya Permana Sekuritas Company to its customers' funds can indeed be said in accordance with the criminal acts classified in article 90 of the Capital Market Act because The Company is proven to have indirectly fooled its customers with the intention to benefit themselves by means or any way such as buying and selling shares using the account of the 17 (seventeen) *nominee* customers and using customer funds unbeknownst from the customers.

Meanwhile, according to The Authorities this case is not included in Capital Market crime, but included in general crime, as described in chronology above case, in which case there is embezzlement of funds conducted by Directors and Commissioners of Company, which Its elements meet elements of criminal act of embezzlement rather than fraud.

It is stated in Article 378 of the Criminal Code that a crime can be categorized as an act of fraud if in the

effort to control certain goods or objects done by the perpetrators of fraud in a way that is against the law. Associated with the legal case of The Company, this is clearly not in accordance with the contents of Article 378 of the Criminal Code of fraud because in terms of mastery of customer funds by Sarijaya Permana Sekuritas Company did not in any way violate the law and the customers without any compulsion from any party to surrender the funds to the company with a view to making long-term investments.

Actually, there is another article that needs to be considered in connection with the use of rules for this legal case, namely article 372 of the Criminal Code on embezzlement with the contents of the article as follows: "Whoever deliberately and unlawfully owns something wholly or partly belongs to another, but who is in his power not because the crime is threatened by embezzlement, with a maximum imprisonment of four years or a maximum imprisonment of four years or a maximum fine of nine Hundred dollars. "Arrangement in Capital Market Law Number 8 of 1995, particularly in article 90 to settle the crime in capital market, only regulate fraud only while that done by Permana Sarijaya Sekritas Company is an act of embezzlement.

In addition, in the case of this law, the defendant proved to ask his staff to raise the limit of transactions or Trading Available (TA) because the funds in the 17 (seventeen) *nominee* customers is not sufficient to make transactions. With this it can be said that there is involvement of other parties who help the course of the crime. This is in accordance with Article 55 of the Criminal Code especially in paragraph 1 (1) which reads as follows: Sentenced as a criminal offender: 1. those who do, who order to do, and participate in doing the deed.

Based on the article, Sarijaya Permana Sekuritas Company can be concluded to have committed a joint fraud against the customer's funds because it is in accordance with the elements mentioned in Article 372 of the Criminal Code *juncto* Article 55 of the Criminal Code.

Therefore, according to the analysis that has been done by the author, The law that should be applied to this case is Article 372 *juncto* Article 55 of the Criminal Code because of the element of fraud in the case is not fulfilled. Therefore, it should be analyzed based on the embezzlement article that is associated with deeds done jointly.

In addition to the application of laws in accordance with the rules, strict supervision of transactions conducted within the capital market also needs to be done by The Authorities as an institution

authorized to conduct supervision to prevent similar cases from happening again. Because the criminal acts committed by directors and commissioners in that case has been going on for a long time. If the supervision is done strictly then the expected losses incurred can be minimized. The Authorities it self reserves the right to order the dismissal of an activity in violation of any regulation.¹⁹

Regarding the importance of supervision on capital market is also discussed by Balfas²⁰ stating that supervision is the most important thing to be done by the authorities. This is because supervision is one of the means by which the creation of an orderly, fair and efficient securities trading which is the purpose of the establishment of the stock exchange itself. Based on the analysis and statements, the application of appropriate law and good supervision by The Authorities are important thing in protecting investors from the crimes committed in the capital market.

III. CONCLUSION

Juridical analysis in case of Sarijaya Permana Sekuritas Company according to the author, there is a *rechtsvacuum* in the judgment states that the defendant has committed an act against the law based on the criminal decision but the case is a capital markets case that should be a crime that occurs in the capital market applied Indonesia Capital Market Law. However, in the Capital Market Law there is no article stating that the act of embezzlement perpetrated by the defendants is illegal, therefore, the perpetrators' accountability in the case must be applied to the Criminal Code as a general rule governing embezzlement.

The law that should be applied in the case is Article 372 of the Criminal Code *juncto* Article 55 of the Criminal Code concerning embezzlement carried out jointly. The application of the article in view of the crimes committed by the defendant has fulfilled the element of the embezzlement article in general. The application of the embezzlement article contained in the Criminal Code is due to the non-regulation of embezzlement crimes in the Act of Capital Market Number 8 of 1995.

In addition, governments, especially regulators should be able to continue to update the regulations in

¹⁹ Hamud M Balfas, Tindak Pidana Pasar Modal dan Pengawasan Perdagangan di Bursa, *Jurnal Hukum dan Pembangunan Edisi Januari-Juni 1998*, at 514.

²⁰ *Ibid*, at 47.

the capital market. This is because the capital market business is developing and moving very dynamic and the crimes that occur in the capital market sector increasingly varied. Through continuous regulation, it is expected that cases and all forms of problems in the capital market can be solved well.

2. Supervision by The Authorities as an institution having authority to supervise all forms of trade transactions in the securities field should be improved. This is considering the misuse of funds committed by the defendants against the plaintiff's funds within a period of several years, therefore if the incentive monitoring is done then this case may be known more quickly and losses suffered by customers can be minimized.

REFERENCES

- [1] M.Irsan Nasarudin and Indra Surya, "Aspek Hukum Pasar Modal Indonesia, Prenada Media, Jakarta, 2004
- [2] Sumantoro, Aspek – Aspek Hukum dan Potensi Pasar Modal di Indonesia, Ghalia Indonesia, Jakarta, 1990.
- [3] Indra Surya, Transaksi Benturan Kepentingan Di Pasar Modal Indonesia, Lembaga Studi Hukum Dan Ekonomi, Jakarta. 2009.
- [4] Soerjono Soekanto dan Sri Mamudji. Penelitian Hukum Normatif. PT. Raja Grafindo Persada, Jakarta. 2012
- [5] Sulistyowati Irianto dan Sidharta, Metode Penelitian Hukum : Konstelasi dan Refleksi. Yayasan Pustaka Obor Indonesia, Jakarta. 2011.
- [6] Peter Mahmud Marzuki. Penelitian Hukum, edisi revisi Jakarta: Prenadamedia, Jakarta, 2005.
- [7] Putusan No 401/Pdt.G/2010/PN.JKT.Sel, at 26.
- [8] Putusan No 401/Pdt.G/2010/PN.JKT.Sel. at 24-26.
- [9] Amir Ilyas, Asas-asas Hukum Pidana memahami Tindak Pidana dan Pertanggungjawaban Pidana sebagai Syarat Pemidanaan, Mahakarya Rangkang Offset, Yogyakarta, 2012, at 53.
- [10] Ibid, at 53.
- [11] Undang-Undang Nomor 40 Tahun 2007 tentang Perseroan Terbatas Ibid
- [12] Yulfasni, Hukum Pasar Modal, Badan Penerbit IBLAM, Jakarta, 2005, at 117-118.
- [13] Hukumonline.com. Penggelapan dan Penipuan, Accesed on 18 September 2016, at 19.07 pm.
- [14] Hamud M Balfas, Hukum Pasar Modal Indonesia Edisi Revisi, Tata Nusa, Jakarta, 2012, at 512.
- [15] Frisca Cristi, "Akibat Hukum Kewajiban Berbahasa Indonesia berdasarkan Pasal 31 Undang-Undang Republik Indonesia Nomor 24 Tahun 2009 terhadap Production Sharing Contract (PSC) di Bidang Perminyakan di Indonesia" Tesis Fakultas Hukum UI, 2010, at.20
- [16] Undang-Undang Nomor 48 Tahun 2009 tentang Kekuasaan Kehakiman.
- [17] Hamud M Balfas, Tindak Pidana Pasar Modal dan Pengawasan Perdagangan di Bursa, Jurnal Hukum dan Pembangunan Edisi Januari-Juni 1998, at 514.
- [18] Ibid, at 47.

Interaction Strategies Used in an Online Learning Medium by Tertiary Level Students in English for Specific Purposes Course

Sopit Jenpradab, Allan Kongthai

School of Liberal Arts

Mae Fah Luang University (MFU)

Chiang Rai, Thailand

5851006255@lamduan.mfu.ac.th ; allan_mfu@yahoo.com

ABSTRACT

Negotiated interaction could be one crucial factor which can facilitate the English for Specific Purposes (ESP) learners to achieve their goals both academic and professional domains in the future. This study, therefore, aims to examine two major aspects: the negotiation for meaning strategies that ESP students used in the Computer-Mediated Communication (CMC) interaction as well as to explore the ESP students' perceptions toward using the CMC, whether it leads to their Macro and Micro skills perceptions or not. The data were collected from 25 Business Writing students who are Thai, majoring in English. The study was conducted by using Facebook (FB) group and FB messenger as a CMC medium for the communication; therefore, the comments from pictogram postings and chat logs from FB messenger interactions were used as the main sources in the data analysis process. The Computer-Mediated Discourse Analysis (CMDA) proposed by Herring (1996) was employed in the data analysis. Furthermore, coding framework was processed by applying the negotiation for meaning strategies taxonomy that obtained by Samani, Nordin, Mukundan, and Samad (2015). Additionally, the researchers also conducted a focus group interview in order to get the perceptions of students toward what they have encountered. Findings can be revealed into two main parts. Firstly, it revealed that there are nine strategies occurring in the CMC medium: elaboration, confirmation, elaboration request, reply elaboration, confirmation request, reply confirmation, clarification request, correction/self-correction, and reply clarification, respectively. Aside from nine strategies, paralinguistic features, appeal for help, vocabulary request, and reply vocabulary were also found as additional strategies. However, vocabulary check was not found in this study. Secondly, it was found that the ESP students perceived both Macro and Micro skills perceptions toward implementing CMC in the ESP teaching and learning. Therefore, to conclude, the negotiated meaning strategies were used by the students while they were interacting to each other via CMC interaction in order to achieve the discussion activities and also solve some difficulties in such conversations. Additionally, applying this medium could be able to facilitate the learners' knowledge and increased the practical experiences which are professional domains in the future workplace.

Keywords : Interaction and Negotiation for Meaning Strategie; Computer-Mediated Communication; English for Specific Purposes; Macro and Micro Skills Perceptions

I. INTRODUCTION

Due to the increasing use and integrating of Computer-Mediated-Communication (CMC) platforms into the classroom context, it becomes clear that studying and interacting only in the means of Face-To-Face (FTF) interaction in the classroom is not enough for students to use, practice, and master the target languages in the real situations. It is shown in the previous studies that using and complimenting CMC into the teaching and learning methods facilitate learners in various ways. Moreover, CMC learning increases the interaction between students themselves and also with the teachers as well. As Long and Ellis have mentioned, interaction is proved to be one of crucial elements which assist and influence the learning process, outcomes, and development of students [1] [2]. Moreover, within this

circumstance, if there is some difficulties emerge in the conversation, the learners will try to overcome those difficulties by negotiating the meaning using some interactional strategies in order to reach their goals in conversation. Hence, this process will facilitate the language learning later [3].

Regarding the interaction in English for Specific Purposes (ESP) context, where the goal is to improve the students to be able to use the language both linguistic forms and career-related contents in each professional domain effectively, interaction is also concerned as a crucial factor in the learning process. Furthermore, due to the dramatically increasing of the integrating CMC as a learning tool into the teaching methods, many ESP educators believe that it can be used to provide more opportunities for students to learn and perceive the language in an alternative and more authentic environment [4] [5]. Under the CMC learning platforms,

the ESP learners have more opportunities to expose themselves into authentic materials which are fully provided and appeared by a number of sites. Moreover, it allows learners to interact with others more naturally [6]. Thus, the learners will get to practice and master the knowledge which they have been taught in classroom more freely and naturally.

However, based on the literature, there are considerably huge number of previous studies that have investigated and also examined the roles and effects of CMC on the students' learning process and outcomes in various contexts; whereas, there is a few studies that examined the interaction process focusing on the negotiation strategies used in the online interactive platform in the ESP course. Hence, as long as the ESP teaching and learning methods are impacted by the integration of CMC in classroom contexts or teaching and learning practices, it is crucial and worth investigating the interaction and the negotiated interaction strategies which the students use in this certain context. To this end, this study aims to answer the research questions below:

1. What *negotiation for meaning strategies* do ESP students use when the conversation breaks down, particularly in the CMC online interactive medium?
2. What are *the ESP students' perceptions* toward the integrating of CMC learning medium into the ESP course?

II. LITERATURE REVIEW

In this section, there are three main focuses which the researcher intends to explore and review: the interaction and negotiation for meaning strategies; Computer Mediated Communication; Macro and Micro skills perceptions. Moreover, the related studies are also included in each focus as well.

A. Interaction and negotiation for meaning strategies

In general, Brown purposed that "*Interaction is the heart of communication; it is what the communication is all about*" [7]. In other words, people interact to one another in order to express their ideas or their feelings toward this communication process. For this reason, the human beings interact to one another in order to reach an achievement of the certain goals. Therefore, it is very important stage for human beings to exchange their ideas and thoughts through each situation.

However, to put it more specifically, regarding the interaction in language teaching and learning contexts, interaction is claimed as one of the most crucial elements which the language is enhanced through the process [8].

Moreover, Long further mentioned that within this process, the learners have a chance to overcome the difficulties or conversation break-down in the conversations through the negotiated interaction process; thus, it leads to the knowledge enhancement [1]. Based on the literature, studies indicated that throughout the negotiated interactions, such as confirmation check, clarification request, comprehension check, etc., it facilitated and enhanced the students' language development in various ways [9] [10]. Therefore, it can be concluded that the negotiated interaction might be one of crucial elements which could lead directly to the language learning and development.

Regarding the interaction role in the ESP contexts, the teaching and learning process in this particular context is considerably different from the general language teaching contexts due to the natures of ESP approach; however, the interaction also seems to play a significant role in this particular context as well. Indeed, without interaction, the learners will not be able to use and produce what they have learned effectively in their real life and future professional domains at a workplace. To illustrate, Loewen states that the students are able to learn and receive things better after they have encountered the language forms while they are negotiating and interacting in the meaningful context because this process allows them to process and practice what they have learned then further noticed the language forms which enable them to incorporate it into their capacity [11]. At the end, they would be able to recognize and also produce the better language forms. Therefore, within this sense, the researcher believes that this process is very crucial for students to develop what they have learned. Later, they will be able to use it in their professional domains in the future. Thus, it is worth investigating the negotiated interaction in this particular context, ESP.

B. Computer Mediated Communication (CMC)

As the researcher has stated in the previous section that the interaction is very crucial element and it affects the learning process and outcomes in various different ways, the contexts where the interaction is occurred, are equally important for the learning development as well. There are considerably huge numbers of studies and research which have investigated the relationship between interaction roles and language learning outcomes that emerged in the FTF classroom interaction; however, there are quite a few numbers that chiefly focused on the online learning context, especially focusing on the applying the CMC or social networking in educational purposes. Therefore, this section is chiefly

emphasized on the CMC definitions and how the interaction under this medium affects the teaching and learning outcomes.

Basically, the Computer Mediated Communication (CMC) was first coined by Hiltz and Turoff as “*the process by which people create, exchange, and perceive information using networked telecommunication systems that facilitate encoding, transmitting, and decoding messages*” [12]. Moreover, Romiszowski and Mason also stated that the CMC is widely used in a number of systems which allow people to communicate by using the networks and computers, for example, electronic mail, video conferencing, bulletin boards, and etc. [13]. As a result, educators were interested in applying this medium into educational context. Later, it was rapidly employed in the teaching and learning purposes as a new mediated medium [14]. According to the CMC, there are two types of the CMC modes: Synchronous (SCMC) and Asynchronous (ACMC). As Warschauer has stated, the SCMC was defined as the real time communication where people can online and interact to one another at the same time such as chat and instant message applications, and etc. [15]; whereas, the ACMC differs from SCMC in term of synchronicity because people interact and communicate in the means of delayed interaction such as e-mail, bulletin boards, web boards, and etc. [16]. Hence, due to its characteristics, the CMC can benefit to the teacher and students in several matters where the FTF interaction do not provide. Based on the empirical studies of the using and applying CMC in teaching and learning process, the studies claimed that integrating online or networked technologies into the classroom contexts can enhance and facilitate language learning process and outcomes in many language areas such as four language skills and other language components as well [17] [18] [19].

However, this study focuses only on the Facebook (FB) as a CMC medium due to its features. The FB is widely used among the tertiary level students and it is widely applied in the educational contexts as well [20]. According to Pempek, Yermolayeva, and Calvert, they indicated that the social networking sites provide several unique ways for people to communicate with one another which bring the rapidly growing numbers of users later [21]. Based on the FB features, it provides potential environment for students to learn and interact with one another in the authentic settings. This study, therefore, intends to explore the interaction process which emerge under the FB interaction in order to maintain an in-depth ideas and understandings of how the online interaction process occur in this particular medium between the ESP students themselves and

teacher-students interaction when they have to engage and negotiate with one another under this specific purposes context. Moreover, as long as the FB has been using in the educational areas, it is worth exploring its effects toward the teaching and learning process within this particular context.

C. Macro and Micro skills perceptions

Basically, perceptions can be referred to various definitions depending on the individual perspectives because different person perceive things differently. For example, according to a Webster's New World College dictionary, it displays a perception definition as “*the act of perceiving or the ability to perceive; mental grasp of objects, qualities, etc. by means of the sense; awareness; comprehension; the understanding and knowledge*”[22]. Therefore, in general sense, the perception could be referred to the ways people think or understand toward their surroundings. However, regarding the educators and language researchers' perspectives, perception is one of the crucial factors that have been proved to impact the students' learning outcomes, language performances, ability, and development in various ways [17] [23] [24].

Nonetheless, in this study, the researcher has distinguished the ways students perceive things into two main different areas; Macro and Micro skills areas. In general, the macro skills refer to the linguistic competences; whereas, the nonlinguistic competences are the micro skills perceptions [25]. As Brown further stated that

“the four areas of language proficiency involves a variety of micro skills such as using appropriate and acceptable grammatical systems in writing is one of micro skills in writing area, distinguishing between the implied and literal meanings of reading sources is one of the reading area, etc.”. [26]

In this study, therefore, the macro skills can be referred to the four main linguistics skills such as listening, speaking, reading, and writing; whereas, the micro skills can be referred to the non-linguistic skills which will help to support and enhance those macro skills to work better such as the collaborative skills [27], critical thinking and analysis skills [28], self-regulated learning skills [29], cognitive and social skills [29] [30], and etc. Thus, the macro and micro skills perceptions were distinguished and categorized as it is shown in the Figure I below.

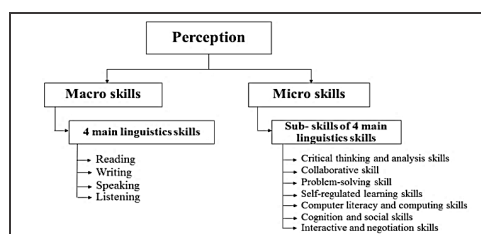


Figure I. The Macro and Micro skills perception model

To this end, the researcher believes that if the researcher is able to explore the perception of students toward integrating FB into ESP classroom context by focusing on the macro and micro skills knowledge perceptions, she will be able to get an in-depth understandings about their perceptions and skills that they obtain from the CMC online interactive medium. Furthermore, it will help the researcher gets more precise ideas about how this medium effects on students' perceptions as whether it is worth integrating into the classroom context or not.

III. RESEARCH METHODOLOGY

Regarding the research methodology, the qualitative research method was employed in this study. In this section, the researcher intends to outline how the data is collected. Moreover, it also aims to indicate how the collected data will be analyzed by based on and adapted from related approach and empirical studies.

A. Participants and context of the study

In this study, the purposive sampling technique was employed. The key informants were 25 Non-Native English speaker students, 3rd - 4th year tertiary level students, majoring in English, Mae Fah Luang university, Thailand. Their ages vary from 18 to 22 years old. The researcher purposively chose the 3rd and 4th year students of English major who are studying in ESP course, English for Business Writing course, due to the nature of this course that provides the meaningful context and sources for collecting the data.

B. Research instruments and tools

According to the research objectives, there were four main research tools which have been used in this study; the key informant sheet, Facebook (FB) group and messenger sites, the Pictograms, and guideline interview questions.

The key informant sheet consisted of two main sections; section A and B. The section A solicited the students' demographic information; whereas, the section B was comprised of the questions about their experiences using the CMC. Therefore, the researcher was able to receive both general and in-depth information about their demographic data and participants' experiences using CMC as a medium.

The Facebook (FB) group and messenger were used as a medium for key informants themselves and lecturer to engage, interact, and communicate outside the normal classroom context.

The Pictograms or pictograph refers to the pictures or images which were used to convey the meaning by pictorial similarity to physical materials or matters. In this study, the pictograms were used as a supplementary material which were designed parallelly with the contents from the Business writing supplementary book.

The guideline questions were used in the focus group interview session in order to guide the participants to answer the questions. The questions were covered all the research objectives, questions, and the themes that emerged during the observation and data analysis process; thus, it helped the researcher to gain more understandings and insights into their perceptions toward the use of FB in the ESP course interaction.

C. Data collection process

This study took a semester (15 weeks) to conduct and collect the data. However, in order to collect the data, the researcher did not interfering the classroom interaction because she only collected the data through the CMC platform, Facebook sites, outside the classroom setting. Hence, in order to make this data collection process more systematic, the process was divided into three stages: pre-stage, during-stage, and post-stage. The collected data process diagram is shown in the Figure II below.

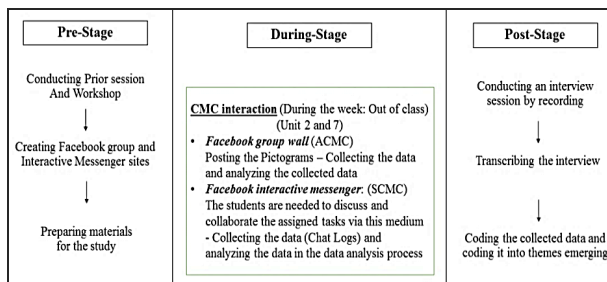


Figure II. Data Collection Process

In the pre-stage process, the researcher conducted a prior session which included conducting the workshop and creating FB group and FB interactive messenger, respectively. The “Interaction Expressions in Business Negotiation” workshop was conducted in order to distribute a key informant sheet to key informants and also to give them more opportunities to expose, learn, and acknowledge the negotiated interaction strategies. After the workshop was done, the closed-FB group and FB messenger were created. Then, she invited the participants to join the FB group and messenger sites as well.

The during-stage was focused on the CMC interaction by using both the FB group and FB interaction messenger sites as a medium. In the FB group wall, the Pictograms were posted after the FTF classroom interaction has done because these supplementary materials were used as an extra material to facilitate and give students more convenience accessibility to the classroom contents. The students were informed to post, to ask any questions, or to discuss in the form of comments under each pictogram. The comments which the participants produced were collected and analyzed in the analysis process later. Additionally, in the FB interactive messenger site, the participants were assigned to do the Business Writing content-related discussion activity after they have attended and learned in the classroom sessions. At the end of each FB messenger interactive session, the researcher collected the chat logs as the main data.

Lastly, a post-stage process, the focus group interview was conducted after the students have attended the last sessions of FB interactive messenger session. The key informants were asked or interviewed about their opinions and perceptions toward the things that they have been influenced. Therefore, this process provided considerably rich and detailed perceptions from the key informants. The interview was recorded and transcribed, then analyzed the main themes emerging later.

D. Data Analysis Process

In order to answer the first research question, the means of Computer-Mediated Discourse Analysis (CMDA) approach, proposed by Herring, was employed [31]. Based on CMDA approach, there are four domains of language which are focused; structure, meaning, interaction, and social behavior; however, this study was chiefly focused on the *interaction domain*. As proposed by Herring, the main phenomena in this domain are turn-taking, topic development, and other means of negotiation interactive exchanges [32]. Therefore, it was used to identify the discourse patterns that occurred during the conversations [33].

Additionally, in the coding process, the taxonomies of negotiated meaning functions which obtained by Samani, et al. were used. The turn-takings from the collected data were analyzed based on the table 1 below. Besides, if there are any unmarked strategies appear in this study findings, the researcher also included it in the data findings as well. The taxonomy is shown in Table 1 and also illustrated with the data from previous studies.

Table 1. The negotiation for meaning strategies taxonomy

| Functions | Explanation | Example |
|-------------------------------|---|--|
| Clarification Request | One speaker seeks assistance in understanding the preceding utterances | A: so did you come here by yourself? Or did you come with friends? B: <u>no no I...what? What you say?</u> |
| Confirmation check | Asking for confirmation of a previous statement | A: Did you get high marks? Good grades? B: <u>High marks?</u> A: good grades A and B, did you get A in Math? |
| Confirmation | Confirming the previous statement (although there is no confirmation request) | A: I think she mean that her father wants her to marry the guy she meets in Japan... she did it for the sake of her father... B: but there was no mention of father force C: <u>yeah there is no mention of a father</u> |
| Correction or Self-correction | Correcting the errors which made by others/or self-correction | A: he bought a <u>perse</u> for his wife. B: how much is a purse? A: <u>*purse</u> |
| Vocabulary check | Checking whether the other participants know the meanings or not | A: <u>Invaluable? What does it mean?</u> B: cheap? C: not precious isn't it? |
| Elaboration | Elaborating the meaning of preceding statement | A: Maybe she meant that she is a woman, and it is her duty to get married. A: <u>Well, I just thought that way.</u> B: I disagree |

| | | |
|---------------------|--|--|
| Elaboration request | Requesting elaboration if he/she does not understand the previous statement/utterances | A: did she lie? B: She wasn't honest about the necklace. <u>A: How?</u> B: She replaced it without telling the true story |
| Reply clarification | Clarifying his/her previous statement as a result of request | A: wasn't it the truck is for the old man so that they will be sent far away B: to take the old man? <u>A: like the old man.</u> |
| Reply confirmation | Confirming a statement when someone requests confirmation | A: you have to agree that society during early 60s is more conservative to compare than early 2000, right? <u>B: indeed</u> |
| Reply elaboration | Elaborating his/her own statement to make it clearer as a result of request. | A: parents decision is very important B: Maybe... but what if you they made the wrong decision? <u>A: if they made the wrong decision then they have to face the consequences not the others</u> |

Regarding the second research question, the content analysis was employed as a method to code the transcribed data of each response items from the focus group interview. Later, those data were categorized into major themes; macro and micro skills perceptions as it was defined and categorized in the previous section. Therefore, in order to code the data, the researcher has applied the macro and micro skills perceptions model which is shown in the Figure 1 as a grounded data coding framework. However, if there is any other skill perception found, the researcher also included in the findings as well.

IV. FINDINGS AND DISCUSSION

Findings can be revealed into two main parts: the negotiation for meaning strategies found; the students' perceptions toward integrating CMC, Facebook site, into the ESP teaching and learning method. Therefore, this section illustrates the study findings and the conclusion is followed.

A. Negotiation for meaning strategies

In response to the first research question, the comments from pictogram postings and FB chat logs were collected and analyzed. Based on the coding process framework as obtained by Samani et al, findings revealed that there are nine strategies emerging in the FB medium: elaboration, confirmation, elaboration request, reply elaboration, confirmation request, reply confirmation, clarification request, correction/self-correction, and reply clarification, respectively. Aside from nine strategies, paralinguistic features, appeals for help, vocabulary request, and reply vocabulary were also found as additional strategies. However, vocabulary

check was not found in this study. The frequency and percentage of each strategy used are shown in the table 2 below.

Table 2. The negotiation for meaning strategies found

| Negotiation for meaning strategy | Frequency | Percentage |
|----------------------------------|-----------|------------|
| 1. Elaboration | 69 | 18.30 |
| 2. Confirmation | 58 | 15.40 |
| 3. Elaboration request | 41 | 10.87 |
| 4. Reply elaboration | 41 | 10.87 |
| 5. Confirmation request | 29 | 7.69 |
| 6. Reply confirmation | 27 | 7.16 |
| 7. Clarification request | 27 | 7.16 |
| 8. Correction/Self-correction | 19 | 5.04 |
| 9. Reply clarification | 18 | 4.77 |
| 10. Paralinguistic features | 33 | 8.75 |
| 11. Appeals for help | 11 | 2.92 |
| 12. Vocabulary request | 2 | 0.53 |
| 13. Reply vocabulary | 2 | 0.53 |
| 14. Vocabulary check | 0 | 0 |

1. Existing negotiate for meaning strategies

According to the table 2, it can be seen that the key informants have frequently used elaboration (18.30%), confirmation (15.40%), elaboration request (10.87), and reply elaboration (10.87%) in this study in order to discuss, solve the difficulties, and reach their goals in the FB discussion activities. The study findings are considerably in line with the findings of Samani, et al.'s study that confirmation, elaboration, and elaboration request, were used the most in their study [33]. The excerpts below are the examples of the negotiated interaction strategy found which the key informants produced while they were interacting in the FB. The underlined utterances are turn-takings which involved in each strategy found.

Excerpt 1 (Elaboration)

Student A: I agree with Ajarn. However, I would like to add more. For my perspective [...]

Student B: I agree with you because on the first paragraph you should give about your details.

Student C: Can anyone give me an example? I'm quite not clear about this part. I mean

As the excerpt 1 presents above, it is an elaboration strategy. Elaboration was used the most among other strategy. It can be seen that the student A, B, and C applied this strategy in order to add more details to the previous statements which belong to themselves. Moreover, it can also help to reduce the misunderstandings in their conversation as well.

Excerpt 2 (Confirmation)

Student G: I think the way that he gives the information of his experiences can build up the reader interest.

Student H: Yes, I just thought that way.

Student I: I couldn't agree more with you.

From the excerpt 2 above, a confirmation strategy, it was used the most when students wanted to confirm or agree with the previous statements. As it is shown above, the student H and I produced the utterances in order to confirm the previous statements as to agree with each other.

2. Additional negotiation for meaning strategies

Consequently, there are additional negotiated meaning strategies found in this particular medium which are paralinguistic features (8.75%), appeals for help (2.92%), vocabulary request (0.53%), and reply vocabulary (0.53%), respectively.

Basically, according to Brown, he defined the *paralinguistic features* as any aspects of spoken utterances "which contribute to the expression of attitude by a speaker and do not form an intrinsic part of the phonological contrasts which make up the verbal message" [34]; however, Indrova stated that languages used in the CMC becomes a new language which the users try to develop new ways to combine diverse features of paralinguistic as in a written form because they need to make the communication more direct and similar to the FTF interaction such as emoticons using such as ☺, ☹, :-O, and etc. in order to express the facial expresses, onomatopoeic words using such as ahhh, yeah, wooh, and etc. in order to express the sender's feelings or attitudes, and etc. [35]. Therefore, in this study, it includes emoticons using, abbreviations, onomatopoeic words, L1 using, and punctuation using. Secondly, it is *the appeals for help* strategy which was defined as any expressions indicating the speakers have some difficulties in understanding the messages [10]. Lastly, the vocabulary request and reply vocabulary were also observed in this study as well. According to Akayoglu & Altun, vocabulary request refers to the utterances which were produced in order to request for a vocabulary word or phrase; whereas, the reply vocabulary refers to the utterances that were produced in order to give a meaning of the requested vocabulary as a result of request [36]. Figure III shows the utterances that involve around these types of negotiated meaning collecting from this study.

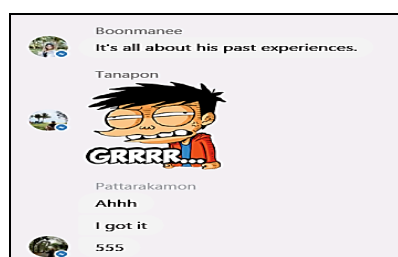


Figure III. Excerpt 3, A Paralinguistic feature

As it is shown in the Figure III above, the findings illustrate that Tanapon and Pattarakamon produced the paralinguistic features, especially the emoticons using, onomatopoeic words, and L1 use in this excerpt. Based on the excerpt above, Tanapon has used "*emoticons*" in order to express his feelings toward previous statements. In other words, an emoticon was used because there was a lack of non-verbal communication in this mean of CMC communication so he could not express his feelings through his face; therefore, he tended to use emoticon instead. Similarly, Pattarakamon also expressed her acknowledgement and understanding by producing "*Ahhh*", as it was categorized in "*an onomatopoeic word*" category [35].

In sum, it can be concluded that the negotiated meaning strategies were used by the key informants while they were interacting to each other via CMC interaction in order to achieve the discussion activities and also solve some difficulties in such conversations. However, in the study findings, there are 13 negotiated interaction strategies found which it is shown in the table 2 above. Therefore, it could be summarized that there are many factors affecting the negotiated interaction including different contexts or mediums, purposes of activities, group of participants, and etc. As a result, those factors influence the use of negotiated meaning strategies which it considerably differs from the previous studies.

B. Students' perceptions toward integrating FB into the ESP teaching and learning

In order to answer the second research question, the focus group interview transcriptions were used as a main data for this certain focus. The findings indicate that the ESP students perceived both Macro and Micro skills perceptions toward implementing CMC in the ESP teaching and learning practices. Findings indicate that the key informants perceived the positive effects of using the FB in the ESP teaching and learning methods more than the negative ones. The table 3 below presents the findings which were collected from the focus group interview.

Table 3. Students' perception found regarding macro and micro skills

| | Macro skills | Micro skills |
|---|---|--|
| Typical perceptions found from previous studies | <ul style="list-style-type: none"> • Reading skills • Speaking skills • Writing skills • Listening skills | <ul style="list-style-type: none"> • Critical thinking and analysis skills • Collaborative skills • Problem-solving skills • Self-regulated learning skills • Computer literacy and computing skills • Cognition and social skills |
| Perceptions found in this certain study | <ul style="list-style-type: none"> • Writing skills • Business writing skills • Reading skills | <ul style="list-style-type: none"> • Problem-solving skills • Ethnographic skills • Collaborative skills • Group working skills • Risk taking skills • Negotiation and deal with people skills • Communication skills |

In this study, findings from the focus group interview session reveal that integrating the FB or CMC into the ESP practices could facilitate the students' perceptions in both macro and micro skills. According to the table 3, it can be seen that, there are some additional perceptions which the students perceived in this particular study.

Regarding the macro skills perceptions, business writing skills are one of the crucial perceptions which the CMC can be used to employ and transmit these contents knowledge through the medium. As the students mentioned that they were able to write and organize the business document better after they have practiced both in the classroom and also in the CMC medium. Therefore, it, somehow, facilitates their writing skills and also the business writing contents as well. Moreover, they also stated that they have improved their reading skills through the CMC materials as well because they have to read the materials before they applied it in the tasks.

Regarding the micro skills perceptions, it can be concluded that the students perceived several micro skills perception toward using the CMC in the ESP practices; for example, problem-solving skills, negotiation, and communication skills and etc. According to the students' interview transcription, they proposed that they perceived a negotiation skill from the discussion activities on the FB, later they will be able to apply this skill in the future when they have to convince the customers. Thus, it benefits their professional domain in the future career. However, the students also mentioned and realized that different settings also affect the language used in such contexts; therefore, they need to consider the contexts before using the language as well.

However, regarding the suggestions from the students who participated in the focus group interview, they stated that there were some problems which educators

need to concern before integrating this medium into the ESP practices such as the internet connection and the students' disciplines and responsibilities; however, they perceived its convenience in using and contacting both their friends and lecturers are the benefits which they obtained from using FB in the study. Additionally, they also suggested that CMC interaction should not be used alone; they definitely need the FTF interaction as the main interaction in the teaching and learning practices.

Therefore, to conclude, integrating, interacting, and doing activities such as discussion or collaborative working on the FB could help and facilitate the students' perceptions in both macro and micro skills. Later, it effects, motivates, and influences better results in their learning process and outcomes.

V. CONCLUSION AND IMPLICATIONS

From the findings, it can be concluded for two main aspects. For negotiated meaning strategies, the participants in this certain context have used several negotiated strategies in order to negotiate, solve some problems, and reach the purposes of the conversation. Although there are a number of negotiated interaction types which have been used similarly to the previous studies, there are also some additional negotiated types which have been found in this particular context. Regarding the participants' perceptions, it was revealed that integrating the CMC medium, FB platforms, into the teaching and learning practices can enhance and facilitate both macro and micro skills perceptions of participants. Later, it helps and effects a better result in their learning process and outcomes. Therefore, this medium might be one of practical mediums that can be used to integrate into the teaching and learning process in order to facilitate them to learn and use the knowledge practically in the future.

As these certain findings were revealed, it could be used as one of the data which can address the gap of the interaction studies and discourse used in the ESP contexts. In term of students and educators, being able to use and being aware of these negotiated interaction strategies may facilitate and help to scaffold the ESP learners and their learning development as well. Additionally, this study also intends to explore the effects of online interaction toward the students' perceptions in the setting where English linguistics was taught along with the content knowledge of the professional domains, ESP; thus, this might be one of crucial data for educators to emphasize and consider the students' perception toward its usage before implementing into the teaching and learning methods.

VI. ACKNOWLEDMENT

The authors would like to thank Mae Fah Luang university in Chiang Rai, Thailand for providing financial support and facilities to carry out this study.

REFERENCES

- [1] Long, M. H. The Role of the Linguistic Environment in Second Language Acquisition. In W. Ritchie & T. Bhatia (Eds.), *Handbook of Second Language Acquisition*. San Diego: Academic Press. 1996.
- [2] Ellis, R. *Second Language Acquisition*. Oxford: Oxford University Press. 1997.
- [3] Long, M. H. Input, Interaction and second language acquisition, Ph. D. Dissertation. University of California: Los Angeles. Web link missing. 1980.
- [4] Zivkovic, S. The ESP Technology-Supported Learning Environment. *European Journal of Social Sciences Education and Research*, 6(1): 154-161. 2016.
- [5] Lungu, I. The Increasing Need for Blended-Learning Models in Courses of English for Specific Courses in Romanian Universities. *Social and Behavioral Sciences*, 76: 470-475. 2013.
- [6] Luzon, M. J. A theoretical framework for the design of online collaborative tasks for ESP. *ANGLOGERMANICA ONLINE*, 1-12. 2006.
- [7] Brown, H.D. *Teaching by Principles*. Prentice Hall. New Jersey. 1994.
- [8] Baker, M. A Model for negotiation in Teaching-Learning Dialogues. *JI of Artificial Intelligence in Education*, 5(2): 199-254. 1994.
- [9] Pica, T. Research on negotiation: What does it reveal about second language learning conditions, processes and outcomes? *Language Learning* 44(3): 493-527. 1994.
- [10] Champakaew, W. and Pencingkarn, W. The Effectiveness of Negotiation for Meaning Strategies on EFL Learners' Oral Proficiency Development in two-way Communication task. *The new English Teacher* 8.1, 80-101. 2013.
- [11] Loewen, S. *Introduction to Instructed Second Language Acquisition*. New York, NY: Routledge. 2015.
- [12] Hiltz, S. R., and Turoff, M. *The network nation: Human communication via computer*. Norwood, NJ: Ablex. 1978.
- [13] Romiszowski, A. J., & Mason, R. Computer-mediated communication. In D. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 438–456). New York: Simon & Schuster Macmillan. 1996.
- [14] Warchauer, M. Computer-mediated collaborative learning: Theory and Practice. *The Modern Language Journal*, 81(4): 470-481. 1997.
- [15] Warschauer, M. Online-communication. In R. Carter, & D. Nunan (Eds.), *The Cambridge guide to Teaching English to Speakers of other languages*. Cambridge: Cambridge University Press. 2001.
- [16] Hosseini, S. B. Computer-Mediated Communication: Pedagogical and Language Learning Implication. *International Journal on New Trends in Education and their Implications*, 6(1). 2015.
- [17] Shih, R. C. Can Web 2.0 technology assist college students in learning English writing? Integrating Facebook and Peer assessment with blended learning. *Australasian Journal of educational Technology*, 27(5): 829-845. 2011.
- [18] Tarentino, J., & Graf, K. In the classroom: Using Facebook in the language classroom as part of the net generation curriculum. *The language educator* November 2011. 2011.
- [19] Worajittipol, K. Online interaction between Thai EFL learners and English speaking chat partners: an exploration of negotiation for meaning and developing relationships. Doctoral dissertation. Retrieved February, 10, 2016, from Dissertations and Theses database. (UMI No. 3413193). 2010.
- [20] Liu, Y. Social media tools as a learning resource. *Journal of Educational Technology Development and Exchange*, 3(1): 101-114. 2010.
- [21] Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, 30(3): 227-238. 2009.
- [22] Perception [Def.1]. *Yourdictionary.com*. In Webster's New World College Dictionary. Retrieved December 15, 2016, from <http://www.yourdictionary.com/perception>. 2010.
- [23] Al-Shehri, S. Connectivism: A new pathway for theorising and promoting mobile language learning. *International Journal of Innovation and Leadership on the Teaching of Humanities*, 1(2): 10-31. 2011.
- [24] Suthiwartnarueput, T., & Wasanasomsithi, P. Effects of using Facebook as a medium for

- discussions of English grammar and Writing of Low-Intermediate EFL students. *Electronic Journal of Foreign Language and Teaching*, 9(2): 194-214. 2012.
- [25] Jendrych, E. Development in ESP teaching. *Studies in Logic, Grammar, and Rhetoric*, 34(47): 43-58. 2013.
- [26] Brown, H. D. *Teaching by principles: An interactive approach to language pedagogy*. White Plains, NY: Addison-Wesley. 2001.
- [27] Cain, D. L., & Pitre, P. E. The effects of Computer Mediated Conferencing and Computer Assisted Instruction on student learning outcomes. *Journal of Asynchronous Learning Networks*, 12(3-4): 31-52. 2003.
- [28] Northcote, M., & Kendle, A. Informal online networks for learning: Making use of incidental learning through recreation. Paper presented at the International Education Research Conference, December 2–6, Fremantle, Australia. Retrieved from <http://ro.ecu.edu.au/ecuworks/4882/>. 2001.
- [29] Paechter, A., & Maier, B. Online or Face-to-Face? Students' experiences and preferences in e-learning. *Internet and Higher Education*, 13: 292-297. 2001.
- [30] Torii-Williams, E. Incorporating the use of E-mail into a language program. *Computer assisted language learning*, 17(1): 109-122. 2004.
- [31] Herring, S. C. Computer-mediated discourse analysis: An approach to researching online behavior. In Barab, S. A., Kling, R., & Gray, J. H. (Eds.). *Designing for Virtual communities in the service of learning*. New York: Cambridge University Press. 1995.
- [32] Herring, S. C. Computer-mediated Discourse. In D. Schiffrin, D. Tannen, and H. Hamilton (Eds.), *The handbook of discourse analysis*. Oxford: Blackwell. 2001.
- [33] Samani, E., Nordin, N., Mukundan, J., & Samad, A. Patterns of Negotiation of Meaning in English as Second Language Learners' interactions. *Advances in Language and Literary studies*, 6(1): 16-25. 2015.
- [34] Brown, Gillian (1990). *Listening to spoken discourse*. 2nd edn. London: Longman. 1990.
- [35] Indrova, T. Spoken, Written and Computer Mediated Communication: The Language of Online Discussion Forums. Retrieved from https://is.muni.cz/th/331015/ff_b/Indrova_Tereza-Spoken_Written_and_Computer-Mediated_Communication.pdf. 2011.
- [36] Akayoglu, S., & Altun, A. The Functions of Negotiation of Meaning in Text-Based CMC. In R. de Cássia Veiga Marriott, & P. Lupion Torres (Eds.) *Handbook of Research on E-Learning Methodologies for Language Acquisition*, 291-306. Hershey, PA: Information Science Reference. 2009.

Service Quality in Public Sector Toward Surabaya Multi Media City (Case Study: Broadband Learning Center Services in Taman Prestasi, Surabaya City)

¹ Sri Muryani, ² Prasasti Anjarwani, ³ Luluk Dwi Sasmita, ⁴ Wildan Taufik Raharja

^{1,2,3} Student of Public Administration, Hang Tuah University, Surabaya, Indonesia

⁴ Lecturer of Public Administration, Hang Tuah University, Surabaya Indonesia

E-mail: ¹yaniani272@ymail.com, ²anjarwani25@gmail.com, ³ldsasmitaa@gmail.com, ⁴wildantraharja@gmail.com

ABSTRACT

In order towards Surabaya Multi Media City, local government of Surabaya City launched Broadband Learning Center (BLC). It is one of Surabaya Local government's concerns to develop information and technology. Furthermore BLC is an effort to actualize the national goals, especially in order to educate the life of the nation and encourage the growth of innovations in education systems based on technology and information. In 2013, BLC was nominated in the FutureGov Awards in Thailand after successfully outperforming the advanced countries that have been favored in the field of information technology such as Singapore, Australia, China, Hong Kong and India. Based on reports on the number of visitors, there is a decrease in number of visitors at BLC from year to year. Furthermore, the facilities of BLC have not improved. It will be concern in this study to know the public service quality of BLC. The research problem is how the service quality of Broadband Learning Center in Taman Prestasi, Surabaya City.

The purpose of the research is to describe the service quality of Broadband Learning Center in Taman Prestasi, Surabaya City. To answer the research question, the study used public service quality theory that consist 5 components, named Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The research method was descriptive qualitative with case study research. Then the technique of data collection used observation, interviews and documentation. Furthermore, the technique of validity checking of the data used triangulation method. Data analysis technique used 6 stages of qualitative research based on data analysis approach consisted of managing and preparing data, reading the whole data, analyzing more details and recoding the data, applying the coding process, presenting the data, and interpreting data. Based on observation and analysis of data that have been interpreted by theories, the research can be inferred that the service quality of Broadband Learning Center is good, but there are some components that must be improved, especially components of tangible and empathy. In the tangible component, they have to improve facilities and infrastructures. then, component of empathy, they should training the instructor to serve more wholeheartedly.

Keywords: Public Service, Public Service Quality, Broadband Learning Center

I. INTRODUCTION

Service quality of internal customers has an impact on external customers, although in many cases, employees might never have direct relationship with them by Safdar Nazeer [10]. The highest quality means the best satisfaction of consumers' preferences, Yarimoglu [4]. service quality in public sector has been traditional hierarchy system, they have to focus on customers like private sector, and receive customer-oriented innovation, Hsiao and Lin [3]. Service of public sector customer consists of all actions which is conducted by the organization to obtain customer satisfaction and help to acquire the most value products and services that have been purchased, Hadiyati [5].

Dimensions of service quality such as Tangibility, Reliability, Responsiveness, Empathy and Assurance significantly predict customer commitment

and trust, Lohani and Bhatia [8]. Tangible is the most important dimension in examining the level of service quality, expectation and perception of the external customers towards the Malaysian public services, Ilhaamie [1]. Dimension of reliability were the most critical area of improvement for the agency toward customer service quality in a public agency in Malaysia, Hashim, et al. [6]. Improvement in service quality can enhance customer loyalty and the service quality dimensions that play a significant role in this equation are reliability, empathy, and assurance at Bank in Penang, Malaysia, Kheng [7]. Service quality in Immigration Office in Indonesia, the lowest element of service is speed of service, Hadiyati [5].

Surabaya is the capital city of East Java with a fairly high population. The economic activity are mostly in the sector of trades, services, industry and transportation especially becoming the traffic congestion for the eastern part. As information and

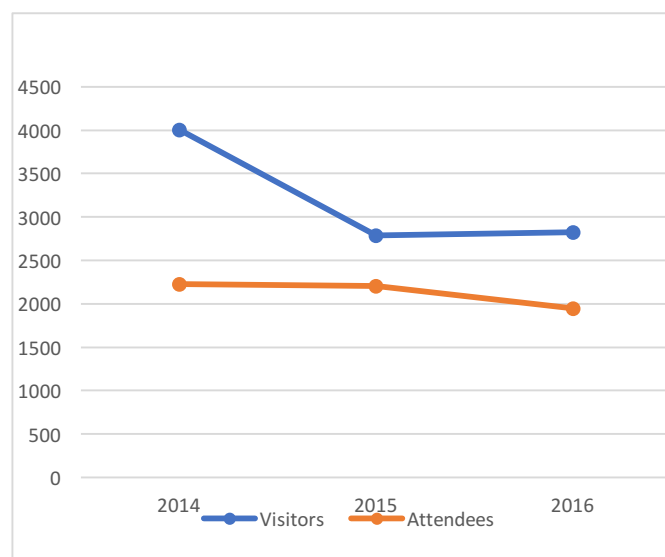
technology are developed, the economic activities of society also starts to utilize technology, especially in terms of marketing. In accordance with the Law of the Republic of Indonesia concerning Information and Electronic Transactions Number 11 of 2008 on Chapter II article 4 stated that: The utilization of Information Technology and Electronic Transactions is carried out in order to: a) educate the nation as part of the world information society; B) develop trade and national economy in order to improve the welfare of the people; C) improving the effectiveness and efficiency of public services; D) open the widest opportunity to any person to advance their thinking and ability in the field of use and utilization of Information Technology optimally and responsibly; And e) provide security, fairness and legal certainty for users and providers of Information Technology.

In order to realize the wants and needs of the people of Surabaya on the importance of learning resources in the learning activities, Surabaya City Government cooperates with PT Telkom Indonesia building "Broadband Learning Center" (BLC) in certain number of areas, one of them is in Taman Prestasi Surabaya. The BLC was built as a learning resource center to realize the importance of information technology and as an effort to accelerate towards Surabaya "Multi Media City".

Along with the innovation of public service through BLC, the Mayor of Surabaya Tri Rismaharini received an international award at Angsana Laguna Phuket, Thailand in a brief submitted through futuregov nomination, in the category "Data Center" which mentions that the Surabaya Municipal Government has conducted innovation, efficiency and superiority in the management of projects around the data center. But in the last 3 years, the use of BLC tends to decrease, this can be seen from the following table.

From the Figure 1, it can be seen that visitors of BLC at Taman Prestasi in the last three years tend to decline starting from 2014, BLC visitors were 4008 and decreased to 2787 in 2015. The decrease in the number of visitors also implicate the BLC participants, i.e in 2014 the number of participants in total of 2229 decreased to 2205 in 2015, and in 2016 it decreased to 1944. Based on the problem statement above then the formulation of the problem in this study is how id the quality of service BLC in Taman Prestasi Surabaya. Then the purpose of this study is to describe the quality of service provided by BLC in Taman Prestasi of Surabaya

Figure 1. Total of BLC Attendees and Visitors at Taman Prestasi



Source: Surabaya Information and Communication Departement

II. THEORITICAL FRAMEWORK

AS. Moenir (2002) defines "service as an activity undertaken by a person or group of people on a particular basis where the level of satisfaction can only be felt by the person serving or served, depending on the service provider's ability to meet user expectations." Service is essentially a series of activities, Therefore the service process takes place on a regular and continuous basis, covering the entire life of the organization in society. The intended process is carried out in relation to the mutual fulfillment of needs between the recipient and the service provider.

The definition of public according to Inu Kencana Syafii, et al (1999) is "A number of people who have correct and good togetherness thinking, feelings, expectations, attitudes and actions based on the values of the norms they have. Another sense comes from the opinion of the U.S. Moenir (1995) states that: "Public service is an effort made by a group or a person or bureaucracy to provide assistance to the community in order to achieve a certain goal".

Goetsch and Davis translated by Fandy Tjiptono makes the following definition of quality: "Quality is a dynamic condition associated with products, services, people, processes, and environments that meet or exceed expectations" (2001) According to Parasuraman A, Valarie A Zeithaml & Leonard L. Berry [9], there are several criteria that become the basis of consumer assessment of services such as:

- a. Direct evidence (tangible), including physical facilities, equipment, employees and means of communication.
- b. Reliability, namely the ability to provide services promised immediately, accurately and satisfactorily.
- c. Responsiveness, namely the desire of the staff to assist customers and provide responsiveness services.
- d. Assurance includes knowledge, skills and credibility of staff free from harm, risk and doubt.
- e. Empathy, encompassing the ease of communicating unique relationships, individual attention, understanding the needs of customers, Tjiptono [13]

III. METHODOLOGY

This study uses paradigms or advocate assumptions of philosophy and participatory. The research, the researcher implements inductive study and focused on individual values. The research strategy used in this research is the case study. Robert K Yin [14] defines how a case study is a scientific study that investigates a phenomenon of unclear context.

Data is the result of typical events that are stated as facts in the form of measurement results. Data may be in a form of facts, numbers, graphs, and other forms that explain an idea, object, condition, and situation. The data in this research are primary data and secondary data. Primary data were obtained from interviews and observations, while secondary data were obtained through document search related to the study. Data collection was obtained through field observation, interviews, and documentation. Informants in the study were chosen purposively, meaning that individuals who become subjects were selected as needed. The activity of collecting research subjects began with observation in the research area. The main consideration determining informants, is the mastery of information and data that the researcher needed. The informants in this study is the community of BLC service users and BLC employees.

Then the data collection technique in the research was using observation, interviews and documentation. In order for a qualitative study to be accountable practically and scientifically, it is necessary to verify the validity of data, the technique of verification of soft data in this research is the method of modulating. While data analysis used 6 stages of qualitative research data approach consisting of managing and preparing data, reading the entire data, in-depth analysis and data coding, applying coding processes, presenting data, and interpreting data.

IV. DISCUSSION

Broadband Learning Center is a free computer and internet learning tool for residents of Surabaya City as an effort to educate the life of the nation and encourage the growth of various innovations in the education system. The major changes that occur in the global environment requires Surabaya City Government to develop a more open, flexible, qualified and accessible education system to anyone who needs it regardless of age, gender, location, socio-economic conditions, and previous educational experience. In cooperation with PT Telkom Regional Division (Divre) V East Java, Surabaya City Government has established 23 BLC until 2015 and spread in the strategic point of public services in the city of Surabaya.

- a. Tangibles (physical evidence); Covering physical facilities, equipment, personnel and communication facilities and operational vehicles. Thus direct evidence / form is one of the most concrete indicators. Its forms are all facilities visible to users. In BLC Taman Prestasi, the government has provided sufficient and useful facilities. Facilities and infrastructure available at BLC Taman Prestasi have met good service standards, for example:

- 1) PC pentium 4 and its accessories are available 10 units
- 2) AC with good condition 2 units
- 3) White board 1 unit
- 4) Bookcase or other equipment 1 unit
- 5) Printer to print user works 1 unit
- 6) Dispenser and its contents 1 unit
- 7) Speaker located on each PC table
- 8) Lcd / Projector for learning 1 unit
- 9) Teaching Table 1 unit
- 10) Complete hygiene tools available
- 11) Clean and fragrant available toilets

There are two instructors available, who are also graduates from reputable universities, and graduates of appropriate majors. But the quality of facilities and infrastructure of the last 5 years there has been no renewal.

- b. Reliability; is the ability to provide promptly and satisfactorily promised service. According to Lovelock, reliability to perform the promised service dependably, this means doing it right, over a period of time. That is, reliability is the ability of companies to display promised services in a precise and consistent manner. Reliability can be interpreted to work properly until a certain time. The fulfillment of an appropriate and satisfactory service pledge includes the timeliness and competence in

responding to customer complaints and providing reasonable and accurate service.

In visitor service, the Instructor in charge of BLC Taman Prestasi is a graduate from the IT department, thus there is no doubt in comparing the ability and reliability when teaching applications to BLC Taman Prestasi users. There is a fairly clear schedule in BLC, so participants can choose the time correctly to attend courses at BLC. In its implementation, the training at BLC is in accordance with the available schedule. The consistency of schedules and materials in the training make the BLC user trust better

- c. Responsiveness; Including the Instructor's response attitude in providing needed services and can complete quickly. The speed of service provided is the responsiveness of the officers in providing services needed. This responsiveness is a consequence of the mind and mind shown to the user. Instructors in BLC Taman Prestasi is still said to not serve the visitors well. Just like when users are busy, causing the instructor to be less responsive when one or two people ask, because for the instructor the common interest is the precedence.
- d. Assurances; Including knowledge, competence, courtesy and credibility of the employee, free of danger, risk and doubt. Guarantees are the safeguards presented to the public to its citizens against the risks which, if they occur, will result in disruption in the normal life structure. Regarding protection guarantees through BLC Taman Prestasi, users who ride vehicle will certainly be safe even though the parking lot of the vehicle is very minimal. But with the parking attendant, users do not have to worry about the vehicles they ride, because it is certainly safe.
- e. Emphaty; Including ease of connecting, good communication and understanding of user needs. Empathy is individualized attention to customer. Empathy is a personal or individualized concern for the user by putting himself in the user's situation. In the sense of instructors assigned at BLC Park Achievement is less giving empathy to each user, because for the instructor the common interest is the main. Therefore instructors are less concerned about the needs, or needs of each individual. This is because of the number of instructors

VI. CONCLUSION

The quality of community services is a very important factor and determines the success of public

service delivery. It is because the community is the customer of the products that they produce. Customer satisfaction implies an emotional judgment from the customer after they use a product, in which needs and wish is fulfilled.

Based on observation and analysis of data that have been interpreted by theories, the research can be inferred that the service quality of Broadband Learning Center is good. The quality of service provided by the instructor / employee of BLC at Taman Prestasi of Surabaya City is good enough to fulfill the excellent service. BLC Taman Prestasi can be regarded as one of the facilities provided by the government that meet the excellent service standards. But there are some components that must be improved, especially components of tangible and empathy. In the tangible component, they have to improve facilities and infrastructures. then, component of empathy, they should training the instructor to serve more wholeheartedly.

REFERENCES

- [1] A. G. A. Ilhaamie, Service Quality in Malaysian Public Service: Some Findings, *International Journal of Trade, Economics and Finance*, Vol. 1, No. 1, June, 2010
- [2] Creswel, Jhon W. *Research design*. Yogyakarta: Pustaka Pelajar. 2013
- [3] Chih-Tung Hsiao and Jie-Shin Lin, A Study Of Service Quality In Public Sector, *International Journal of Electronic Business Management*, Vol. 6, No. 1, pp. 29-37, 2008
- [4] Emel Kursunluoglu Yarimoglu1, A Review on Dimensions of Service Quality Models, *Journal of Marketing Management*, June 2014, Vol. 2, No. 2, pp. 79
- [5] Ernani Hadiyati, Service Quality and Performance of Public Sector: Study on Immigration Office in Indonesia, *International Journal of Marketing Studies*; Vol. 6, No. 6; 2014
- [6] Hadzeri Hashim et.al, Customer Service Quality in A Public Agency in Malaysia: Towards A Customer- Focused Public Organization, *Australian Journal of Basic and Applied Sciences*, 5(9): 1777-1783, 2011
- [7] Lo Liang Kheng et al, The Impact of Service Quality on Customer Loyalty: A Study of Banks in Penang, Malaysia, *International Journal of Marketing Studies*, Vol. 2, No. 2; November 2010

- [8] Maya Basant Lohani and Pooja Bhatia, Assessment of Service Quality in Public and Private Sector Banks of India with Special Reference to Lucknow City, International Journal of Scientific and Research Publications, Volume 2, Issue 10, October 2012
- [9] Parasuraman A, et al. Berry," Reassessment of Expectation As A Comparison Standart In Measuring Servive Quality: Implications For Futher Research", Journal Of Marketing, Vol 58, 1994
- [10] Safdar Nazeer et al. Internal Service Quality and Job Performance: Does Job Satisfaction Mediate? Journal of Human Resources Management and Labor Studies March 2014, Vol. 2, No. 1, pp. 41-65
- [11] Strauss,A.,&Corbin,J. *Basic of Qualitative Research:Grounded theory procedures and Techniques*, Newbury Park,CA:Sage-Publications,Inc. 1990
- [12] Tjiptono, Fandi. *Manajemen Jasa*. Yogyakarta : PT. Andi, 1986.
- [13] Tjiptono, Fandi, 1997. *Prinsip-prinsip Total Quality Service*. Yogyakarta : PT. Andi
- [14] Yin, Robert K. Case Study Research: *Design and Methods Foruth Edition*. Londong : Sage Publication Inc, 2009.

Images of Javanese Women in Patriarchal Culture Represented by Aisyah, a Character in Umar Kayam's *Para Priyayi*

Potret Perempuan Jawa dalam Budaya Patriarki melalui Tokoh Aisyah dalam Novel *Para Priyayi* Karya Umar Kayam

Sri Warsidah Rahmi

Student of Humanities Faculty, Universitas Indonesia, Depok, Indonesia

E-mail: sriwarsidahrahmi@yahoo.com

ABSTRACT

This study uses a gender perspective, a concept used to review the role between men and women constructed by culture. Culture that has been inherent in the society that is patriarchal culture resulted in the role of women always reside in the domestic territory. The patriarchal culture can be found in Javanese culture. This research uses descriptive analysis method. From the analysis, this research shows 1) the description of the role acted by Aishah figure as Javanese woman always in domestic area, 2) perspective of Aisyah figure as a wife in environment that embraces patriarchy culture shows his acceptance of 3 basic duties of Javanese women namely; Masak (Cooking), Macak (Dressing Up), and Manak (Giving a birth).

Keywords: Gender, Patriarchy, and Javanese Culture

I. INTRODUCTION

Literary work is a creative process of an author, which produces an idea, concepts and ideas that take the theme exists among society. This creative process makes the public (reader) feel that the literary works created by the author, describe his own life, although the picture of life is based on the imagination made by the author. Literary works convey "understanding" of life in its own way [1]. Literary work represent wide range of discourse, from personal behavior to Cultural problem.

One of the discourses represented by literary works is the emergence of patriarchal culture. This patriarchal culture is a form of discrimination that women accept on the basis of customs and religion [2]. This culture says that women should be controlled by men. In doing something, women have to ask permission first for men, so they can run their activities or work. A system of male authority which oppresses women through its social, political and economic institutions [3].

The given system can appear in many forms, one of which is culture. Culture can be a male authoritative institution against women. One of the culture that embraces patriarchy is Javanese culture. In the context of Javanese culture, patriarchal culture shapes women to be obedient and devoted to their husbands.

Talking about women's portraits, especially Javanese women, it is closely related to the myriad of manners that accompany it. The view that women should be a devoted, faithful, and gentle has been embedded in social life in Java. This view is reinforced by the *priyayi* culture adopted by most Javanese families of the upper class (*keraton*),

especially the people residing in the area around the palace. Culture and values within a society that have been shaped in such manner create the roles division between men and women in which the public role is played by men while the domestic role is handled by women. The public role played by a male produces a material or position that earns him a superiority. While the role of women who do not earn money or position place them in an inferior position.

The superior and inferior classification is what causes some men to underestimate the status of women as housewives. Women's tasks that are limited to domestic areas are often underestimated. It is this viewpoint that causes the status of the housewife to be increasingly underestimated. The cultural heritage maintained in the community, often positioning women as complementary, makes women afraid to speak out the rights women deserve. Such superficial thoughts led to patriarchy flourishing in Java. Representing the public's assumption that the nature of women must honor husband. To marry a husband is a duty to a wife, but it is wrong when the wife's compliance is overwhelmed by oppression and violence from her husband.

In literary work, it is possible that a writing takes the background of Javanese culture and utilize above Javanese women's phenomenon to represent the female Javanese characters in his work. One example of literary works that use the background of Javanese culture is the work of Umar Kayam *Para Priyayi*. It is important to see the story through the perspective of a wife as part of the characterizations depicted. A wife that is faithful and constantly accompanying her husband. Women who start her life in *Priyayi*

households. Through her point of view the researcher will describe how Kayam portrays the ideal woman of Java undergoing her role as a wife. Therefore this research will discuss; 1). The role of Aishah as a Javanese woman in Umar Kayam's novel *Para Priyayi*, 2) Perspective of Aishah as a wife is under the patriarchal culture system.

In line with the above problem formulation, the purpose of this study are; 1). Knowing the role played by Aishah as a Javanese woman in Umar Kayam's *Priyayi* novel, 2) to know Aisha's perspective as a wife who is in an environment that embraces patriarchal culture.

Theoretically this research will contribute in to the science of literature especially in analyzing the literary works using the perspective of gender and patriarchal culture. Not only that, practically this research will broaden reader's insight in understanding gender and patriarchal culture, especially in Javanese cultural background

II. LITERATURE REVIEW

A. Gender

Gender is a term in social science used by Ann Oakley to analyze and understand the issue of discrimination against women. The term gender is also used to describe how men and women differ socially. Gender is also interpreted as a concept of social relationships that separate men and women in their functions and roles. The differences in function and role between men and women are not determined by biological or natural distinctions but on the basis of their position and function and role in different areas of life [4]. Oakley explains:

‘Sex’ is a word that refers to the biological differences between male and female: the visible difference in genitalia, the related difference in procreative function. ‘Gender’ however is a matter of culture: it refers to the social classification into ‘masculine’ and ‘feminine’. [5]

Thus, the division of roles between men and women that occurred during this is a cultural construction. A construction that is traditionally handed down from generation to generation. This tradition has been inherent in society that results in outward acceptance. Similiar to the opinian above, Corbett says that:

Sociocultural gender is not a matter of the sexual division of people into female and male as such, what people typically mean by

“natural’ gender, but of the significance attached to that division, the institutions and ideologies, the prescribed and claimed identities, and the array of social practices that sustain those institutions, ideologies, and identities (2014: 3).

The gender concept is utilized to break away from the traditional view of the division of roles by sex. The gender concept reconstructs the position and role between men and women in social practice, thus opening up balanced opportunities regardless of gender, male and female differences

B. Patriarchy and Javanese Culture

Patriarchy comes from the word patriarchate which means placing the male role as the sole ruler of all things. So, it can be stated that patriarchal culture is a culture built on the basis of hierarchy of domination and subordination that requires men and men's view to be a norm [6]. While Humm explained that patriarchy is a system of male authority that oppresses women through social, economic, and political institutions (1990:159).

As a culture, the Patriarchy establishes the opinion that men are always superior to women. The longstanding and continuous patriarchal culture has resulted in the division of the roles of women and men in many areas of life to be unjust and unbalanced.

This phenomenon can be observed in Javanese culture. In the Javanese culture, many terms affirm the inferiority of women before men, for example in the Javanese term wife as *Kanca Wingking* means friend behind. A term that indicates that women are only in charge of managing household affairs, especially child care, cooking, and washing [7].

The role of wife in Javanese culture by Fauzan explained that the philosophy of Javanese women and their duties in the household are three namely; *Masak*, *Macak* and *Manak*. *Masak* is related to the kitchen affairs, doing housework. *Macak* is ornamented that is meant to dress up or look beautiful in front of the husband. While *Manak* is giving birth to offspring (2013: 24). Of the three Javanese women's philosophies, can be seen clearly how the position of women placed all day centered at home. The concept defines the position of women whose lives are centered at home and husband.

Both statements above affirm the role and position of women who are limited in the domestic sector. In the Javanese culture the role is a form of a submission toward man (father or husband).

III. RESEARCH METHOD

This research is a qualitative research on Umar Kayam's novel *Para Priyayi*. Descriptive method of analysis will be used in this study, which according to Arikunto (2010: 151) is a method of data collection by finding related supporting factors to the research with the aim of connecting these factors with research results [8].

This study uses a gender perspective to review the roles between men and women. To that end, this study looks at the role acted by one of the female characters (Aisyah) in the novel. The data in this study were obtained from Umar Kayam's novel *Para Priyayi* in the form of text such as; words, sentences and paragraphs related to the object of research.

IV. FINDINGS AND DISCUSSIONS

In the novel *Para Priyayi*, portraits of women working in public sphere seem hard to find. Kayam describes the Javanese woman who acts as the wife of a Priyayi by representing it through Aisha's character (*Dik Ngaisah*). In accordance with the background described which is the Javanese culture, this novel contains the philosophy of Javanese women to describe the daily life of *Dik Ngaisah* in novel *Para Priyayi*; *Masak*, *Macak* and *Manak*. Cook is related to the kitchen affairs, doing housework. *Macak* is ornamented that is meant to dress up or look beautiful in front of the husband. While *Manak* is giving birth to offspring. In the novel, *Dik Ngaisah* does his duty as a wife.

A. Doing housework and husband's needs

Dik Ngaisah is described as a wife who was ready to accompany a husband to start building a family labeled Priyayi. Through the commentary of the figure Sastrodarsono who is her husband, confirmed that the wife of a priyayi should be prepared and educated to be agile in taking care of household and husband needs. Even in the case of having a servant, a wife remains demanded to take care of or lead the maids in the kitchen. Here is the quote:

Dik Ngaisah, Alhamdulillah adalah istri seperti yang saya harapkan semula. Ia adalah perempuan yang agaknya memang sudah disiapkan orangtuanya untuk menjadi istri yang mumpuni, lengkap akan kecakapan dan keprigelannya. Di dapur ia tidak hanya tahu memasak, tetapi juga memimpin para pembantu di dapur (Umar Kayam, 2012: 49).

Dik Ngaisah, Alhamdulillah is the wife as I expected. He is a woman who seems to have been prepared by his parents to be a qualified wife, complete with skills and *keprigelannya*. In the kitchen, she not only knew cooking, but also led the maids in the kitchen. (Umar Kayam, 2012:49).

As a wife, *Dik Ngaisah* represents an acceptance in serving the daily needs of a husband by taking care of household chores. This can be seen through the following quotation:

Bukankah itu pembagian kerja saja antara saya dan bapak mereka? Bapak sudah membanting tulang mencari nafkah, saya yang ada digaris belakang mengurus semuanya agar ada dalam keadaan beres. Kalau sampai tidak beres, bapake tole bingung dan marah-marrah, bisa kacau dia bekerja (Umar Kayam, 2012: 230).

Is not that a division of labor between me and their father? Daddy has toil for a living, I have a back line to take care of everything to be in a state of course. If it goes wrong, bapake tole is confused and angry, it can mess up he works (Umar Kayam, 2012: 230).

Through above quotation, it can be infer that *Dik Ngaisah* as a wife already understand his role. He accepted his work taking care of household needs as well as the needs of her husband. *Ngaisah* thinks of it as a proper division of tasks. Taking care of the back line indicates the kitchen needs to be well managed to meet the expectations of the husband.

As a woman *Dik Ngaisah* is described that she has been accustomed to always be ready to be at home. While a husband has the freedom to socialize with neighbors and the surrounding community in Wanagalih through the morning stroll routine. It is unnecessary to take a wife in the routine. It can be concluded that a woman's routine is always preparing for the needs of husbands in any situation including breakfast in the morning. This can be seen in the following quotation:

...sebentar lagi jam 5 pagi. Dan itu berarti jam kebiasaan saya untuk bangun menyiapkan kopi, makanan kecil pagi, air hangat, dan sarapan pagi, sementara bapaknya tole jalan-jalan pagi ke alun-alun (Umar Kayam, 2012: 229).

... It's going to be 5 am. And that means my habitual hour to wake up preparing coffee, morning snacks, warm water, and breakfast, while Tole's (name of their son) father does morning walk to the square (Umar Kayam, 2012: 229).

In addition to the image that has become the habit of a wife in doing his duty, Kayam also includes sincerity in serving the husband. The following quotation emphasizes that in doing the job there is no burden of feeling let alone become a compulsion. Precisely, this is a satisfaction to do the job of taking care of husbands.

... saya mesti turun mengawasi bukankah semua itu untuk kesenangan suami dan saya sendiri? (Hal. 229).

... I should go down to watch that, is not all for the pleasure of my husband and myself? (Umar Kayam, 2012: 229).

In the context above, Dik Ngaisah who has a housekeeper still supervise his assistant in preparing the needs of his husband such as coffee, warm water and small meals in the morning. The work has been done by Dik Ngaisah for many years and has never been bored to keep an eye on his maid. He worried that if not supervised the results will not be satisfactory.

In addition to serving the husband, the tradition of preparing food for the guests is also done by the wife. It became the habit of Ngaisah. As a good wife, she greets guests but not by welcoming at the door, yet she prepares the dishes to impress the guests. Here is the quote:

Istri saya jauh hari sudah repot membenahi rumah dan halaman. Juga pada waktu tamu saya itu datang, istri saya sudah siap sedia menyediakan macam-macam penganan dan santapan yang tentu saja dia harapkan akan dapat mengesankan para tamu (Umar Kayam, 2012: 75).

My wife is already busy to fix the house and the yard. Also when my visitor arrived, my wife was ready to provide all kinds of snacks and meals that she hoped would impress the guests (Umar Kayam, 2012: 75).

So it is clear how all household affairs related to the kitchen has always been the work of a wife, not a husband. Thus, Dik Ngaisah is a portrait of a woman

who is obedient to her husband, for doing all the housework without complaining about the division of tasks. The division of tasks that are culturally meant women already understand their duties and are educated to be ready for the role.

B. *Dress up or decorate for a husband*

The second task a wife has to do is beautify herself. Beautify yourself not only in the sense of wearing lipstick and talcum but also means caring for the body. Likewise, with *Dik Ngaisah* who always painstaking in caring for the body. He felt that it was natural to take care of the body to please the husband.

"..... kadang-kadang ada juga istri yang tidak cukup pintar menjaga kewanitaannya ... Maksud saya tidak telaten menjaga tubuhnya, baunya, keluwesan dan *kegandesan* sikapnya dan tindak tanduknya. Suami akan selalu senang dan kerasan dengan istri yang telaten menjaga semua itu... seringkali adalah suami yang menetapkan bagaimana mestinya kewanitaan kami itu" (Umar Kayam, 2012: 230).

"..... .. sometimes there is also a wife who is not smart enough to keep her feminine ... I mean careless to her body, its smell, manner, stance of attitude and its behavior. The husband will always be happy and at ease with his patient wife to keep with those attitudes ... the husband often the one who establishes how our feminine should be (Umar Kayam, 2012: 230).

In the above quote the male dominance of the female body is seen clearly. How women should take care of the body is not for their own sake, but for the sake of the husband. A wife should look beautiful for the husband's pleasure. In other words, the female body is completely regulated by men.

C. *Giving a birth*

In the novel *Para Priyayi*, *Dik Ngaisah* fulfills his duties as a Javanese woman who has to bear offspring. In the following passage, it is explained that He had given birth to two sons and one daughter whom they craved would be the successor of the *Priyayi* family.

"Anak-anak kami lahir dalam jarak dua tahun antara yang seseorang dengan yang lain. Noegroho lahir dua bulan sesudah kami pindah di Wanagalih" (Umar Kayam, 2012: 56).

“Our children are born within two years between one child to another. Noegroho was born two months after we moved to Wanagalih” (Umar Kayam, 2012:56)

Their first child is Noegroho's. The firstborn son after they live at the house which is located in Wanagalih. Two years after it was born Hardojo ago Seomini as the youngest child. *Dik* Ngaisah perfect his role as a woman.

By looking at the portrait of Javanese women who play the role of a Priyayi's wife, it is clear that women are still within the cultural boundaries that restrain women's space. Women are still in the realm of the back line. Kayam shows an ideal woman who is devoted to her husband without any protests or dissatisfaction with the treatment. Described that the division of tasks or roles that exist, is an absolute thing to do and not a thing that needs to be protested.

In Ngaisah's description above, it can not be classified into oppression. Ngaisah represents a woman who is aware of her role and accepts her nature as a woman. Regardless of their potential, the culture prevailed at that time seemed to lead women to accept their natures whose space is limited only at home unless there is a need with a husband. Kayam presents a receptive, sincere and happy woman side to devote herself to her husband and does not demand to have freedom or perhaps more precisely. Ngaisah does not feel constrained by all her routines centered solely at home.

V. CONCLUSIONS

By looking at the image of Javanese women in the novel *Para Priyayi*, it is seen how the representation of an ideal Javanese woman. This has been proven through the portrait of the wife of Sastrodarsono (*Dik* Ngaisah) who is very faithful to accompany her husband. Sincerely, he accepted his role as a woman and fulfilled the philosophy of the Javanese women's duties: Cook, Macak, and Manak. It shows how the representation of Ngaisah as a Javanese woman does not see the limits of women in the public sphere as a problem. Ngaisah submissive and obedient to her husband, Make the view of the husband as a reference and see it as something that is natural. In the context of patriarchal culture, women are created to always obey and serve their husbands.

REFERENCES

- [1] Budianta, Melani et al. “Membaca sastra”. Magelang: Indonesia Tera, 2003.
- [2] Fakhri, Mansour. “Analisis gender dan transformasi sosial”. Yogyakarta: Pustaka Pelajar, 2003.
- [3] Humm, Maggie. “The dictionary of feminist theory”. USA: Ohio State University Press, 1990.
- [4] Narwoko J. Dwi & B. Suyatno. “Sosiologi teks pengantar dan terapan. Jakarta: Kencana, 2010.
- [5] Oakley, Ann. “Sex, gender and society”. London: Temple Smith (revised edition, Gower), (1972/1985).
- [6] Rokhmansyah, Alfian. “Pengantar gender dan feminisme: pemahaman awal kritik sastra feminisme. Yogyakarta: Garudhawaca, 2016.
- [7] Hermawati, Tanti. “Budaya jawa dan kesetaraan gender” in *Jurnal Komunikasi Massa* Vol.1, 2007, pp. 18- 24.
- [8] Arikunto, S. “Prosedur penelitian suatu pendekatan praktek”. Jakarta: Rineka Cipta, 2010.
- [9] Corbett, Greville G (Ed). “The Expression of gender”. Germany: De Gruyter, 2014.
- [10] Fauzan, M Romyan. “Perempuan dalam bingkai budaya visual”. Yogyakarta: Garudhawaca, 2013.
- [11] Murniati, A Nunuk P. “Getar gender”. Magelang: Yayasan IndonesiaTera, 2004.

The Local Wisdom of Malay Society of Coastal Area in the Using of Natural Resource

(The Study Case of the Farmer of Sialang's Honey Bee in Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak of Riau Province)

T. Romi Marnelly

Sociology Department, Universitas Riau
Pekanbaru, Indonesia
E-mail: tengkuromimarnelly@gmail.com

ABSTRACT

The Malay society of coastal area of Riau is known as friendly society with the nature. One of is in kampung Rawa Mekar Jaya, Subdistrict of Sungai Apit, Regency of Siak. This time, there is the local wisdom that is still held out especially in the natural resource processing of sialang's honey bee. This local wisdom is pointed to the fact of the forest degradation of forest conflagration and illegal logging that is done by the irresponsible sides so the population of sialang tree decreases more and more every year. Therefore, it's needed to be observed what kinds of the local wisdoms that are still implemented by the region government to protect sialang tree and increase the wealth of society especially the farmer of sialang's honey bee. The method that is used in this research is in qualitative with the sampling purposive technic. And the result of this research is being able to identify the shapes of local wisdom of the farmer of the sialang's honey bee namely doing the community self-help in harvesting the honey, creating the harmony, managing the conflict resolution, keeping the health, education, doing the environment guidance, doing perpetuation and culture innovation, doing the identity strengthening, striving for the wealth increase and making the law. Meanwhile, the policy that is implemented by the region government involved the protection of forest and sialang tree has not been maximum yet so far. So far there has not been the region regulation yet that is made by the government of Siak Regency in order to protect the forest especially sialang tree and there has not been the program of empowerment yet that is succeed for the wealth increase of farmer especially the farmer of sialang's honey bee.

Keywords: Local Wisdom, Sialang's Honey, empowerment, sungai Apit

I. PREFACE

The Background of Research

The local wisdom is one of culture heritage of society which is passed on from one generation to other generation bequeathed naturally that has goal for keeping so that the tradition keeps on holding out and maintaining well. The wisdom means that everything has each function in the earth and every individual needs to respect and appreciate its role to complete the task of the society. If this local wisdom can be kept well so there will be no chaos that are caused by the human's greed to get more than other societies.

The Malay society is the society that is one with the nature. In using the nature, they really maintain the ecosystem balance. They have various local wisdoms such as the wisdom of maintaining the environment both nature environment and social environment, custom wisdom, form a group wisdom, and wisdom of filling daily needs. The wisdom in this Malay culture is made in behavior of society's life carefully in order not to cause the frictions that cause the dissension and the conflict between Malay society to happen. So for the

Malay society reveres the local wisdom culture is the pride for every individual in the society life. If there is society that forbids the wisdom values is considered also as custom transgressor and can be imposed sanction both such as material and social sanction.

The Malay Society of Riau coastal area local wisdomly lives in coastal area, river side, and forest edge that has goal in order to be easy to get food sources that come from sea, forest, and river. Their residence usually looks out on the beach and the river and their house has the shape of a stage that has goal so that the wild animal is not easy to enter the house. A part of Riau Province is peat moss land so the Malay Society of Riau Province lives and stays in the peat moss, because the peat moss land is susceptible of climate change so the Malay society of Riau Province has many local wisdoms in keeping their environment.

One of the region in Malay society of Riau coastal area that has local wisdom is Kampung Rawa Mekar Jaya Subdistrict Sungai Apit Regency Siak of Riau Province. Kampung Rawa Mekar Jaya is on the coastal area of Sumatra Island that most of its region has peat moss land, generally the society residence is on the river side and coastal area meanwhile its means of livelihood

is various such as farmer, fisherman, worker, and others.

The total of inhabitant of kampung Rawa Mekar Jaya can be seen in this followings table:

Table: 1

The Total of Inhabitants of Kampung Rawa Mekar Jaya in The Soul

| No | Information | Total |
|----|-------------|-------|
| 1. | Woman | 560 |
| 2. | Man | 450 |
| | Total | 1.010 |

Source: The Village Office of Kampung Rawa Mekar Jaya, Year 2016

In 2016 the total of inhabitant of Kampung Rawa Mekar Jaya numbers in 1.010 souls that consist of 560 Women and 450 Men. Meanwhile the total of family numbers in 310 heads of household.

One of local wisdom of Malay society in Kampung Rawa Mekar Jaya is in using thing of Sialang's honey bee. The honey bee of Sialang is local means of livelihood for part of Kampung Rawa Mekar Jaya's society in filling daily needs passed on from one generation to other generation. The removal process of Sialang's honey has still traditional character nevertheless there are some the change of way and removal time. In a long time ago, the removal was done at the night but now the removal is done by part of people in the afternoon. Meanwhile the removal way of Sialang's honey bee in a long time ago used magic formula and special ritual, meanwhile now only increasing security such as using rope and protection shirt from bee sting.

According to the society of kampung Rawa Mekar Jaya that depends on their life from the result of Sialang's honey bee, the total of sialang tree keeps on decreasing and has impact to the total of honey bee that was got. In this followings table, the total development of sialang tree can be seen in Kampung Rawa Mekar Jaya as followings:

Table. 2

The Sialang Tree of Kampung Rawa Mekar Jaya

| No | Year | Total |
|----|------|-------|
| 1. | 2012 | 115 |
| 2. | 2013 | 97 |
| 3. | 2014 | 71 |
| 4. | 2015 | 56 |
| 5. | 2016 | 34 |

Source: The Village Headman of Kampung Rawa Mekar Jaya Year 2017

From the upper of the table, it's clearly that the total of sialang's honey experiences descent, this thing is confessed by various sources because of the increasing clearing of land and lively conflagration. This thing influences to the total of sialang's honey so the total that is harvested by the society also experiences descent and has impact to the raising of bee price. Nevertheless, it's not in proportion with the wealth of society that works as honey bee farmer of sialang that depends on the life from the kindness of honey.

Thus, the research needs to be done about the problem of sialang's honey that is faced by the Malay society of Kampung Rawa Mekar Jaya that is in the coastal area of Riau in defending their local wisdom from various threats and pressures that happen.

The Problem Formulation

According to the upper of background so the main problem that will be learnt namely:

1. What kinds of local wisdom values of Sialang's honey bee that grow and develop up till now in natural resource using of Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak?
2. How is the policy model that is implemented by the local government up till now to protect sialang's forest ecosystem and increase the wealth of sialang's honey farmer of Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak?

The Research Purpose

The purpose of this research is as followings:

1. For describing the local wisdom of Coastal area Malay Society, in this case, The honey farmer in maintaining dan conserving sialang's honey bee in Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak of Riau Province.
2. For learning and analyzing and evaluating the policy model that has been implemented by the Local Government in framework of protecting sialang's forest ecosystem and increasing the wealth of sialang's honey bee farmer.

II. THE LIBRARY OBSERVATION

The Local Wisdom of Environment Degradation Solution

The local wisdom is shaped as local society cultural superiority and geographic condition in the wide meaning. The local society is past time cultural product that should pass on from one generation to other generation must be kept on becoming life grip. Although having local value but the value that is contained inside is considered very universal or connected with the public.

The followings, Sibarani (2012:1) revealed that the local wisdom is remembering the past, understanding the present, and preparing the future. The meaning is remembering the past time means trying to dig out the past time tradition, identifying past time means digging that past time, choosing that past time tradition, and then picking things that had value in that past time tradition. Understanding nowadays means knowing the life problem of nowadays with all excesses and shortages and giving solution in that problem by implementing the past time tradition values.

Meanwhile Haba (2007:11) explained the local wisdom referring to various cultural richnesses that grow and develop in the society that is known, believed and confessed as important elements that can thicken society cohesion. Moreover (Haba 2007:4) explained that there are some functions from local wisdom namely:

1. As the sign of a community;
2. The adhesive element (cohesive aspect) cross people, cross religion, and trust;
3. The local wisdom doesn't force or top done, but a cultural element that is in the society, therefore the binding capacity has more its effect and holds out;
4. the local wisdom gives togetherness color for a community;
5. the local wisdom will change mindset and on both sides relation of individual and group by putting on the common ground or the culture that is owned
6. The local wisdom has function to push the building togetherness, appreciation and as a mechanism together for warding off various possibilities that reduce even destroy, communal solidarity that is believed and grows on together consciousness, from an integrated community.

The followings, Rahyono (in Sinar, 2011:4) revealed if genius local disappears or is annihilated, the nation personality is faded, because of the following things.

1. The local wisdom is inherent identity maker since born.
2. The local wisdom is not a strangeness for the owner.
3. The emotional involvement of society in the full and total comprehension of strong local wisdom.
4. The learning of local wisdom doesn't need forcing.
5. The local wisdom can make dignity and confidence grow.
6. The local wisdom can increase value of nation and state.

Meanwhile Sibarani (2012:5) revealed that there are values that are contained in the local wisdom, as follows:

1. The hard work (such as: work ethic, tenacity, innovation, point of view and mission of work, and work discipline)
2. The community self-help (doing and finishing the work together)
3. The harmony (tolerance attitude intermembers of a religious community, ethnic, culture)
4. The conflict resolution (attitude in solving problem is suitable with custom law)
5. The health (keeping the good life personally and society)
6. The education (the raising of knowledge about a thing)
7. Maintaining the environment (guarding the environment to maintain the life chain)
8. Reservation and culture innovation (maintenance and development of culture heritage)
9. The identity strengthening (maintaining culture originality)
10. Raising the wealth (adding society's income)
11. The law (the norms and custom rules that have been determined and must be obeyed)

According to Sayuti (2005:12) the effort to find the new nation identity on the basis of local wisdom is an important thing for the nation culture unification on the basis of archipelago regions identity. From upper information so it's clear that the local wisdom that is on region culture has lived and developed since a long time ago. Therefore, the maintenance and reservation of region culture needs to be done for building the longing of earlier society life, where that thing is a measure of nowadays life.

For understanding more forward about the local wisdom needs to see some definitions that are formulated by some experts. The local wisdom is all shapes of knowledge, confine, understanding, or perception and habitual custom or ethic that guide human behavior in the life in ecology community (Keraf, 2002). The simple understanding, revealed by Gobyah (2003) that revealed that the local wisdom is a truth that has been in tradition or steady in a region. The opinion is the same as Jim Ife (2002) that the local wisdom is the values that are created, developed, and held out in local society and because its ability to hold out and become life compass of its society. Inside the local wisdom contains various mechanisms and ways to behave, have behavior, and act that are given shape in cultural social arrangement.

So large this local wisdom urgency in the process and mechanism of development that follows sustainable development principles in Indonesian, has been included

in UUD 1945 Article 18 B verse (2) that reveals that : “The state respects the society unifications of custom law and tradition rights as long as they live and appropriate with the society progress. Then Article 28 I verse (3) clarifies that the identity of culture and traditional society’s right are respected in accordance with the development of era and civilization”.

What the local wisdom values that are contained in the society unifications of the custom law. According to Moendardjito (in Ayatrohaedi, 1986) revealed that the local wisdom is potential region culture element as genius local because it has been examined its ability to hold out until now. There are local wisdom’s features as followings:

1. Being able to hold out against the influence of foreign culture
2. Having ability to accomodate the elements of foreign culture.
3. Having ability to integrate the element of foreign culture inside original culture.
4. Having ability to control and
5. Being able to give the direction to culture development.

Meanwhile the values that are contained in the local wisdom according to

Connected with the shapes of local wisdom, can be categorized into 2 kinds namely tangible local wisdom and intangible local wisdom. (Suryana, 2010).

1. The tangible local wisdom consists of:
 - a. *Textual* : namely some kinds of local wisdom such as value system, manner, special determination that are given shape into the form of written note, like found in the traditional holy book of divining manual, calender and prasi (written culture on manuscript of such palm leaves).
 - b. *Architektural* : Many traditional buildings that are reflection from the shape of local wisdom, such as Custom House building.
 - c. Culture Preserve means (Art Work): Many culture preserve means that are one of the shape of local wisdom, for example, kris, plow, etc.

2. The intangible local wisdom

The intangible shape of local wisdom, such as religious advice, various proverbs and sayings, magic formula, etc. that are told verbally and passed on one generation to other generation that can be song or ballad and ritual that consist of traditional teaching values. Through the religious advice or the other intangible shapes of local wisdom, value and social norm are revealed orally/verbally from generation to generation.

In more detail, the dimention that is adhered in the values of this local wisdom is revealed by Jim Iffe (2002) as followings:

1. *Local knowledge*: Local knowledge is involved with the change and climate cyclus of dry season and wet season, kinds of fauna and flora, and condition of geography, demography, and sociography.
2. *Local value*: to arrange together life under society, so every society has rule or local values that are obeyed and agreed together by all members. These values usually arrange the relation between human with human, human with nature and human with its God.
3. *Local skill*: That the ability to survival for the fittest from every society can be fulfilled if the society has local skill, the most simple such as going hunting, gathering, harvesting until making household industry. The local wisdom has subsistent characteristic. This local skill has also characteristic of life skill.
4. *Local resource*: The society will use local resource appropriate with the needs and won’t exploit big as or comercialized. this local resource has been devided its allotment, such as forest, garden, water source, agricultural land, and housings, This owner of local resource is usually collective or communal.
5. *Mechanism of Local Decision Making*. Each society has different mechanism of decision making. There is society that does democratically or sits same low stands same high. There is also society that does in stages or in high step by step and with steps down.

Referring to the various understadings, shapes, values, functions and dimentions in local wisdom, according to the opinion of the experts, so some principles of local wisdom can be concluded that are respected and practised by the communities of custom society, namely among others: *First*, the dependency of human with nature that sets the relation harmony as condition where the human is part of its own self that must be kept its balance; *Second*, the authority right of authority and/or on certain custom region that has exclusive characteristic as the ownership with community (*comunal property resources*) or collective that is known as custom region (region, privately owned land, landlordism) that involves all people to maintain and manage it for the justice and wealth together and guard it from the foreign exploitation. *Third*, the system of knowledge and custom arrangement structure give ability to solve the problems that they face in the using of natural resource. *Fourth*, the system of allocation and custom law enforcement to secure the resource of

together property from the using in luxury, both by the own society and the foreigner of community; *Fifth*, the mechanism of result even distribution from natural resource of together property that can stifle social jealousy in the middle of the society.

Many study results that represent that traditional society in Indonesian in custom is succeed to maintain and enrich natural biodiversity for its life perpetuity. A reality that a big part of custom society still has local wisdom in managing natural resource. These local systems are different one another appropriate with the culture social condition and local ecosystem type. They generally have the system of knowledge and management of local resource that is bequeathed and grown continuously passed on from one generation to other generation. In the same manner as revealed by Bambang Rustanto, et al. (2006) about the existency of local wisdom of custom society as followings:

“This traditional wisdom, example, can be seen in custom society community that lives in the ecosystem of south swamp of Kimaan Island in Merauke Regency, Irian Jaya. This custom community is succeed to develop 144 cultivators of edible tuber, or higher than found in the tribe of Dani in Plaimo, Baliem Valley, that only 74 varieties of edible tuber. In various custom communities in Maluku Archipelago and a big part in north Irian Jaya are found the systems of allocation management (the method of making use) and the special local integrated management of land and sea ecosystem, complete with the custom infrastructure (institutional) that guarantees these local systems to work effectively. Up till now, only a small part that is known by modern knowledge world about these local systems. For example among others are custom institution of “sasi” that is found in a big part of Maluku that arranges the using sustainable on a region and kinds of certain biological. The another example that has been known is the cultivation has rotation of custom communities of “Dayak People” in Kalimantan is succeed to solve the problem of unfertile land.”

In understanding the local wisdom, especially the environment wisdom so the poverty, stupidity and backwardness can not only be relieved but also can be prevented because the eternal resource for the next generation (Soerjani, 2005).

2. The Previous Research

This research about the local wisdom of Coastal area Malay Society in the Using of Natural Resource (the Study on Sialang’s Honey Bee Farmer in Kampung

Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak of Riau Province). Appropriate with the research title that has been mentioned and based on the research exploration, so some writings are found that are involved with the study namely as followings: The research that was done by Suparmini, Sriadi Setyawati and Dyah Respati Suryo Sumunar in 2013, with the research title “the Perpetuation of Environment of Badui Society Having as a base Local Wisdom in The Kanekes Village Sub. Leuwidamar Rg. Lebak of Banten Province. This research has goal to know and observe about the effort of environment perpetuation of Baduy society that lives and belongs to. The research result shows that the life of Baduy tribe still depends on the nature and always keeps the nature balance. the local wisdom of Baduy society in managing natural resource among others it’s seen from the rule of land distribution to become three zones namely zone of reuma (dry field and land work) and zone of Leuweung kolot (old forest). The relation under the life aspects of Baduy society in Kenekes has synergy integration in making sustainable life. The perspective of Baduy society is relative same towards the relation under the culture social life, economy and environment processing. The customs and traditions as part of local wisdom are still held sturdily by Baduy society in facing modernization, included in preserving the environment. The behavior shape of environment perpetuation and conservation that is implemented by Baduy society among others: (1) agricultural system (2) knowledge system (3) technology system and (4) conservation practice.

- 1) The research that was done by Zulkarnain, Asdi Agustar, Rudi Febriamansyah in 2014 that had title “The Local Wisdom in Using and Perpetuation of Coastal Area Resource (The Case Study in Panglima Raja Village Subdistrict Concong Regency Indragiri Hilir of Riau Province). This research has goal to know local wisdom that has been implemented and still occurs in the using and perpetuation of coastal area resource. And How the role of local institution involving local wisdom in the using and perpetuation of coastal area resource is ? The result from this research as followings (1) The local wisdom of villager of Panglima Raja about the using of coastal area resource that still belongs such as: (i) deciding the time to catch fish based on the weather and the season; (ii) developing the fish catching tool and cockle shells collecting tool, and; (iii) deciding the mangrove tree logging area. Meanwhile the local wisdom about coastal area resource perpetuation such as: (i) ritualization (ceremony) of respecting towards the sea; (ii) there is commitment not to catch and

kill the dolphin, throw the garbage into the sea, use machine tool in catching fish and collecting cockle shells ,and; (iii) keeping the mangrove forest around coastal area. The main source of local wisdom is the belief or custom and Moslem and Hindy's teaching. The local wisdom is based on the understanding of ecological principle and ecosystem that is put in simple language, such as the philosophy that contains value substatial and has behavior towards nature/environment (2) The role of custom institution towards the local wisdom experiences decrease since the kingdom era. The national government continues the system and the ways that have been valid. The village government institution in this case has not yet had maximum role in accomodiating the values of local wisdom in participative.

- 2) The research that was done by Henni Elyati, Zulfan Saam, Yusni Ikhwan Siregar in 2015. The research of "The Local Wisdom of Sakai Society in Preserving The Forest adn The River in Mandau Subdistrict." The research purpose is knowing how the local wisdom of Sakai Tribe can hold out the forest perpetuation and can hold out river perpetuation. The research result shows that from the past time, the Sakai tribe was not used with the era development that belongs to Indonesia now because The Sakai Tribe really confirms their ancestor principle namely if they want to eat so they must look for by themselves by going hunter and daily life of this Sakai Tribe also harvesting and cultivating. In preserving the forest and the river, Sakai society determines the sanction that is given to Sakai's nephew or niece that do illegal logging. Where in opening the land, there is a term, the blood changes blood, soul changes soul. It means if cutting the tree, there is tree stump, so it must be changed by another tree so the tree keeps on. The lands that don't have the forest, planted again because all Sakai's nephews or nieces have been asked to do cultivation of seedings. there is cut tree, so besides the tree is palnted again, the function is to protect the plants that are around such as long bean, etc.

III. The Conceptual Definition

This research needs to be made the concept limitation so that the multiexplanation doesn't happen against the used concepts among others:

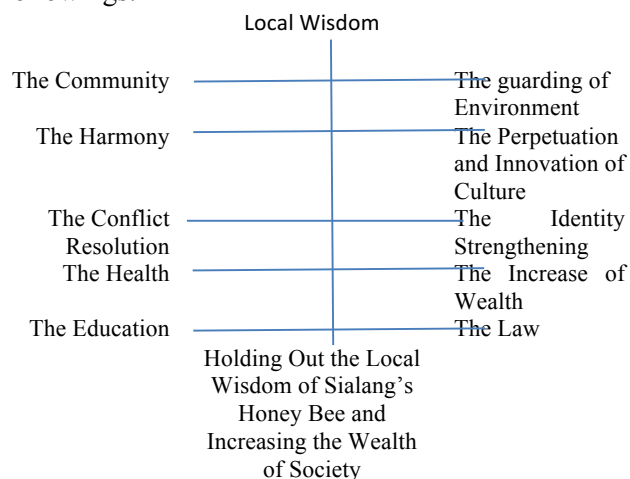
1. The local wisdom that is meant in this research is all shapes of knowledge, belief, understanding, or insight and habitual custom or ethics that guide human's behavior in the

using and processing of natural resources eternally.

2. The Sialang's Honey Bee is the bee that lives and nests in the sialang tree.
3. Sialang is the kind of big tree and trunk that can be high until 45 meter, the middle line of its trunk can reach 100 cm or more, and the height can reach 25 until 30 meter.

The Thought Framework

The thought Framework of this research as followings:



Picture 1. Frame of thought

IV. The Research Method

The research method that is used is in descriptive qualitative through data reduction, data presentation and conclusion making with the phenomenology approach where the observer will do deep interview that then the result will be processed and interpreted to be analyzed further by using the sociology perspective. The research location is determined in Kampung Rawa Mekar Jaya Subdistrict of Sungai Apit Regency of Siak of Riau Province because this location has Sialang tree and the activity that is connected with this sialang's honey is done by the society and has local wisdom that is bequeathed passed on from generation to other generation. The research subject has total of 7 people namely consisting of 3 owners of sialang trunk, 1 climber of sialang trunk, 1 yardmaster of sialang trunk, 1 village chief and 1 custom head.

The Data Collecting Technic such as observation namely the observer does some observations against nature condition and culture of society and the activity of honey harvest. The following doing the interview with the key informant that knows the details of sialang's honey bee and the practice of local wisdom of society. This technic is called purposive sampling. The information and the beginning data then are confirmed

with other informants so the validity of data and information can be justified the truth.

V. THE RESULT AND THE DISCUSSION

The Local Wisdom of Farmer of Sialang's Honey Bee In Kampung Rawa Mekar Jaya

1. The Community Self-help

The Community self-help is special character of society that lives in the village puts forward the cooperation to fulfill daily needs. On the society of Kampung Rawa Mekar Jaya that works as Sialang's Honey farmer, the community self-help is the shape of helping each other in doing Sialang's Honey Bee Harvest, the society with the right owner of sialang's trunk with the people that want to harvest, usually consist of: 1) The owner of Sialang's Trunk 2) The Climber of Sialang's tree 3) The rope Keeper 4) the honey collector 5) the honey distributor 6) small boat driver.

The society that wants to join together in the Harvest of Sialang's honey Bee is never limited its total and still distributed the result appropriate with each job portion. This thing is because the society considers that Sialang's Honey is the livelihood together that is pointed to the society. For the society of Kampung Rawa Mekar Jaya that doesn't follow the harvest but they want to consume by themselves or for the medical needs will be given sufficient freely. This thing is for keeping the harmony under the villagers.

Finishing the Harvest of Sialang's Honey Bee together is the local wisdom that is still kept up till now so that all society can enjoy the harvest result of sialang's honey bee. With the harvest in community self-help reflects the compactness of the villagers. The developed myth is involved the harvest activity together is the society believes that the harvest is not done together will be bad impact such as The Honey Bee in the Sialang Tree will be disappear.

2. The Harmony

Involving the harvest activity of this sialang's honey so that the conflict won't happen so the society creates the harmony under the society both from religion, ethnic and culture by putting forward the tolerance. as followings:

- 1) Before harvesting or climbing the Sialang tree first of all must pray or ask the security so something won't happen.
- 2) The society that follows is not limited from all religions as long as following the valid rule.

- 3) In maintaining Sialang tree, the owner is obligated to keep the environment and pray so that the sialang tree is still alighted by the bee.
- 4) Giving the chance to everybody to follow without looking at the history of tribe or ethnic, reflected from the harvest that not only the Malay society can harvest the sialang's honey bee but also the society whose ethnic of Java and Batak can join. The society that follows in the harvest of sialang's honey bee may use their own culture but they must local culture or local Malay's culture.

3. The Conflict Resolution

The conflict is normal to happen in various regions in Indonesian especially involving the problem of natural resource. The Malay society of coastal area in Kampung Rawa Mekar Jaya puts forwards the attitude of respecting each other to keep so that the conflict won't happen interfellow.

If the conflict happens, the problem solving ususally uses two laws namely custom law and state law. The state law must be given to the law upholder that is in the region of Kampung Rawa Mekar Jaya but if it's solved in custom, it can be done as followings:

- 1) For those who kills or cuts the sialang tree will be imposed the substitute or the sanction such as:
 - a. The white cloth or shroud of unbleached cloth that covers all parts of Sialang tree
 - b. The rice 44 Kg, Sugar 33 Kg, Cooking oil 22 , Salt 11 kg, and Tamarind 1 Kg must be given to the society that is categorized poor people in Kmapung Rawa Mekar Jaya
 - c. Planting the same tree that is cut as many as 44 trees around the cut trees
 - d. Spreading around the seed or germ of fish as many as seven kinds of fish very much so hunderd in Peat moss river.
- 2) For the thief of sialang's honey bee will be imposed the sanction or the fine as much as 44 mayam of gold that is given to the owner of sialang tree
- 3) For the forger of Sialang's Honey will be imposed the sanction must go out from the village of Rawa Mekar Jaya. The Dropping of sanction is based on the discussion interfigure of society with the owner of sialang tree that has goal to keep the tree perpetuation so that it won't be extinct.

4. The Health

The health is the most important thing that must be kept by every individual especially by keeping the tidyness, this thing has been taught passed on from one generation to other generation. For the Malay society of coastal area of Riau that works as the farmer of Sialang's Honey Bee in Kampung Rawa Mekar Jaya.

The local wisdom of the removal profession of Sialang's honey bee can be seen as followings:

- 1) Forbidden to taste or drink the honey in the time of harvest, If it's broken so it will be many sialang's bees that will sting the people and must be fatal impact.
- 2) The equipment of honey removal should be clean from all dungs, if it's still used so the Sialang's honey that is taken will taste sour and it's not proper to be sold.
- 3) Hard forbidden to mix Sialang's honey with other compounds when the honey removal is happening, if this thing happens, it will be impact to the sialang's honey that it won't be exist later or the sialang tree will be left by the bee.

5. The Education

The local wisdom is bequeathed passed on from one generation to other generation through the non formal education. The value of local wisdom that is taught in the harvest activity of Sialang's Honey Bee in the coastal area Malay society of Kampung Rawa Mekar Jaya can be seen as followings:

- 1) Teaching to the next generation so they usually keep the Sialang tree by preserving.
- 2) Teaching the pray or magic formula in the harvest of Sialang's Honey Bee to everybody that wants to learn so that they can give the knowledge from the education to process the honey bee well and correctly.
- 3) Teaching the next generation to preserve Sialang tree by keeping the forest environment of peat moss swamp in Riau coastal area.

The developing myth in this Malay society of coastal area is if the local wisdom is not taught to the grandchildren or the next organizer of Sialng's honey will be fatal such as disappearing honey in sialang trunk and many disturbances that will try to disturb the residence both spiritual creatures and the shapes that resemble animal or the same species.

6. The guarding of Environment

The local wisdom of society of Kmapung Rawa Mekar Jaya in keeping the environment especially in keeping the sialang tree so the bee still nests in the tree. as followings:

- 1) It's hard forbidden around sialang tree to do unaproprate things with the valid norms such as drinking, gambling, and immoral behavior. If this thing happens so the misfortune will happens that will befall to the people that break the norm such as possessed by a devil, disappear, difable without causal, and it can be died.
- 2) Keeping the tree around the tree of Sialang's Honey Bee so it keeps being fertile and it's forbidden to be cut or destroyed its habitat. If this

thing happens so it will be fatal, one of is disappearing honey in sialng trunk or it will be bad creature that enters the residence and disturbs the people around sialang tree.

- 3) The existency of tree depends on the environment ecosystem around the sialang's honey tree. Therefor, the society tries so the tree won't be disturbed by the irresponsible people. If the environment damage happens, the society will prosecute in custom law and state law. All these things are pointed to the existency of sialang's honey tree.

7. The Perpetuation and Innovation of Culture

The Perpetuation that is done by the society in maintaining the culture of sialang's honey processing is not free from culture innovation among others:

- 1) In the process of sialang tree climbing in habitual only rests on the stuck nails, but the society makes new innovation by adding the security rope for the climber of sialang tree in order to add security for the workers.
- 2) The obtained Sialang's honey is not more wrapped, only the honey is taken but the society makes new innovation such as selling honey in the nest or it's known as sambang, this thing has goal to keep the belief and security of honey quality until to the hand of consumer.
- 3) Although the society who innovate the process by following the era development but it's still on normal meadow in customs and traditions. But if there is forbidden prohibition, it will be bad impact to the result of sialang's honey.

8. The Identity Strengthening

In keeping the existency and maintaining Sialang trunk tree from the unwanted threats such as sialang tree cutting, killing and chasing away the bee from sialang tree, or the environment ecosystem damage of sialang' honey bee, so identity strengthening is very important thing. therefor, the maintainance of Sialang Trunk strengthens their trunk with various kinds among others as followings:

- 1) Everybody or society finds the bee that nest on a tree and it's believed as Sialang Trunk and there is no owner and sign in that tree trunk, so the people, if they want to have it, they must write or crave the name in the trunk. Thus, the sialang trunk has already belonged to him and deserved to the honey in the brachn, and it's not disturbed by the next founder.
- 2) The identity strengthening for the organizer of Sialang's Honey Bee must socialize to the villagers by the way for the society that wants Sialang's honey for the own consumption needs or medical

needs, the owner of sialang trunk is obligated to give in vain or free to the society that needs it.

- 3) The Processing or Belonging of Sialang trunk must be dealt together in the shape of unwritten custom law. The processing strengthening is also protected by the state law and if those who try to break the rule, they must face with the law upholder.

9. The Increase of Wealth

The Local Wisdom of Malay Society of Riau's coastal area in common has goal to increase the society's wealth. the shape of local wisdom involved the wealth as followings:

- 1) Every society of Kampung rawa mekar Jaya deserves to follow the harvest of Sialang's Honey Bee without looking at the tribe, culture, and religion. All those things are for the sustainability or icrease of the society's wealth around Sialang Trunk.
- 2) The result distribution of Sialang's honey is devided to three parts in the shape of honey and money after the operational budget is cut, the distribution is devided from:
 - a) One part for the owner of Sialang
 - b) One part for the climber of Sialang Trunk
 - c) One part for the distributor group
- 3) For increasing the wealth of society's kampung Rawa Mekar Jaya through the processing of Sialang's Honey Bee, the processor side often bargains the work merged into the harvest of Sialang's Honey Bee.

10. The Law

The traditional wisdom is the shape of valid law in the middle of society unwrittenly. the laws of local wisdom can be shaped namely

- 1) the norms namely
 - a) The religion norm keeps honey bee not to leave sialang tree, the owner usually in 1 Muharam prays under the sialang tree. This thing is form of thank God towards the honey that has been given to them.
 - b) The culture norm can be shape in traditional wisdom in distributing into the society that needs sialang's honey not for the the goal of selling or business. This thing is for keeping so that intersociety can feel the result from the processing of Sialang's Honey Bee Tree in Kampung Rawa Mekar Jaya.
- 2) The custom rules that have been determined and must be obeyed both by the processor or owner of sialang trunk and society in Kampung Rawa Mekar Jaya. If the custom rule is forbidden so the belief of coastal area Malay society will get damage or something unwanted.

The Policy of Local Government Involved Sialang's Honey Bee

The society in Kampung Rawa Mekar Jaya feels that the role from The Forestry Dienst both in Province and in Subdistrict has not done maximum thing yet to protect the Tree Of Sialang's Honey Bee. This thing is proven that there has not been yet local rule that protects the Tree of Sialang's Honey bee, so there is no data that is held by the Forestry Dienst about Sialang Tree. According to the information of the society up till now, there is no information about taking care of or preserving the sialang tree from the local government.

The low law enforcement against the subject of slash and burn causes every year there is burnt forest and causes the smoke pollution that will distrub all aspects of life, especially the population of sialang's honey bee. The lack of Tree of Sialang's Honey Bee, this thing is not released from the phenomenon that happens in Sumatera in general and Riau Province in special namely The conflaguration of Peat moss Forest that causes the smoke and covers a big part of Riau Province. The impact of the smoke that is caused by the conflaguration, many sialang's honey bee that disappear from the tree that is alighted. As much or as thick smoke causes sialang's honey bee to be died. Many societies find the honey bee died in the river edge, beach and lake. Not least from these sialang trees are died because the conflaguration of peat moss forest occurs. The decreasing total of Sialang Tree that is alighted by Honey Bee influences to the income of society as farmer of sialang's honey bee and has also impact to the availability of job vacancy in Kampung Rawa Mekar Jaya especially, this thing causes the worriness for the government both province government and region government. In 2015 through the forestry dienst of Riau Province gave guidance and help such as the cultivation of honey bee, this thing has goal to decrease the pressure or independency of society towards Sialang's Honey Bee.

Nevertheless, this thing doesn't run appropriate with the wish and hope of all sides, this thing is caused by unbreeding honey bee appropriate with the theory that has been learnt. The society that obtains the help of cultivation of honey bee has reason that the weather condition really doesn't support against the development of raised honey bee.

Kampung Rawa Mekar Jaya has some companies that are considered don't contribute to the village and even intimidate and cause the damage of environment against the river and peat moss area, especially disappearing or dying trees of Sialang's Honey Bee.

VI. The Closing The Conclusion

The conclusion from this research as followings:

1. The shapes of local wisdom of Malay society of coastal area namely the farmer of sialang's honey bee of Kampung Mekar Jaya Subdistrict of Sungai Apit Regency of Siak are first, doing the Community self-help in the harvest activity. Second, creating the harmony interethnic. Third, the conflict resolution is involved the use of forest resource by using custom law and state law. Fourth, keeping health by forbidding hard the interference of honey with other compound and keeping cleanliness of honey removal equipment. Fifth, involved education aspect, where the local wisdom is taught passed on from one generation to other generation through non formal education. Sixth, the environment guidance namely around sialang tree is forbidden hard to do the things that is appropriate with valid norms to the culture of Malay society of coastal area such as drinking, gambling, doing immoral attitude, forbidden to be cut or destroyed its habitat. Seventh, The Perpetuation and culture innovation where the process of climbing sialang tree, the society makes new innovation by adding security rope for the climber of sialang tree in order to add the security that is working, then sells the honey that is still in the nest or more known with the name of sambang. Eight, the identity strengthening namely they give sign to sialang tree so they can have it. Ninth, the wealth increase namely distributing the harvest result appropriate with the agreement and tenth, creating the law such as religion norm and culture and creating the myth.
2. The policy that is done by local government involved the protection of forest or sialang tree as far as has not been yet maximum. As far as the local government has not yet made the region rule in order to protect the forest especially sialang tree. This thing is proven with luster forest conflaguration and illegal logging shows the weak law enforcement against the people or company that do the forest damage. Meanwhile for the society empowerment in developing honey bee can also be told succeed yet.

The Suggestion

- 1) For the society, this local wisdom needs to be held out and preserved in order to maintain the balance with the environment. This thing is proven that the local wisdom can keep the environment perpetuation in the shape of a guidance or habitual that is sanctified and in the shape of sign that must be obeyed by the society that is passed on from one generation to other generation.

- 2) For the law upholder apparatus, the law enforcement is needed for the subject of illegal logging and forest conflaguration so that the actions of forest destroy don't happen again.
- 3) For the government of Siak Regency, the programs of society empowerment involved the development of sialang's honey bee is needed to be made so that the wealth of sialang's honey farmer increases. Besides that, in order to protect the forest of sialang, the region government also needs to make the region regulation involved sialang's honey bee.

VII. REFERENCES

BOOK LIST

Book

- [1] Asruddin Anshoriy dan Sudarsono, 2008. Kearifan Lingkungan, Dalam Perspektif Budaya Jawa. Yayasan Obor Indonesia
- [2] Gobyah, I. Ketut, 2003. *Berpijak Pada Kearifan lokal*, www.balipos.co.id.
- [3] Haba, 2005. Pangan, Kearifan Lokal dan Keanekaragaman Hayati. Yogyakarta: Penerbit Cindelarast Pustaka Rakyat Cerdas
- [4] Ife Jim, 2001, *Human Rights and Social Work, Towards Rights Based Practice*, Cambridge: University.
- [5] _____ 2002, *Community Development, Creating Community Alternative Vision Analysis and Practice*, Australia : Longmann.
- [6] Jatna Supriatna, 2008. Melestarikan Alam Indonesia. Jakarta: Yayasan Obor Indonesia
- [7] Keraf, A. S., 2002. *Etika Lingkungan*. Kompas. Jakarta
- [8] Mubyarto, dkk. 1992. *Riau Menatap Masa Depan*, Penerbit, Aditya Media, Yogyakarta.
- [9] Nababan, 1995. Kearifan Tradisional dan Pelestarian Lingkungan Di Indonesia. Jurnal Analisis CSIS : Kebudayaan, Kearifan Tradisional dan Pelestarian Lingkungan. Tahun XXIV No. 6 Tahun 1995
- [10] Rahyono, Juni Thamrin dan Endang Suhendar, 1998. Industrialisasi Kehutanan dan Dampaknya Terhadap Masyarakat Adat. Bandung
- [11] Sayuti dan Eddy Kristiyanto, 2008. Menyapa Bumi Menyembah Hyang Ilahi: Tinjauan Teologis atas Lingkungan Hidup. Yogyakarta: Kanisius
- [12] Soerjani, M. 2005. *Krisis Kearifan Kita*. Surat Kabar Harian, *Kompas*, Kamis 20 Oktober 2005. Jakarta.
- [13] Undang-undang Nomor 32 Tahun 2009 tentang *Perlindungan dan Pengelolaan Lingkungan Hidup* (Lembaran Negara Republik Indonesia Tahun

2009 Nomor 140, Tambahan Lembaran Negara Nomor 5059).

Journal

- [14] Henni Elyati, dkk. 2015. *Kearifan Lokal Masyarakat Dalam Melestarikan Hutan Dan Sungai Di Kecamatan Mandau*. Jurnal Ilmu Lingkungan. Volume 9 (2)
- [15] Suparmini, Sriadi Setyawati dan Dyah Respati Suryo Sumunar. 2013. *Pelestarian Lingkungan Masyarakat Badui Berbasis Kearifan local. Di desa kanekes kec. Leuwidamar kab. Lebak provinsi bante*. Jurnal Penelitian Humaniora. Volume 18
- [16] Zulkarnain, Asdi Agustar, Rudi Febriamansyah. *Kearifan Lokal Dalam Pemanfaatan Dan Pelestarian Sumberdaya Pesisir (Studi asus di Desa Panglima Raja Kecamatan Concong Kabupaten Indragiri Hilir Propinsi Riau)*. E-Journal. Iep. Pasca.ac.id diakses tanggal 8 februari 2017
- [17] Sibarani. *Kajian Kearifan Lokal Masyarakat Dalam Pengelolaan Sumberdaya Alam Dan Lingkungan*. Jurnal Jurusan Pendidikan Biologi FMIPA Universitas Negeri Yogyakarta

The Rising of *Ojek Difa*, Positioning Difabel as Subject in Providing Inclusive Public Transportation Service for Yogyakarta Indonesia

¹Theresia Octastefani, ²Bayu Mitra Adhyatma Kusuma

¹Center for Southeast Asian Social Studies and Department of Politics and Government,
Universitas Gadjah Mada, Yogyakarta, Indonesia

²Department of Islamic Management, Faculty of Da'wah and Communication
Sunan Kalijaga State Islamic University, Yogyakarta, Indonesia

E-mail: ¹theresiaoctastefani@ugm.ac.id, ²bayu.kusuma@uin-suka.ac.id

ABSTRACT

Transportation sector plays a vital role in supporting society mobility. Therefore, the public transportation services must be accessible to all community levels without exception, including the people with disability or difabel. But the facts show that in Yogyakarta for the difabel it is still relatively difficult to access public transportation services. It is caused by several factors such as: the infrastructure is not accessible, the number of fleets are insufficient, and the affordability route problem. These conditions then ignited the difabel to create a difabel-friendly transportation mode, which now is popularly known as *Ojek* (motorcycle taxi) *Difa*. The name of *Difa* was adapted from the word of Difabel or differently abled. This transportation mode is provided, managed, and piloted by the difabel, even though the other society may also use this service. This research uses the qualitative type, descriptive approach, and interactive modeling of data analysis by Miles and Huberman. The data collection is done by in-depth interview, observation, documentation, and literature study. The researcher used this method because the principle objectives of this study aimed to describe and illustrate in a systematic, factual, and accurate statement of the fact and the relationship between phenomena. The research results showed that *Ojek Difa* can open a job opportunity to difabel where they had difficult experience in getting work both formal and informal. Moreover, *Ojek Difa* also is able to improve the socio-economics welfare and establish confidence for their members. It is proved that difabel not only deserves to be object of public transportation services that are provided by the government or the private sector, but also capable of being the subjects who act as a service provider. The rising popularity of *Ojek Difa* is appropriate with the Javanese local wisdom – *migunani tumraping liyan* – which means is useful to others. They are not only give beneficial for difabel's mobility, but also gives benefit to the whole Yogyakarta society in providing inclusive public transportation services.

Keywords: *ojek difa, difabel, inclusive, public transportation service, local wisdom*

I. INTRODUCTION

Yogyakarta is known as a tourism and education city in Indonesia whose name is recognized worldwide. Various exotic tourism destinations and prominent universities can be easily found in this city. This special region is very thick with Javanese culture and philosophy, which are deemed valuable. To strengthen this status, the Local Government of Yogyakarta Special Region seeks to provide adequate infrastructure, for example in the transportation sector. The public transportation sector has become an important concern because it is very influential on the mobility of citizens. One of the newest modes that plays a vital role is the Trans Jogja bus. Trans Jogja was introduced to the public with the spirit of providing inclusive transportation for the whole society, including people with disabilities or difabel.

Meanwhile, the increasing rate of population growth in Yogyakarta Special Region will certainly have an impact on the high demand for mass transportation. Currently the number of difabel in the main city of

Yogyakarta alone is 4,527 of a total population of 457,668. When summed with other areas such as Bantul Regency and Sleman Regency it would be even greater, especially when coupled with Gunung Kidul Regency and Kulon Progo regency where many difabel have not been recorded by the local Department of Social Affairs. Nationally, Yogyakarta Special Region accounted for the numbers of disabled in significant quantities, about 3.89%, or 25,090 people, consisting of 13,589 men and 11,461 women [1]. Such proliferation occurred significantly, especially after the earthquake in Yogyakarta in May 2006. The area is prone to natural disasters. Almost all kinds of natural disasters may occur in Yogyakarta, such as volcanic earthquakes, tectonic earthquakes, tsunamis, hurricanes, floods and landslides. All these disasters could potentially increase the number of difabel [2]. So that the existence of difabel certainly cannot be denied and must be taken into consideration in any development process, especially to realize Yogyakarta as an inclusive city. In order to achieve that ideal, one of real indicators that must be provided is accessible public transportation services for everyone.

But in reality, the provision of public transportation services access, which is accessible for difabel is still very restricted both in the term of number and scope.

Many public facilities in Yogyakarta are still not giving broad access for difabel [3]. However, in reality this type of bus also has limitations in various aspects. First, there is the shelter design and position. The problems include very wide space between shelter door with a bus that stop, a very steep ramp and often directly adjacent to a flagpole, trees, or other objects, with very narrow entrance and ticket gates, until the furniture arrangement which are not friendly for difabel [4]. Second, there is the range of routes. This type of bus is only able to reach in the main roads through the route has been determined. So, difabel have difficulty to get to the shelter independently from their home. In general, it can be said that public transportation service in Yogyakarta is still not really accessible for difabel.

In these conditions, Difa City Tour and Transport or more popular called *Ojek* (motorcycle taxi) Difa presents innovative public transport services that are specifically reserved, piloted, and intended for difabel, despite the fact that the public can also use this service. *Ojek* Difa becomes more special than the others because their motor vehicles used has been modified into a tricycle and have an extra seat for passengers that are able to load the wheelchair without being folded. In fact, this is the first time that has happened in the world, so that's why researchers are determined to examine more deeply about the rising of *Ojek* Difa, what are the impacts toward difabel life in Yogyakarta Indonesia, and whether the rising popularity of *Ojek* Difa is appropriate with the local wisdom.

II. THEORETICAL REVIEW

A. Difabel vs. Disability

Applying the term of disability or difabel is still debated which term has better meaning than the other. So far until now, both are still used in Indonesia. In legality, the Law of the Republic of Indonesia No. 8 of 2016 had used the term of disability. But in the academic perspective, actually the term of disability is not appropriate. It is because both disability and difabel have different meanings. The term of disability refers in two words, namely dis and abilities, which means the inability to do something like normal human beings [5]. While, the term of difabel refers to two different words, namely differently and abled, which means the person that is differently able to do something like others human being [6].

The term of difabel was first proposed by Mansyur Fakihi and Setya Adi Purwanta, who is a blind person from Yogyakarta. Difabel is a new term which was used

to replace the term of disability [7]. The term of difabel is proper to use because it has several factors. First, to change the term of disability which has connotation that is less humanizing. Second, it serves to shift the standardization of physical normalistic as reality and standard measured size of human life. Third, it acts as an effort to not put a person as inferior to another person. Based on these considerations, in this study, the author is agreed to use the term of difabel rather than disability. The term of difabel will be discussed in realizing an inclusive life in Yogyakarta and placing the difabel as a subject of development.

B. Inclusive Concept

Basically, the term of inclusive is not something new for Indonesian people, especially in Yogyakarta. The concept of inclusive emerged from an anxiousness about the social exclusion for difabel. The inclusiveness is an integral part of human rights issues. It is because human rights are rights that are inherent in every human being without exception. Inclusive is understood as a condition that ensures full participation of every human being with various differences, through a range of accommodations that should be done as needed [8]. Or in other words, the approach used should be revised and harmonized with the discourse of rights that are considered able to answer the needs and sense of justice for all including the disabled [9].

The key aspects in inclusive concept include: openness, equality, and respect for differences as diversity. Openness, which means everyone feels safe and comfortable, getting the rights and could carry out its obligations. Everyone has the right to equal opportunity, has the dignity as a person, including regarding independence and free from dependence which can cause it not be able to grow. To support it, difabel need adequate infrastucture to move independently. One of the tools that play a vital role is transportation. As a result, the existence of an inclusive public transport services are very important and strategic.

C. Public Transportation Service

Public service is any activity which is undertaken by the government for a number of human beings who will profit from such activities in a gathering or unity and offer satisfaction even though the results are not related to a physical product [10]. The ideal concept is public services provided by the government to the public should be accessible to everyone without exception. But in fact the government bureaucracy often is not paying attention to the needs of marginalized groups, including difabel [11]. The government bureaucracy tends to favor the interest-oriented groups that occupy the mainstream. So inclusiveness becomes a value that is often overlooked in the public service. Public sector bureaucracy, on the other

hand is often considered too big, too conservative, too politicized, and too wasteful [12].

In this study, the public service will be specified in the transportation sector. In Yogyakarta, although the government still continues to pursue the improvement of mass transportation, but in fact many problems still make it prohibitive. For an example is the Trans Jogja mode which until now is still being featured. Since the beginning, Trans Jogja is designed to be used by all the citizens, including facilitating the difabel [13]. But in its implementation, various barriers are still strongly felt by the difabel. So it can be said that the existence of public transportation in Yogyakarta is not presently really able to answer the needs of the difabel.

III. RESEARCH METHOD

This research is based on a qualitative type and descriptive approach. With the qualitative approach, this type of study is expected to be able to describe fully the subject of research, so as to describe the desired focus of the study, namely address issues that have been formulated and meet the objectives of the study. Qualitative method is the chosen type for this research, as a set of non-statistical inquiry techniques and processes used to gather data about social phenomena [14]. Qualitative research concentrates on the study of social life in its natural setting. Its richness and complexity mean that there are different ways of analyzing social life, and therefore there are multiple perspectives and practices in the analysis of qualitative data [15]. Qualitative research also involves the studied use and collection of a variety of empirical materials that describe problematic moments such as: case study, personal experience, interview, observational, historical, visual text documentation, or interaction. In this study, the researcher uses the data analysis model of Miles and Huberman, which is called the interactive model. Data analysis techniques of Miles and Huberman consist of four activities, namely: data collection, data reduction, data display, and drawing conclusions [16].

IV. ANALYSIS

A. Public Transportation Problem in Yogyakarta

Mass transportation is one form of public services provided by the government to provide transportation services to the people who are living in Yogyakarta. The need for access to affordable transportation to reach out and become something that can not be separated from public life. Transportation has a significant role in the social, economic, political, and other activities. In order to achieve quality public services, the Government of Yogyakarta Special Region (DIY) continues to strengthen infrastructure development quality and

accessibility to all citizens of Yogyakarta, including difabel, with inclusive public transportation.

For difabel, public transportation has a very significant role in their life because they have some limitation in the physical and mental health. Most of difabel persons are suggested to not drive their own transportation mode (bicycle, motorcycle, and car). They can use public transport to help their activity. From the aspect of transportation modes there are few mass transit strategically located in Yogyakarta, such as the Trans Jogja bus. Since public transport is fairly inexpensive and able to reach different locations the presence of Trans Jogja Yogyakarta is welcomed by the whole community, not least by difabel persons. Trans Jogja can contribute in providing appropriate public transportation services for the difabel. For example, by providing a chair that can be folded as needed throughout the fleet and the construction of shelters with the concept that can be accessed independently by difabel.

In reality, the provision of such facilities do not necessarily make it easier for difabel. In fact, the provision of such facilities are lacking attention to accessibility for difabel as a user service. For an example many difabel still have difficult experiences in accessing the Trans Jogja. For wheelchair users, various problems arise when they try to access the Trans Jogja. The problems arise, namely: the space is too wide between the bus stop (shelter) and bus; a ramp is too steep and often directly adjacent to the flagpole, trees, or other objects without any space sufficient; entrance and ticket gates were too narrow; and the arrangement of furniture in the buses is still lacking of hospitable access for difabel. Furthermore, the space is too wide between the bus stop and can threaten the safety of a blind person and semi-ambulant patients (trouble walking but do not need a wheelchair) when going up or down from the Trans Jogja bus. Steepness of the ramp that barely reached 45 degrees also makes it difficult for wheelchair users to access independently or even assisted families who pushed the wheelchair. Thus, the existence of Trans Jogja for difabel is still with limited repaired records.

Figure 1. Ramp in Trans Jogja Shelter is Obstructed by Trees



Source: Researchers Documentation, 2016.

Based on the standard facilities for difabel in Article 5 of the Standard Rules on the Equalization of Opportunities for Persons with Disabilities in 1993 published by United Nations General Assembly, stated that the ideal ramp should have a size of 1 to 12 to 1 to 15 between the high and the base. Moreover, the position of the ramp which often borders on objects in the vicinity such as flagpoles, trees, flower pots and others is increasingly difficult for wheelchair users. The size of the door on the Trans-stop Yogyakarta were average sized 82.5 to 100 cm also makes it difficult for the difabel. Coupled with the ticket gate that is also quite narrow if reserved for the difabel which is about 46-60 cm. Of course this is very difficult for users' tools such as crutches to walk (walking aid) or rollerblading. Such conditions seem trivial to society in general. But for those difabel, especially wheelchair users, this is a very crucial issue. Limiting their access to public transportation.

Besides Trans-Yogyakarta, another public transportation that is also hard to reach by difabel is train. In Yogyakarta Railway Station (Tugu Station), the ramp entrance to the station is still too steep, and it can not allow it to be accessed independently by difabel. In the provision of public transportation for the difabel in Yogyakarta, the difabel is still positioned as an object, due to the fact that difabel are less involved in the process of providing the mass transportation in Yogyakarta.

B. Positioning Difabel as Transportation Subject

In Law No. 8 of 2016 on Disability, the central and local government is mandated to fulfill the 22 rights of the difabel, of which one of them is the right to access the inclusive public service. To fulfill these rights is certainly not an easy job for the government. Especially at this time not all local government can fulfill the rights of difabel as a priority agenda. It must be recognized that the Government of DIY has given the most attention in the fulfillment of the rights of the difabel. But the real conditions showed that there are still many barriers that make it difficult for the difabel to move independently. As a result, they are forced to work harder to be able to carry out daily activities.

Generally, the difabel in Yogyakarta have some of the following characteristics, namely: nearly 89% live in rural areas; came from a poor family (lack of socioeconomic and health level); low education level; low level of human resource productivity; additionally, some of difabel still have psychological problems such as not daring to leave their house because of shame, self-esteem, and fear; the persistence of social barriers such as discrimination in the family and society; and the existence of physical barriers, namely the unavailability of many public facilities, which are accessible for difabel. By looking at these characteristics, you can imagine how

they have a lot of problems in their lives. This leads to the difficulties when they get a job, and also influence the level of their welfare and independence. Though there exists the availability of the workforce with high quality still they will depend also on the presence or absence of employment opportunities [17]. Moreover, the disabilities that have a variety of impairments will also affect their chances of getting a good job.

Basically, the difabel are entitled to get a job in the formal sector. Based on Law No. 4 of 1997 in Article 14 mentioned that persons with disabilities (difabel) have a quota of one percent of every 100 people who work in an institution or company. In fact, according to Law No. 13 of 2003 on Labor Article 1 stated that the workforce including the difabel should be granted access. The Government of DIY has also responded to the publication of DIY Local Government Law No. 4 of 2012 on the Protection and Fulfilling the Rights of Persons with Disabilities. The result is now the Department of Manpower and Transmigration DIY noted there are about 23 companies which employ difabel based on monitoring conducted annually. But unfortunately the number of jobs and quotas provided in the formal sector is not proportional to the number of disabled in Yogyakarta. Thus, access to a job continues to be very limited.

Seeing this condition, it does not mean difabel will just accept their conditions. They will try to make other effort to change and improve their life condition. It is because every human is born and present in the world has many capitals, such as sense of purpose and organs that support their daily activities like: hands, feet, mouth, ears, eyes, and others [18]. Although, the difabel have different mental and physical conditions, it does not mean they do not have ability and motivation. This is perceived and performed also by Triyono who was the founder of *Ojek Difa*. Triyono had the experience of looking for work in the informal sector that would accept him. Triyono tried to apply for a job in on-line motorcycle taxi as driver who is currently emerging and developing in Yogyakarta. After registering, Triyono was rejected by the management Online Motorcycle taxi. Rejection occurred because his physical ability has limitations and he was not assessed in accordance with the standards of the driver who is wanted by the Management Online Motorcycle taxi.

Departing from Triyono's experience, Triyono did not give up and despair. Being a difabel for Triyono is the same as a normal person who can be active in their activities. Because of being difabel, which is limited only physical or mental, but it is not mean, he can not do anything. Triyono explained how he had found a job but it was so difficult. He is not to be pitied and isolated by his condition. He tried to move on and find another way

to solve his problem. Triyono tried to create other innovation in the field of public transportation, especially for the difabel. Furthermore, Triyono created innovative program by creating special motorcycle taxi for the difabel. To finance the operation of this motorcycle taxi, Triyono asked financial help from the company's Corporate Social Responsibility (CSR) fund. It is conducted in order to develop his plans that could be applied and useful to difabel. *Ojek Difa* service is expected to answer the needs of difabel in particular and will be a chance for others to get a job and income independently.

Interestingly, in the process of seeking financial funding, Triyono is not accepting donations from the government, state enterprises, or political parties. The goal is very simple, namely in carrying out the management of *Ojek Difa* be not burdened with the various agreements which can certainly reduce the rate of development *Ojek Difa* to go forward. So that convenience in the management of *Ojek Difa* is more central and becomes the basis of a service provider.

The name of Difa was adapted from the word of Difabel or in other words, differently abled. *Ojek Difa* started operations since 2015. In terms of transportation, the vehicle used by the motorcycle has been modified into a tricycle. Even for wheelchair users one can raise his/her chair on the passenger seat. Modifications were made designed to provide comfort and safety for drivers and passengers. Additionally for legality in driving, a driver of motorcycle taxi is required to have a driving license type D (SIM D). SIM D is published by the police that are specific to disabilities who meet the criteria in driving ability.

The rising popularity of *Ojek Difa* received a positive response from the various elements of society. As service users, groups with disabilities acquire shuttle service that allows them to interact with the community and the surrounding environment. Instead, as a service provider, driver of *Ojek Difa* can work through the provision of transport services. They no longer will be underestimated and social burden on society.

With the presence of *Ojek Difa* in Yogyakarta, the difabel group became the subject of inclusive development and no longer the object of inclusive development. They can contribute in providing accessible public transportation. Even now, the users or passengers of *Ojek Difa* are not only difabel persons, but the other persons who do not have special needs can also enjoy this service, ranging from teachers, physicians, board members, tourists, and others can enjoy when they are using this motorcycle taxi service. Thus, the longing for the realization of an inclusive public transportation can be realized by the presence of *Ojek Difa*. This innovation

moreover became a homework for the Government of Yogyakarta to be able to provide inclusive public transport services which is accessible for all of the people in Yogyakarta.

C. Pioneer of Inclusive Public Transportation Provider

Until now, *Ojek Difa* still remains the only public transportation service that is managed and piloted by the difabel. These motorcycle taxi services become a pioneer in providing inclusive public transport services in Yogyakarta. This initiative certainly can create independence of the difabel. In order to improve their service quality, *Ojek Difa* also becomes innovative and transformed by providing social media account such as Instagram, Facebook, Twitter, Blackberry Messenger, and Yahoo Mail in order to provide convenience services for drivers and users in whole destination around DIY.

The management of *Ojek Difa* will be launching online applications that can be used in smartphones. This application can be downloaded via Google Play and App Store. The device will connect server applications between the driver and the user (passanger). Use of this application is expected to facilitate communication for shuttle services addressing the needs of modernity and globalization. The shuttle service is intended to reach inside and outside the city of Yogyakarta. In addition, the *Ojek Difa* are also developing other business services. There are two kinds of other services offered to users, ie: massage services by blind people and cargo services both inside and outside of DIY. In addition, this *Ojek Difa* also provides additional services for guided tourism destination tours around Yogyakarta.

Figure 2. Physical Appearance of *Ojek Difa*



Source: www.difacitytour.com, 2016 [19].

In servicing rates were also relatively affordable. For shuttle service within the city there will be a charge of IDR 20,000 per five kilometers. If more than five kilometers, there will be additional cost of IDR 2,500 per kilometer. For massage services by blind people, the customers will be charged IDR 80,000 per hour. The cargo service will charge IDR 100,000. Furthermore, for

the service of city tours cost starts at IDR 100,000 per package, with a maximum of four hours and presently only goes to four main tourism places. If the passenger needs to go around Yogyakarta, they will be charged around IDR 50,000 to 100,000 depending on the location where they visited.

For those services, Triyono is applying the profit-sharing system which does not suppress the driver of *Ojek Difa*. For transport and cargo services, the management of *Ojek Difa* will take 10% and 90% is given to the driver. For the city tour service, the management company will take 30% and 70% is given to the driver. For the massage service, the calculation is slightly different. Because these services, masseurs will be escorted by a driver to the user. For an agreed outcome 10% for management, 10% for the driver, and 80% for massagers. Usually the masseuse is also from an empowered group of blind people who have expertise in massaging.

With the profit-sharing system, both the management, the driver, and users (passanger) will receive the same benefits and are not disadvantaged in this service. Overall the service is available in the *Ojek Difa* apps, so the users can become used to accessing the *Ojek Difa* application services. This innovative step will certainly participate in involving difabel in Yogyakarta for getting work and filling their days with productive activities. *Ojek Difa* can be pioneer in movement action of difabel community and are able to contribute to other difabel and society through these services. This has become one of the business transformation of public transport services that are very likely to be further developed for these applications are more friendly to the blind person, because, in this application there are no audio services that can be heard by the user. Applications *Ojek Difa* also became a pioneer in the online services for inclusive public transport in Yogyakarta.

The existence of *Ojek Difa* should be the trigger for the Government of Yogyakarta and all relevant stakeholders to provide more space for the difabel to participate in planning the provision of transport facilities and infrastructure in Yogyakarta. As quoted and submitted by Haryadi Suyuti as the Mayor of Yogyakarta, the goal states that: "to realize the inclusive city not only in the form of local regulations, but more important is the involvement of difabel in a development town process". Thus, the provision of inclusive public transport services into a major agenda for the government of Yogyakarta to be able to work with various stakeholders to realize that there is involvement of the difabel in the development of inclusion Yogyakarta.

D. *Ojek Difa* and the Javanese Local Wisdom

Yogyakarta is a province full of Javanese local wisdom. One such local wisdom is - *migunani tumraping liyan* - which means being useful for others. No matter how small the kindness we do can have great importance for others and be useful for fellow human beings and make life more meaningful. The Java philosophy embodies a deep philosophy. But usually society sees what is useful for each other as more or less meaningless. Sometimes we are not ready to do good, because we think that we have not been able to find any material or acts that we do that much impact for people in need. Or when we had plunged into our ego, which considers the pros and cons of each act, forgetting the fact that all creatures of this world form a unity, without limits of family, religion, gender, race and ability.

The presence of *Ojek Difa* is a real effort made by the difabel in Yogyakarta for give the benefit to others. Limitations experienced by difabel do not prohibit nor deter their determination to work and charity. Their conditions do not necessarily make them desperate and just expecting for mercy from others. They are not only claiming their rights as stated in Law No. 8 of 2016, but also they want to be able to actively participate in the fulfillment of these rights and be able to do this in such a condition that would make their action deemed more valuable. It can be concluded that the emergence *Ojek Difa* is in line and in harmony with the Javanese local wisdom - *migunani tumraping liyan* -. They are not only giving beneficial services for the difabel community, but also inspiration for the whole society.

V. CONCLUDING REMARK

A. Conclusion

Ease of mobility or access becomes one of the most important rights for the difabel to participate fully in social life. Supporting one to get this right is the presence of public facilities that are accessible to the difabel group on various modes of transport. But in reality, the provision of public transport services facility provides less attention to accessibility for difabel users as a service. As an example difabel still have difficult experience in accessing the Trans Jogja Bus independently. It is the caused by several factors such as the infrastructure is not accessible, the number of fleets are insufficient, and the affordability route problem.

The presence of *Ojek Difa* has opened access to mobility and space activities by and for the difabel. This mode of transportation as an alternative solution to meet the needs of public transportation is more inclusive. This service can be enjoyed by everyone without exception and is the only one inclusive public transportation in the world that is managed and piloted by the difabel. The

provision of public transport services of the difabel is in harmony with the Javanese local wisdom - *migunani tumraping liyan* - which means be useful for others. These initiatives through *Ojek Difa* have had some positive impact, not only to improve the social-economic welfare of the difabel, but also can give the benefit to participate in providing transportation facilities accessible for everyone.

B. Recommendation

Based on these results, there are some recommendations. First, to the Government of DIY, in an effort to encourage infrastructure and transport facilities that are friendly for the difabel in the policy-making process, the government must make inclusiveness as one of the indicators. Therefore, the government should involve difabel directly. The gains of involving the difabel, among others: (1) the difabel community can provide input to the government and learn to understand the government's ability to fulfill the rights of difabel; (2) influence the government to choose policy priorities in order to fulfill their rights; (3) difabel become active citizens, so that the feeling of neglect, not to be heard can be negated. In the same time, the process is to prevent social exclusion for the difabel. Thus, in the policy-making process of transport or other public facilities are appropriately respectful and sensitive to the needs of difabel.

Therefore, the government as a provider of public facilities needs to give attention and support innovations that have been made by *Ojek Difa*, for example: (1) provide the capital or soft loans without onerous agreement, for example in the development of the fleet; (2) provide for the training of traffic to driver of *Ojek Difa*; and (3) providing difabel-friendly infrastructure. Thus, public transport services will no longer discriminate against the difabel group. The emergence *Ojek Difa* in Yogyakarta hopes to inspire other local governments to replicate this innovation in their respective areas.

Second, we provide encouragement to society as a whole. Society should appreciate the innovative measures produced by the difabel. The society can show their appreciation to them so that there is no longer a negative stigma envisaged when interacting with difabel. Communities need to eliminate all forms of discrimination toward the difabel in various fields, not only in the field of public transport, but in other fields such as health, education, law, economics, employment, population, and so forth. Our shared goal is to create an equal relationship.

ACKNOWLEDGMENT

We would like to express our high appreciation to Center for Southeast Asian Social Studies, Universitas Gadjah Mada who was supported and funded this research. Furthermore, the researchers would thus like to express their gratitude to all our colleagues in the Department of Politics and Government, Universitas Gadjah Mada as well as in the Department of Islamic Management, Sunan Kalijaga State Islamic University, and all those who have entrusted them with the opportunity to conduct this researcher. The researchers hope that the result of this research can support further knowledge development regarding difabel and inclusive public transportation service in Yogyakarta.

REFERENCES

- [1] H. Krisdianto, "Data dan Fakta Difabel", *Tribun Jogja Newspaper*, Friday, March 18, 2016.
- [2] Ro'fah et al., "Kebijakan Berbasis Hak: Pengalaman Pemerintah DIY Dalam Penyusunan Perda Penyandang Disabilitas", *Welfare: Jurnal Ilmu Kesejahteraan Sosial*, vol 1, no 2, 2012, p. 278.
- [3] B. M. A. Kusuma and Z. Musyirifin., *Keberpihakan dan Kepedulian Lintas Iman Untuk Difabel*, Yogyakarta: Interfidei, 2016, p. 7.
- [4] H. Kurniawan, "Tipologi Renovasi Aksesibilitas Halte Trans Jogja", *Inklusi: Journal of Disabilities Studies*, vol 1, no 1, 2014, pp. 8-10.
- [5] C. Barnes and G. Mercer, *Illnes and Disability: Exploring the Divide*, Leeds: The Disability Press, 1996, p. 9.
- [6] M. J. Yulianto, "Konsepsi Difabilitas dan Pendidikan Inklusif", *Inklusi: Journal of Disabilities Studies*, vol 1, no 1, 2014, pp. 23-25.
- [7] Ro'fah et al., *Membangun Kampus Inklusif: Best Practices Pengorganisasian Unit Layanan Difabel*, Yogyakarta: PSLD UIN Sunan Kalijaga, p. xxiii.
- [8] M. J. Yulianto, "Konsepsi Difabilitas dan Pendidikan Inklusif", *Inklusi: Journal of Disabilities Studies*, vol 1, no 1, 2014, p. 26.
- [9] Ro'fah, "Antara Teks dan Interpretasi: Sebuah Upaya Melihat Disabilitas dalam Islam", in B. M. A. Kusuma and Z. Musyirifin, *Keberpihakan dan Kepedulian Lintas Iman Untuk Difabel*, Yogyakarta: Interfidei, 2016, p. 32.
- [10] L. P. Sinambela, *Reformasi Pelayanan Publik: Teori, Kebijakan, Implementasi*, Jakarta: Bumi Aksara, 2010, p. 5.
- [11] A. Dwiyanto, *Manajemen Pelayanan Publik: Peduli, Inklusif, dan Kolaboratif*, Yogyakarta: Gadjah Mada University Press, 2010, p. 129.

- [12] R. Common et al., *Managing Public Service: Competition and Decentralization*, Oxford: Butterworth Heinemann, 1993, p. 1.
- [13] H. Kurniawan, "Tipologi Renovasi Aksesibilitas Halte Trans Jogja", *Inklusi: Journal of Disabilities Studies*, vol 1, no 1, 2014, p. 2.
- [14] N. McNabb et al., *Qualitative Research Methods: A Data Collector's Field Guide*, Washington: Family Health International, 2002.
- [15] K. F. Punch, *Introduction to Social Research: Qualitative and Quantitative Approach*, 2nd Ed, London: Sage Publication, 2004.
- [16] M. B. Miles and M. A. Huberman, *Qualitative Data Analysis: A Source Book of New Methods*, London: Sage Publication, 1998.
- [17] A. Torrido, "Pengembangan Sumber Daya Manusia dalam Pembangunan dan Peran Dakwah", in W. A. Ghafur et al., *Interkoneksi Islam dan Kesejahteraan Sosial*, Yogyakarta: Department of Social Welfare UIN Sunan Kalijaga and Samudra Biru, 2012, p. 69.
- [18] W. A. Ghafur, *Kesejahteraan Sosial dalam Al-Qur'an: Konsep dan Paradigma*, Yogyakarta: Ladang Kata and Dakwah Press, 2014, p. 1.
- [19] Official Website of *Ojek Difa*, Main Page of *Ojek Difa* Website, Accessed through difacitytour.com on April 8, 2017.

The Effects of Ethiopia's Investment Policy and Incentives on Smallholding Farmers

Yonayad Gurmu¹, Sukhumvit Saiyosapon², Weerakul Chaiphar³

¹M.PA Candidate in Public Administration, Faculty of Humanities and Social Science, Khon Kaen University and Lecturer, Kalasin University,

E-mail: demgamachis@gmail.com

^{2,3} Assistant Professor, Lecturer, Faculty of Humanities and Social Science, Khon Kaen University,

E-mail: sukhumvt@kku.ac.th

E-mail: Chaiphar@gmail.com

ABSTRACT

Nowadays developing countries are highly attracting foreign investors especially who have food and biofuel energy demands. Surprisingly, the host country like Ethiopia, and coming in investors have similar interests. Ethiopia opened the door for investors laying primary objectives: to gain foreign currency, technology exchange, creating job opportunity, and food security. The country designed the investment policy toward drawing in investors with red carpet incentives in the investment policies and legal documents and transferred an earmark 7 million hectares of smallholding farmers' land. However, the objectives laid above left only being paper value without bringing into effect the promises. Nevertheless, the government inclined its focus only on earning foreign currency encouraging the investor to export or supply their product to the exporter. The article explores the issue at hand with the policy implementation theories, concepts, approaches, government documents and other references through thoroughly reviewed literature the effects the smallholding farmers facing under the investment policy and incentives. The article revealed that the challenges the smallholders facing under investment plan is worse than their past status quo. The policy and incentives favor the investors than smallholders and local people; dispossessing and displacing them from their land, lacks them food security, unemployment, low wage and sociocultural problems which resulted in reaction against the investors, crop fields, companies with fierce protests and resistances.

Keywords: implementation, incentives, investment policy, investor, smallholding farmer

I. INTRODUCTION

This reviewed article objective is to study the effects the Ethiopian investment and its incentives have on smallholding farmers. The article buckles down to show the consequences the investment policy the government, donor countries and organizations alluring have on smallholding farmers. The favor of the policy began with a lot of high talk about Ethiopia's economic progress in the last couple of years. Western leaders and media outlets were fascinated with Ethiopia's economic growth as the country opened her door and gave encouragement for the expansion of investment to strengthen the domestic production capacity and thereby accelerate the economic development of the country [37]. Since early 2008, the Ethiopian government has embarked on a process to award millions of hectares (ha) of land to foreign and national investors [21]. The

government claims that these investments will allow for much needed foreign currency to enter into the economy and will contribute to long-term food security through the transfer of technology to small-scale farmers. However, the economy of Ethiopia which generates over one-half (56%) of the country's GDP, 80% of the country's export earning, 85% of employment is an agricultural based economy of which the production is predominantly in the hands of smallholding farmers relying on their hands, some rudimentary tools and the fickle rains (Wiggins, 2009; Financial times, 2016). A mere 5 percent of agricultural output comes from big commercial farms [9].

The country modified investment policy in the last 20 years for more than four times to increase the inflow of capital and speed up the transfer of technology into the country (Ethiopian Investment Agency [6]. More, the country aimed to enhance and promote the equitable distribution of investments among regions and

benefit the society by ensuring competitiveness among investments made by investors. The system of supervision and administration of investment's transparency and efficiency are designed to put in place and ensure that the permits and incentives granted to investors are used for the intended purposes; attracting both domestic and foreign investors to flourish their capital, know-how and entrepreneurship in the country making all walks of life beneficiaries (Preamble of Investment Proclamation No. 769/2012).

Most importantly, the country on the recently released Growth and Transformation Plan (GTP), focused primarily on creating favorable investment climate among others to reach certain goals between 2011 and 2015 gearing towards ending poverty [18]. Within this plan, among others, bolstering smallholder farmers' productivity, enhancing marketing systems, upgrading participation of private sector, increasing volume of irrigated land and curtailing amount of households with inadequate food were the major one. In addition, the major objectives of investment policy promulgated in the preamble of the proclamation No. 769/2012; is to accelerate the country's economic development through exploitation of natural resources of the country, develop domestic market, increase foreign exchange earnings by enhancing exports and producing import-substituting products locally; and create job opportunities.

Despite the government claims, the smallholding farmers lose their land neither enjoyed what they have been promised. So far they didn't witness the food security or the employment after 7 million hectares of land transferred to investors. The investors have food insecurity and energy demand back home in addition to the encouragement government gave them via incentives, inter alia, to export the production or supply to exporter.

Accordingly, in this article the author tries to verify the effects the investment policy and incentives to investors have on smallholders and the latter's reactions against the policy's result in Ethiopia in general along with policy implementation concepts, theories, approaches based on reviewed literature.

1. THE CONCEPT OF POLICY IMPLEMENTATION

In defining the concept of policy implementation different scholars come up with different but similar ideas. Pressman and Wildavsky (1973) define implementation in terms of a relationship to policy as laid down in official documents. As cited in Paudel, referring to them, policy implementation may be viewed as a process of interaction between the setting of goals and actions geared to achieve them [26]. Policy implementation, both one-time efforts to transform decisions into operational terms and continuing efforts to achieve the large and small changes mandated by policy decisions, encompassing actions of public and private individuals or groups directed at achieving objectives set forth in policy decisions. Mazmanian and Sabatier (1979) defined policy implementation as the carrying out of a basic policy decision, usually incorporated in a statute, but which can also take the form of important executive orders or court decisions. Paudel put the authoritative decisions such as politicians, top-level bureaucrats, and others who are the most relevant to produce the desired effects as the starting point of policy implementation [24].

As quoted in Hill and Hupe, Matland argued that, successful implementation, requires compliance with statutes' directives and goals; achievement of specific success indicators; and improvement in the political climate around a program [10]. Compliance with legislation in the implementation of policy goes in line with the rule and due process of law. Besides this, Paudel signaled that the success of a policy depends critically on two broad factors: local capacity and will [24]. The institutional capacities in carrying out the policy have to be established and functioned accordingly. Not only that, the institutions should perform willingly. Paudel goes on explaining the questions of motivation and commitment (or will) that they reflect the implementer's assessment of the value of a policy or the appropriateness of a strategy. Motivation or will is influenced by factors largely beyond the reach of policy environmental stability; competing centers of authority, contending priorities or pressures and other aspects of socio-political milieu can also profoundly influence an implementer's willingness.

The above discussion conceptualizes implementation as a process, output and accomplishment. It is a process of a series of decisions and actions directed towards putting a prior authoritative decision into effect. Policy's value and appropriate

strategy have to take into consideration the capacity of local people and their will. Policy designer's final goal-top or bottom is to make sure that community is benefited from the policy. At the same time the local people have to be consulted on the designed policy before taking implementation into picture to recognize the due process of law. The essential characteristic of implementation process is the timely and satisfactory performance of necessary tasks related to carrying out of the intent of the law. This best embraced if the community at large involved in the making and implementation of the policy willfully without being enforced from anybody.

2. THEORIES OF POLICY IMPLEMENTATION

With the evolvement of implementation researches, two schools of thought developed as to the most effective method for studying and describing implementation policy: top-down and bottom-up. According to top-down approach, policymaker set certain goals and implementation is carried out by setting up certain mechanisms (Palumbo, D.J and Calista, 1990). The top-down view a highly prescriptive bent making policy goals clear and consistent, minimize the number of actors, limit the extent of change necessary and place implementation responsibility in an agency sympathetic with the policy's goals. This perspective describes the investment policy of Ethiopia as the later clearly sets policy objectives in its statutory and documents (Investment Proclamation No. 769/2012; EIA, 2014; MOFED, 2010; GTP 2010/11 – 2014/15), directly designed and adopted by top level officials without consulting the local communities and smallholders [21], taking control of the land from several regional government through the creation of the federal land bank, enforcing locals for the implementation and when face resistance use military force [21] The top officials focused on political decision-law- and punish whoever dissented or opposed the policy in the name of anti-development. Matland underlined that top-down approach theorist taking statutory language from the beginning fails them to consider the significance of actions taken in the policy-making process [11].

The Ethiopian investment policy and incentives concentration on generating foreign currency through encouraging investors on exporting their production fails them to consider broader smallholders need and public

interest [3, 34] It gave less protection to smallholders and local people than investors. The investment policy and incentives being opened door policy has clear, explicit, and consistent goals on transferring such huge land to investors with red carpet incentives contradicts much of what is known about how this legislation is passed with its rational background. This inevitably leads us to look at the formation of the current Ethiopian government and who is the main political power holder and policy maker. The country's government and power sharing system must be taken into consideration. The country's government and power sharing discussion necessitated for it goes with what Hill and Hupe said, "policy is made as it is being administered and administered as it is being made" [10]. Accordingly, Tigray People's Liberation Front (TPLF)¹ assumed leadership and still dominates national politics in Ethiopia. The Ethiopian People's Revolutionary Democratic Front (EPRDF)², which is made up of four major ethnic groups (Oromo, Amhara, Tigray and Southern Nation, Nationalities and People) pretends to have the power in the country, is seen as little more than a puppet of TPLF. Most of the ethnic group organizations "in power" were fabricated over night by TPLF in 1991 on their arrival to the capital-Finfinne (Addis Ababa)-with the intention of convincing the international community that all ethnic groups are represented [2]. The preferential treatment that Tigrayan investors seem to get when it comes to investment; getting land freely, and receive preferential access to credit shows the clear intention of the policy and incentives and its being top-down. Consequently, 75 percent of domestic investors in Gambella³ were from Tigray [20]. On the other hand, bottom-up theoretic approaches argue that a more realistic understanding of implementation can be gained by looking at a policy from the view of the target population and the service

1. A political party in Tigray region and currently the influential leader of Ethiopian government.

2. The ruling political coalition in Ethiopia. The front consists of four political parties; the Oromo People's Democratic Organisation (OPDO), Amhara National Democratic Movement (ANDM), the southern Ethiopian people's democratic Movement (SEPDM) and the Tigrayan People's Liberation Front.

3. Gambela Peoples' Region, is one of the nine ethnic divisions of Ethiopia. Previously known as "Region 12", its capital is Gambela

deliverer. According to this approach the policy implementation occurs on two levels-macro and micro implementation[4]. The central government devises the program; local organizations react to macro level plans, develop their own programs, and implement them. However, we don't witness such interactions in the case of Ethiopia as the smallholders and local communities have neither invited nor entitled to react on the designed policy and come up with their own programs for the implementation. The farmers and local community were not consented on the policy and not parcel of the program [27,15,2]. The street level bureaucrats only made to run the implementation without taking part in designing their programs of implementation. Instead the federal government designs the policy and then directly influences the locals and street level bureaucrats for the policy implementation up to using mighty military [2,15]. In addition, conditions, according to the bottom-uppers if local level implementers are not given the freedom to adapt the program to local conditions it will fail [22]. Local communities and smallholders have already started protesting and resisting the policy after witnessing its effects and the promise didn't happen. Smallholders problems, activities and contacts have to be asked to map a network that identify the relevant implementation structure of investment policy at local, regional and national levels and to evaluate the significance of investment policy and incentives with other influences.

3. ETHIOPIAN INVESTMENT POLICY AND INCENTIVES

The policy and conditions of leasing land to both foreign and domestic investors for commercial farming is labeled as "open door" as it is highly favorable to investors and does little to protect the environment and the rights of local people (Oakland Institute, 2011; Rahmato, 2011). In Ethiopia land is state owned property (FDRE⁴ Constitution article 40/3). However, under the investment policy the investors privileged more than lease right. One Indian investor claimed "...land is state property but government gives the rights by way of leases which are transferable, are renewable, which are pledgeable, in a lot of ways leases are tantamount to near ownership" (Quoted in Oakland

Institute, 2011). The policy opened the door to the extent that the government made purely commercial agreement with investor charging them only a dirt cheap rent. What they choose to do on the land for their own commercial intent is their own business. There are no governance, no constraints, no contracts, none of that between government or smallholders and investors [21]. It is obvious that in the absence of no governance, no constraints, and no contracts the smallholders would be driven into sea by both investors and policy of government. For the smallholders, it is difficult to stand with the challenges that would follow after they transfer the only thing they have-land! The government wants to see investment and then expects the advantage to be more than the land rent. The Ethiopian government claims that these investments will allow for much needed foreign currency to enter into the economy and will contribute to long-term food security through the transfer of technology to small-scale farmers. In the contrary, the investors that have given large-scale of land-the government is focusing on, have energy and food security interests which made difficult for the government to realize its objective of eradicating poverty out of his own population [15]. The investors are export oriented and investment policy and incentives intended to generate income from export and then satisfy food demand by purchasing; of which ischallenging and implausible to please locals', smallholders' or the whole communities' food insecurity.

Surprisingly, investment policy and incentives set free investors from requiring them to improve local food security conditions or to make production available for local population in any lease agreement. More, despite Ethiopia's endemic poverty, there are no mechanisms in place to ensure that these investments contribute to improve food security for smallholders and local communities. Nevertheless, numerous incentives assured food production for export to provide foreign exchange for the country at the expense of local food supplies.

New investment proclamation also provides a number of incentives to potential investors in different forms. Starting from minimizing the capital requirement for a single investment up to the highest tax exemption period-8 to 9 year-to investors engaged in forest development (Investment Proc. No. 769/2012; Regulation No. 270/2012). Foreign investors are also allowed to repatriate the profit and other incomes

4. The Ethiopian state nomenclature, Federal Democratic Republic of Ethiopia (FDRE)

acquired from their investment in convertible foreign currency (Article, 26). Investment regulation No. 270/2012 provides more details of the privileges given to foreign investors. In the detailed income tax exemption section, the Regulation states that investors engaged in agricultural investment outside of Finfinne (Addis Ababa)⁵ and Oromia⁶ Special Zone⁷ Surrounding Finfinne are entitled to 3-5 years of income tax holiday. The agricultural investment investors do in Finfinne (Addis Ababa) and the regulation is trying to give tax privilege is quite not clear as big agricultural investment in the capital may not be expected. Income tax exemption for an investor for almost for a decade would possibly made the country to lose the revenue supposed to be collected and thereby used for the wellbeing of the country.

As provided in article 5 of the same proclamation, an income tax deduction of 30% for 3 years after the expiry of the former exemption period are given to encourage any potential investors to engage in the least developed and relatively low population density regions who establish a new investment venture. Investors are also allowed to import duty free capital goods and construction materials for new investment venture and for expansion (Article, 13). Moreover, investors who export or supply to an exporter at least 60% of their products or service input are entitled to have 2 more years of income tax exemption (Article, 7). As raised above, from the very beginning investors have food and energy interest back home; added with incentives encouragement to export or supply to exporter their products or services left smallholders and local communities with food insecurity and promises unkept. Incentives coupled with global demand for farmland is expected to bring more investors eager to engage in large-scale farming at the expense of smallholding farmers.

Such a high incentives have effect both on the present and future benefits of the country and people. The above incentives highly inclined the investors to produce for export or supply to an exporter. Export oriented investment with tax privilege plausibly leave

the bare smallholders in dilemma of food insecurity, technological and economic advancement as the investors produce and ship out of the country, no tax and revenue is levied on what they import and export, hiring and firing workers is up to the investors, doing whatever they [investors] pleased on the leased land is their business, nothing is put in place in the lease contract to protect the interest of smallholders and local people, and assuming just to satisfy local needs and country's demand with the foreign currency will not help to forward and change the nations or smallholders life.

Giving incentives for the investors to come in to flourish their capital may seem normal in the eyes of investment policy implementation. However, the author agrees with the permits and balanced incentives granted to investors so long as they used for the intended purposes. Preserve the interests of smallholders and local communities, protect the environment, the ecology and culture, values and customs of the society, kept the promises, supported with plausible contract, integrate the local capacity and their wills, consultation and mechanisms to include them have to be set in advance. Otherwise its implication exceeds the benefits resulting in corruption, land grab, discrimination, protests, resistance, favoring one ethnic group which dominates the political power as the case of Tigrean investors in Gambella region. This would turn back the country into conflict, chaos, and destitute poverty if smallholders and local communities haven't seen themselves in the incentivized project running on their commercialized land and area.

4. EMPLOYMENT AND WAGE

Wage rates for smallholding farmers and locals hired in investment projects especially agricultural labor are low just 2/3 of what the smallholders working in the Productive Safety Net Program (PSNP) are earning [2]. While some of those employed are local, the majority of laborers were from different places resulting in conflict with the local. The investors pay low and don't care for the locals because according to investment policy it is up to the investor, who to hire [21]. In addition, the vast majority of projected employment figures involve large numbers of seasonal workers, to be employed during labor-intensive periods in the production cycle (harvesting, etc.). More, there is no employment security nor any means of wage upgrading for smallholders and local people hired in the project based on experience gained and/or longer service.

5 . Finfinne or Addis Ababa is the current capital city of Ethiopia

6 . Oromia is the single largest region in Ethiopia

7 .OromiaSpecial ZoneSurrounding Finfinne is one of the zones of the Oromia Region in Ethiopia surrounding the capital

Investment policy's target is supposed to create job opportunities and thereby make the smallholders beneficiary from the salary they earn. However, the wage they paid couldn't even live them on hand to mouth. At the policy-making process the targeted group were not taken into consideration, the real problem they face were not researched well, no guidance were included for investors how to treat smallholders and local communities in the lease contract. Comparing the life they were living before their land were taken and under investor made the smallholders and local communities to resist and protest the investment despite the government trying to protect investors' interest with mighty military. Concentrating on the statutory language, foreign currency inflow from export government fails to consider broader public objectives and the main reason for granting incentives in the policy implementation.

5. **FOOD SECURITY**

Since the fertile land are prime land investment areas because of ample water supplies and good soil fertility are already commercialized through the federal land bank, the area became the most food insecure though those areas weren't exposed to food insecurity before the investors came in (Oakland Institute, 2011). The wage labor they got even could not help them to afford food as the policy of the government encourages food production for export, the investors either shipped or sold at the market it pleases resulting in food price rise. The policy of investment and the incentives is among the underlying causes for food insecurity of smallholding particularly in the areas of intensive land investment [21]. Policy-formation process gives implementers important cues about intensity of demands, and about the size, stability, and degree of consensus among those pushing for change. Nevertheless, the policy gave deaf ear to the high demand of the smallholders although the government document boldly underline ensuring food security as its primary objectives in pleading investors to come in the country.

Previously, these households were largely self-sufficient with respect to food production. Now they will have to rely on assistance from others and will become more dependent on handouts from the government. Change in diet, loss of traditional lands, increased reliance on wage employment and aid, and weakened community bonds will also result from this livelihood

loss. The Oakland Institute came with a conclusion that, the adverse effect of investment policy's commercializing land on the lives of local people will be dramatic, long term, and potentially irreversible [21].

6. **SOCIOCULTURAL EFFECTS**

As the investment policy's objective is to create job opportunity, it resulted in massive influxes of laborers come from other areas of the country which have significant adverse effects on local communities and smallholders whose land is commercialized. These include: increased deforestation, decline in fish, wildlife, and other resources in the immediate area, conflict with local people, higher incidences of sexual assault, greater pressure on infrastructure, increase in prostitution (and subsequent spread of HIV and other STDs) and greater stresses on ecological systems (including water resources), cultural shock, unaccustomed to the local people life style [21].

Sociocultural effect happened because land is not only a fixed asset essential to produce sufficient amount of crop and animal to secure supply of food, but it is the foundation of identities (language, culture, & history) of communities living on the land. So far nothing is done from both sides-government and investors, in preserving the identity of smallholders and local communities whose land are commercialized. The government seeks foreign exchange while the investors slurping their profits using the red carpet opportunity created by the formers policy and incentives. Since the investors are guaranteed with the right who to hire, and what and how to do on the land; they don't bother for the local peoples' identity. This is one defect of the post-modern theory; ignoring believes, culture, values and identity of the society. On the other hand, postmodern theory gives more power to people through decentralization. However, on the issue at hand the policy making process and implementation deprived the power of local community and smallholders enforcing them to implement the policy top-downed. This brought adverse effect on practicing democratic principles and building developmental democratic state as government called itself. Since Ethiopia is a multi-ethnic and ruled by ethnic based federalism ignoring the assets of the later may cost the system.

7. DISPOSSESSING AND DISPLACING THE SMALLHOLDERS

Recent research shows that government's dispossession and displacing smallholders and local communities under the guide of investment policy and development have adverse effect on smallholders. Anderson and et al signaled the dangers and its effects in natural resource degradation, loss of indigenous farming practices, food insecurities, conflicts, neglects local rights, exploits natural resources and impoverishes farmers by not bringing about the promised benefits (Andersen & Robertson, 2010; Theting & Brekke, 2010; Kachika, 2010; Grain, 2008). Land certification and registration could not prevent public authorities from expropriating land and natural resources as the smallholder farmers have a weak, limited, conditional and subject to abrogation land right, at any time, in the name of investment policy the country adopted [2].

Most importantly, smallholders are dispossessed with inadequate, unfair compensation or not at all and displaced from to another area (Ramhato, 2011; Theting & Brekke, 2010). In the contrary, the compensation requirements are clearly stated in Ethiopian Proclamation No. 455/2005 outlining the procedures including the advance payment of compensation equivalent to the replacement cost of property on the land and any improvements (value of capital and labor) made to the land. In addition, displaced persons should receive 10 times their average annual income from the previous 5 years. Despite the favor of the law, to some extent, for adequate, fair and prompt compensation, the smallholders paid a minimum compensation or not at all for their land. Under investment coverage the government agents, brokers, including the investor uses smallholding farmer's land changing it into capital. In fact, both federal and regional governments are directly or indirectly behind the "land grabbing" (Kachika, 2010). In Legetafo, Oromia region, the smallholding farmer was paid 17 birr (\$0.80) a square meter in compensation while people were bidding as much as 355,555 birr (\$ 16,732) per square meter to rent land in in the capital (William D., 2016). While the land should be used at global, national and local levels efficiently taking into account all functions and making the entire population's long term interest stronger than the short-term interests of certain privileged groups (UN, 2002).

The research conducted by Oakland Institute shows *The Displacement Case of Gambella⁸ and Benishangul⁹*. Oakland Institute¹⁰ revealed that, all indigenous peoples in Gambella and Benishangul (approximately 45,000 households in Gambella and 90,000 households in Benishangul) were relocated from their ancestral lands to small villages of 400-500 households. The relocations are involuntary, if villagers did not move; the federal police would come and arrest them.

8. SMALLHOLDERS AND LOCAL COMMUNITIES REACTION

The smallholders and communities protested and resisted the policy not just because they have been displaced, evicted from their lands or were being threatened with displacement or eviction, but also because of the marginalization of identity-language, culture, history, denied employment opportunities and non fulfillment of other promises that investments were purported to bring [19]. On the other hand, the different ethnic nations under the effects of the investment policy and its incentives claim their land as a backbone since it is the only thing they have. As quoted in Moreda, studies conducted so far in the country related to the issue, though limited, show that adverse implications have already occurred to these indigenous communities and their environment and contend that this will likely worsen further in the future (e.g., Rahmato 2011, Kelbessa et al. 2009, Shete 2011, Fisseha 2011, Lavers 2012b). The local communities of different ethnic groups including the Oromo and Amhara who have faced land alienation or are being threatened by displacement or eviction as a result of current investment policies engaged in different forms of resistance in order to maintain their socio-cultural identities, self-administration, and economies (Walker 2008; Malseed 2008).

The ways in which smallholders and local communities of Oromo, Gumuz, Gambella, Amhara, Gedeo, Sidama have been reacting to the effects of the investments policies and incentives was peaceful and

8 . Also officially known as Gambela Peoples' Region, is one of the nine ethnic divisions of Ethiopia

9 .Also known as Benshangul/Gumaz, is one of the nine ethnic divisions of Ethiopia

10 . The Oakland Institute is a policy think tank dedicated to advancing public participation and fair debate on critical social, economic, and environmental issues.

later changed into conflict following the brutal crackdown of state. They reflected negative attitudes towards investors operating in their surroundings and several instances of covert expressions of resistance against them have occurred after their peaceful demand rejected by crackdown. Smallholders and local communities reacted to influx of migrant workers, field crops, companies, factories and farm machineries warehouse belonging to the investors, state's oppressive institutions like police stations, prison, court, offices and etc setting on fire [1]. As a result of the sabotage, machineries such as tractors, threshers, spare parts as well as many other valuable goods including factories and state's oppressive institutions were destroyed.

II. CONCLUSION

While the Proclamations and regulations proclaimed claimed to create transparency, make sure that the incentives provided used for the main objectives laid down, the top down policy implementation created a gap between smallholders and governments-what the smallholders and government want, found on the opposite side. The former's need technological change, food security, employment, land tenure, hold their identity, inter alia, while the latter is eagerly in need of foreign currency resulting in encouraging investors to ship abroad whatever produced on the smallholders' commercialized land. There are no governance; no constraints, no contracts, none of that to protect the smallholders' interest and make investors to keep promises. The government wants to see investment and then expects the advantage to be more than the land rent ignoring smallholders.

Investment policy and incentives the country adopted favors the foreign investors and domestic giving little protection to smallholders and local communities. The government claims that these investments will allow for much needed foreign currency to enter into the economy and will contribute to long-term food security through the transfer of technology to small-scale farmers. Instead of being beneficiaries from the investment policy and incentives the smallholders subjected to eviction, displacement, dispossession without or unfair compensation, losing their identity, marginalization, food insecurity, unemployment even if employed at minimum wage, unnecessary conflict, human right violation and etc. as both the government and investors didn't keep their promises.

Finally, the smallholders and local communities reacted in different tactics against the result of the investment policies and its incentives. They reacted to the investors, damaged field crops and means of production, resisted the immigration of seasonal laborers, and damaged the oppressive state's institutions.

REFERENCES

- [1] Al Jazeera News and Agencies. Foreign firms attacked as Ethiopia protests continue. Al Jazeera News, 2016. Retrieved from <http://www.aljazeera.com/news/2016/09/firmsattacked-ethiopia-protests-continue-160902064459286.html>
- [2] Araya, M. Effects of Large-scale agricultural investments on smallholder farming in Sub-Saharan Africa (Case study: Ethiopia). Lund University Libraries, 2013. Retrieved from <https://lup.lub.lu.se/student-papers/search/publication/4194906>
- [3] Bekele M, Tesfaye Y, Mohammad Z, Zewdie S, Brockhaus M and Kassa H. The context of REDD+ in Ethiopia. 2015. Center for International Forestry Research 127, 1-94. DOI:10.17528/cifor/005654
- [4] Berman, Paul. The Study of Macro and Micro Implementation of Social Policy. Santa Monica, CA: RAND Corporation, 1978. Retrieved from <http://www.rand.org/pubs/papers/P71.html>.
- [5] Davison, W. "Evictions Unrest Cast Shadow over Ethiopia's Construction Boom." Bloomberg, 2016. Retrieved from <https://www.bloomberg.com/news/articles/2016-03-21/evictionsunrest-cast-shadow-over-ethiopia-s-construction-boom>
- [6] Ethiopian Investment Agency, Overview of Ethiopian Investment Opportunities and Policies, 2014. Retrieved from <http://www.flandersinvestmentandtrade.com/export/sites/trade/files/news/127140508115349/127>
- [7] Ethiopian Investment Agency, 2013. Overview of Ethiopian Investment Policy. Retrieved from <http://mci.ei.columbia.edu/files/2013/10/Invest-in-Ethiopia-Focus-Mekele-by-EIA.pdf>
- [8] Expropriation of landholdings for Public Purposes and Payment of Compensation

- Proclamation No.455/2005. Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia, 11th Year No.43 (July, 2005)
- [9] Financial T. The great land rush Ethiopia: The billionaire's farm. The Financial Times. 2016. Retrieved from <https://ig.ft.com/sites/land-rush-investment/ethiopia/>
- [10] Hill M. & Hupe P. Implementing Public Policy. 2002. Journal of Social Policy, 33, pp. 154–155. DOI: <https://doi.org/10.1017/S004727940322728817>
- [11] Investment Proclamation, No. 769/2012. Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia, 18th year No.63 (September, 2012).
- [12] Investment Proclamation, No. 769/2012. Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia, 18th year No.63 (September, 2012).
- [13] Investment Regulation No. 270 /2012 .Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia, 19th year No.4 (November, 2012).
- [14] James Keeley, Wondwosen Michago Seide, Abdurehman Eid and Admasu Lokaley Kidewa (2014) Large-scale land deals in Ethiopia: Scale, trends, features and outcomes to date London: IDRC and IIED
- [15] Kachika. Land Grabbing in Africa: A review of the impacts and the possible policy responses, Oxford, Oxfam International Pan African Programme. 2010.
- [16] Lavers, T. (2012b). Patterns of agrarian transformation in Ethiopia: State-mediated commercialization and the 'land grab'. Journal of Peasant Studies, 39 (3-4), 795- 822.
- [17] Matland, Richard E., Synthesizing the Implementation Literature: The Ambiguity-Conflict Model of Policy Implementation. Journal of Public Administration Research and Theory: J-PART, 5(2), 145-174. Retrieved from <http://www.jstor.org/stable/118167418>, 1995.
- [18] Ministry of finance and economics of the federal democratic republic of Ethiopia, (2010). The Growth and Transformation Plan. The Ethiopian government five year plan. Retrieved from http://www.ethiopians.com/Ethiopia_GTP_2015.pdf
- [19] Moreda T. Listening to their silence? The reaction of the Gumuz people against large-scale land acquisitions in Benishangul-Gumuz region, Ethiopia. 2012. Retrieved from http://web.isanet.org/Web/Conferences/FLACS_OISA%20BuenosAires%202014/Archive/19e58c7b-6443-4029-a067-823ebb62b29e.pdf
- [20] Oakland Institute. Understanding Land Investment Deals in Africa Country Report:Ethiopia, 2011.
- [21] Oakland Institute. We say the land is not yours breaking the silence against forced displacement in Ethiopia, 2015.
- [22] Palumbo, D.J and Calista, Implementation and Policy Process: Opening Up the Black Box. New York: Greenwood Press. 1990.
- [23] Palumbo, Maynard-Moody, and Wright. Measuring degrees of successful implementation: Achieving policy versus statutory goals. Evaluation Review. 1984 8,(1),45-74
- [24] Paudel Raj Narendra. A Critical Account of Policy Implementation Theories: Status and Reconsideration. 2009. Retrieved from <https://www.scribd.com/document/234189086/Paudel-2009-a-Critical-Account-of-Implementation-Theories>
- [25] Pressman, J. L. and Wildavsky, A. Implementation: How great expectation in Washington are dashed in Oakland: 3rd ed. Los Angeles, London: Berkeley: University of California Press. 1984.
- [26] Pressman, J.L & Wildavsky, A. Implementation in the public sector, past, present and future. 1973.
- [27] Rahmato. Land to Investors: Large-Scale Land Transfers in Ethiopia. Forum for social studies.2011. Retrieved from http://www.landgovernance.org/system/files/Ethiopia_Rahmato_FSS_0.pdf
- [28] Robertson, B. & Pinstrup-Andersen, P. Food Sec. (2010) 2: 271. Doi: 10.1007/s12571-010-00681.
- [29] Sabatier, P. and Mazmanian, D" The Conditions of Effective Implementation: A Guide to

- Accomplishing Policy Objectives" in *Policy Analysis* 5. . 1979.
- [30] The Constitution of the Federal Democratic Republic of Ethiopia, Proclamation No. 1/1995. Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia, 1st Year No.1 (August, 1995).
 - [31] The Food and Agriculture Organization of the United Nations (FAO). Can the smallholder model delivers poverty reduction and food security for a rapidly growing population in Africa? (Working Paper No.8). Rome: S. Wiggins 19. 2009.
 - [32] The White House, Office of the Press Secretary. Remarks by President Obama on Ethiopia in Joint Press Conference. Retrieved from <https://www.whitehouse.gov/the-pressoffice/2015/07/27/remarks-president-obama-and-prime-minister-hailemariam-desalegn-ethiopia>
 - [33] Theting & Brekke. Land Investments or Land Grab? A critical view from Tanzania and Mozambique. Spire, Oslo. 2010.
 - [34] United Nation. Investment and innovation policy review Ethiopia. United Nations. 2002.
 - [35] Van Meter, Donald S., and Van Horn, Carl E.. "The Policy Implementation Process: A Conceptual Frame-work." Administration and Society. 1975.
 - [36] Walker, K. (2008). From covert to overt: Everyday peasant politics in China and the implications for transnational agrarian movements. *Journal of Agrarian Change*, 8 (2 & 3), 462-
 - [37] World Bank. Ethiopia's Great Run The Growth Acceleration and How to Pace It (99399). 2016. Retrieved from <http://documents.worldbank.org/curated/en/693561467988949839/pdf/99399-REVISED-PUBLIC-ethiopia-Economic-Update-2-11-16-web>.



Engineering and Technology



Mocaf (Modified Cassava Flour), Cornmeal (*Zea mays* L.), and Jackbeen Flour (*Canavalia ensiformis*)-Based Analogue Rice as a Functional Food to Reduce Rice Consumption in Indonesia

¹Anis Septiyani Sholichah, ²Amirahanin Nafi'ah, ³Ismira Widiastuti, ⁴Adie Bayu Putra, ⁵Achmad Ridwan Ariyantoro

¹²³Department of Food Science and Technology

⁴Department of Agro Technology

⁵Lecture of Food Science and Technology Department
Faculty of Agriculture, University of Sebelas Maret
Surakarta 57126, Indonesia

amirahaninnafiah@gmail.com

ABSTRACT

The Indonesian needed of paddy rice is very high up to 139.5 kg/capita/year, it is twice of the world rice consumption; 60 kg/year. On the other hand, public demands a product that has functional value as a health nutrition. A solution to reduce the number of rice consumption and a health improvement is mocaf, cornmeal, and jackbeen flour-based analogue rice. The content of antioxidants, protein, and low glycemic index in analogue rice is able to create a functional food product. The purpose of this research was to know the nutrient content and the best formulation which acceptable to panelists. The analysis conducted consists of the physical, chemical and sensory test. Analogue rice is made into three formulations with ratio mocaf : cornmeal : jackbeen flour = 50%:40%:10% (F1), 40:40%:20% (F2), and 30%:40%:30% (F3). Based on sensory analysis, the best formulation of analogue rice is F1. It moisture contents of 7.367%; 0,556% ash contents; 6.904% protein contents; 4.308% fat contents; 80.223% carbohydrate contents; 24.728% amylose contents; HCN contents of 4.267 ppm; and 9.043% antioxidant levels. The higher percentage of jackbeen on rice analogue formulation effected the higher content of its protein and antioxidant. However, the panellists acceptance level decreased.

Keywords: Analogue-Rice, Mocaf, Cornmeal, Jackbeen.

I. INTRODUCTION (HEADING 1)

The dependence of Indonesian people on rice is very high at 139.5 kg / capita / year, twice bigger than the world rice consumption of 60 kg / year ^[1]. It is noted that during the last five years Indonesia has imported rice by 1,430,273 tons/year ^[2]. This continuous import policy will undermine Indonesia's position within the ASEAN Economic Community. Therefore, it is needed an effort to suppress the import of food products, especially rice. On the other hand, the public awareness of the increased health demands a product that has functional value. The solution to answer this problem is analog rice.

Analog rice has similar shape like paddy rice, so it is believed that it will be more easily accepted by the community. In addition, analog rice also has better nutritional value than regular rice^{[3][4]}. Mocaf is chosen as one of the raw materials of analog rice because the calories are close to the rice calories and the

carbohydrate content is quite high (> 80% of the dry weight)^[5]. To enrich the content of protein and antioxidant in the analogue rice, it is substituted by

jackbeen flour. Jackbeen is one of the been type that can be used as a source of vegetable protein with 55% carbohydrate content and 24% protein. Meanwhile, the addition of corn flour in analog rice is to improve the texture, color and aroma. The corn flour used is expected to reduce the stickiness, because it contains high enough fat of 4.6% ^[6].

The carbohydrate and protein content in the chemical composition of jackbeen opens new opportunities to exploit the jackbeen as a raw material for protein rich flour (PRF) ^[7]. According to Istiani ^[8], in the white jackbeen, there is an active component of flavonoids of 29.3mg/100 gram of seed flour, the total phenol is of 245.5 mg / 100 gram seed flour the antioxidant activity in the whole jackbeen is 47.13%. Antioxidants in this jackbeen seed will ward off free radicals that are detrimental to health. Other functional sides of analog rice that can be used as alternative staple food by people with diabetes mellitus because the ingredients used have a low glycemic index, ie cornstarch 33 ^[9], jackbeen flour 40,71- 44,05 , and mocaf 46 so that the estimated glycemic index of analog rice is in the range of 33-46 (below 55, including low IG).

II. EXPERIMENTAL METHOD

A. Materials and Equipment

In this study, the main ingredients used are mocaf (modified cassava flour) produced by PT Bangkit Cassava Mandiri, cornmeal produced by PT Kediri Matahari Corn Mills, Central Java and jackbeen (*Canavalia ensiformis*) obtained from local market in Surakarta. In addition to the main ingredients, the production of analog rice also needs other ingredients; water, cooking oil, salt and GMS (glycerol monostearat) obtained from CV An Nahlah Jember. The machine used to make analog rice is double screw extruder with hot extrusion method.

B. Processing of Analogue Rice

Mocaf, cornmeal, and jackbeen flour are mixed in accordance with the formulation for 5 minutes in the mixer. Then the emulsifier is prepared comprising oil, GMS, water, and salt mixed in the mixer for 5 minutes until homogeneous. Then, the homogeneous dry material is mixed with emulsifier solution and mixed for 5 minutes until dull, then the dough is put in a hot extruder machine with 20-21 Hz of adjusting speed, 40-42 Hz of screw speed and 15,43 Hz of cutting speed which will automatically cut up the material to resemble grains of rice. In the hot extruder machine, the analog rice dough will be heated twice; for the first heating, the material is heated to 85°C and for the subsequent heating, the material is heated with 75°C temperature, so that the grains of rice produced have experienced gelatinization optimally and produce wet grains of rice. Furthermore, the process of drying is used with the help of sunlight.

C. Chemical composition of analogue rice

1. Proximate analysis in analogue rice

Analogue rice samples were estimated for their moisture with thermogravimetric method by Sudarmadji^[10], ash by AOAC^[11], fat with soxhlet extraction by Sudarmadji^[10], protein content with kjeldahl method by Sudarmadji^[10], and carbohydrate by difference.

2. Amylose content in analogue rice

The method of amylose content is described by Apriantono^[12]. 100 mg of sample was added 1 ml of 95% ethanol and 9 ml of NaOH 1 N solution into the test tube, then the mix is heated in a water bath at 95°C for 10 minutes. The starch gel solution was transferred into a 100 ml flask, then distilled water is added until the mark and it is homogenized. The solution is piped 5 ml into a

100 ml flask, then add 1 ml of acetic acid and 2 ml of iodine solution into the flask, distilled water is added. The solution was left for 20 minutes, and the absorbance is measured by a spectrophotometer at a wavelength of 625 nm. The sample of amylose content can be calculated by the following equation:

$$\text{Content Amilosa} = \frac{X \times FP}{\text{Weight Sampels}} \times 100\%$$

3. Antioxidant Level

The antioxidant level measured by DPPH method (Istiani, 2010). Sample preparation was done by weighing the sample as much as 100 mg then adding 10 ml methanol. The sample solution

was then closed and stirred (using vortex) until homogeneous. Then, let it stand for 24 hours.

How to make the test solution is by pipetting the sample solution as much as 0.1 ml, then adding 4.9 ml methanol and 1 ml DPPH solution. Then the solution is allowed to stand for 40 minutes. Furthermore, solution is stirred (using vortex) until homogeneous and its absorbance is measured at wavelength (λ) 517 nm as absorbance sample.

Antiradical activity is shown in a system of which the color changes from purple to yellowish. The solution color change showed DPPH free radical capture activity and can be measured by the difference of absorbance produced in the sample compared with the control. Antiradical activity is expressed in the form of percentage of DPPH radical capture and is calculated by the equation:

$$\text{Antioxidant activity} = \frac{\text{Absorbance Sampels}}{\text{Absorbance Control}} \times 100\%$$

4. Cyanide content (Sudarmadji *et al.*, 2006)

4 grams samples plus 125 ml aquades and 2.5 ml chloroform were put in the kjeldahl flask and were distilled. HCN is absorbed in 2% KOH to get total volume as much as 20 ml. It is taken 5 ml from the solution and is added with 5 ml alkaline picric acid then is put in a test tube, then it is put in a waterbath containing boiling water for 5 minutes. The absorbance is measured at a wavelength of 520 nm. The

concentration is calculated from the standard curve obtained.

$$\text{Levels of cyanide acid (ppm)} = \frac{X \times FP}{\text{Weight Sampels}} \times 10^4$$

D. Physical Properties

1. Color

The color of analogue rice was estimated by chromameter CR 300 Minolta suggested by Firmansyah^[13]. Measurement data can be either absolute value or the value of difference with the standard. The analysis result of the color test is then converted into the °Hue value. The obtained °Hue values are then adjusted to the table of range color area of chromatization. The conversion formula of L*ab value to °Hue value is as follows:

$$^{\circ}\text{Hue} = \tan^{-1} (b/a)$$

2. Cooking time

The cooking time was measured by Oktaviani^[14]. The analog rice that will be cooked is washed once. Then the analog rice is put into container and it is added cold water with the ratio 1:1 between analog rice and water (water seperes with rice). Then, let stand of 10 minutes, until the water is completely absorbed. After the water is fully absorbed, the analog rice is steamed until cooked.

3. Water absorption

The water absorption method described by Dewi^[15]. 10 grams sample is weighed then soaked in warm water for 5 minutes then lifted and drained. The sampel is then weighed again. Water absorption is determined by the equation:

$$\text{DayaSerapAir} = \frac{B - A}{A} \times 100\%$$

A = sample weight before immersion (gr)

B = sample weight after immersion (gr)

E. Sensoris Analysis

Sensory analysis of analogue rice was conducted by 30 untrained panelists consisting of male and female. Sensory analysis is performed on raw analogue rice with color and appearance parameters, meanwhile cooked analog rice with taste, aroma, and texture parameters. The method used is favorite test (scoring)^[16].

F. Stastical Analysis

The experimental design used in this research is Complete Randomized Design with one factor that is variation of mocaf composition, cornmeal and

jackbeen flour as the basic materials for making analog rice. Each treatment was done two replications of the sample and three replications of analysis. Sensory analysis data were then analyzed statistically by one way ANOVA method. If it shows different result, then it will be continued with the test using Duncan's Multiple Range Test (DMRT) analysis at significance level $\alpha = 0,05$.

III. RESULT AND DISCUSSION

A. Chemical composition of analogue rice

1. Proximate analysis in analogue rice

In table 3.1.1 it can be seen that the comparison of moisture, ash, protein, fat, and carbohydrates contained in analogue rice (with the formula of F1, F2 and F3) with *sosoh* rice.

Tabel 3.1. Proximate Analysis of Analogue Rice and Beras Sosoh

| Nutrient Content | Analogue Rice | | | Sosoh |
|------------------|---------------------------|---------------------------|---------------------------|--------|
| | F1 | F2 | F3 | Rice** |
| Moisture (%wb) | 7,367 ^{ab} ±0,96 | 6,678 ^a ±0,10 | 7,488 ^b ±0,38 | 11,22* |
| Ash (%db) | 0,556 ^a ±0,12 | 0,857 ^b ±0,06 | 0,973 ^b ±0,24 | 0,58 |
| Protein (%db) | 6,904 ^a ±1,32 | 7,193 ^{ab} ±1,48 | 8,579 ^b ±0,58 | 6,61 |
| Fat (%db) | 4,352 ^a ±0,20 | 4,369 ^a ±0,23 | 4,533 ^a ±0,68 | 0,98 |
| Carbohydrates | | | | |
| (%db) | 80,223 ^b ±1,19 | 80,422 ^b ±1,58 | 77,860 ^a ±0,94 | 79,34 |

Source : ** [28]

* [27]

Moisture content in the food is one of the things that determine the durability of food, the lower the moisture content, the slower the growth of microorganisms, so that the food can be durable.

Based on Table 3.1 it is known that the moisture content between F1 is not significantly different from F2 and F3. It means that there is no significant influence on both formulations. Meanwhile F2 is significantly different from F3, it can be interpreted that there is influence from both formulations. Moisture content is affected by the drying process, the amylose of the material and the moisture of the raw material. In this case, raw materials are mocaf, cornmeal and jackbeen flour. Mocaf has max 13% moisture content^[17], 12,14% cornmeal^[18] and 6,43% jackbeen flour.

Ash content indicates that the mineral content contained in a material. The ash content in F1 is

significantly different from that of F2 and F3 which can be interpreted as having effect on both formulations. Meanwhile, F2 is not significantly different from F3, so it does not have significant effect on both formulations. Compared with ash content of sosoh rice which is only 0.58, the F1 analog rice is lower than ordinary rice, while F2 and F3 have higher ash content. The addition of jackbeen flour is considered to have effect on increasing ash content of analog rice. The ash content is influenced by ash content of raw materials used. The ash content of the jackbeen flour itself is 2.11%. It is higher than the mocaf ash content which is only max. 0.2% and corn ash content which is 0.62%.

Protein is an important food substance for human body because in addition to functioning as fuel in the body, it also serves as builder and regulator substances. Protein in F1 is not significantly different from F2 and F2 is not significantly different from F3 which means that there is no significant influence on the formulation. Meanwhile F1 is significantly different from F3 which means that there is an influence from both formulations. Protein content of mocaf, cornmeal and jackbeen flour based analog rice increased from F1, F2 and F3 respectively 6.904%, 7.193% and 8.579%. This is most likely due to the raw material used for the production of analog rice that has different protein content. The addition of jackbeen flour to the production of analog rice affects the protein content of the analog rice. Jackbeen has high protein content of about 30.36% and jackbeen flour has protein content of 18.59%^[19]. So that the addition of jackbeen flour on the production of analog rice is able to increase the protein content of the analog rice produced. Compared with sosoh rice which has protein content of 6.61%, the protein levels of F1, F2 and F3 have higher protein content than sosoh rice.

Talking about fat content in three formulations of analog rice based on mocaf, cornmeal and jackbeen flour, the fat content produced in F1, F2 and F3 is 4.352%, 4.369%, and 4.533%. The three formulations are not significantly different, it means that there is no significant influence on the three formulations. If compared with sosoh rice, the fat content of analog rice is higher than the fat content in ordinary rice which is only 0.98%. The high fat content is considered due to the addition of oil and corn flour which has fat content of 4.6%. The content of fat in corn flour is greater than the fat content of mocaf which is max 1% and that of jackbeen of 0.2-3%.

The values of carbohydrate in each formulation of carbohydrate of F1 equals to 80,223%, F2 equals to 80,422%, and F3 equals to 77,816%. F1 and F2 are not significantly different, there is no significant influence on both formulations. However, F1 and F2 differ

significantly with F3, it can be interpreted that there is a significant influence on the formulation. The carbohydrate content of the three formulations is quite high, because the raw materials used is mocaf, cornmeal, jackbeen flour which have high carbohydrate content as well. Mocaf's carbohydrate content is 85-87%^[17], corn flour's is 72.40%^[18] and jackbeen flour's is 56.74%^[23]. Carbohydrate content in sosoh rice is 79.34%. The content is lower than F1 and F2 of analog rice, while the F3 has lower carbohydrate content than sosoh rice.

2. Amylose content in analogue rice

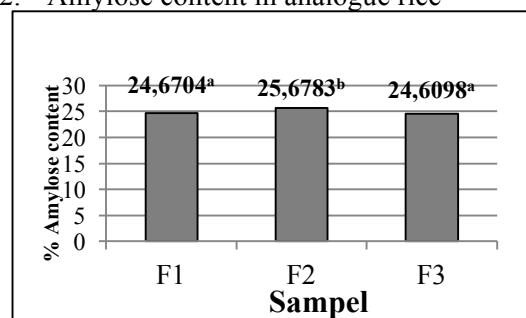


Figure 3.2.1 Amylose content in analog rice

Amylose has the ability to form hydrogen bonds with water^[21] and consists of glucose units attached to α 1.4-glycosidic bonds, so the molecule is in the form of open chain. As a result, amylose is easy to absorb water and release it or experience sineresis more quickly and experience crystallization. One of the chemical characteristics of rice which can characterize the physical characteristics of rice is the amylose content of rice. Amylose content of rice is usually determined to find out the smoothness level of rice. However, amylose content cannot establish the level of favorite because people's tastes of rice smoothness are different. One example is that the people of Sumatra tend to like rough rice while the people of West Java tend to like smooth rice^[4].

Based on Figure 3.2.1 it can be seen that the highest amylose content exists in F2 which is 25.6783%, and the lowest is in F3 which is 24.6098%. Of the three formulations, F1 and F3 are not significantly different, but significantly different from F2. If compared with sosoh rice which the amylose content is 20.65%, the amylose content of three analog rice formulations have higher amylose content. The analysis results of amylose content of analog rice are: F1 is 24,728% and F3 is 24,471%. Both are still included in rice with medium amylose content (20-25%) having moderate rice characteristic. Meanwhile, The amylose content of F2 is 25.546%, so that it is included in high amylose rice (25-33%)^[21].

According Suarni, amylose has high water binding ability that will affect the stability of viscosity and soft

tendency of the gel^[22]. More amylose contents will affect the hydration process which becomes faster and tends to increase its viscosity. However, it takes a high temperature and long time to reach gelatinization. Amylopectin has a lower water binding ability than amylose, so it affects the viscosity and consistency of the gel. The level of both starch-forming components influences the viscosity which will form the stickiness. Due to the amylose characteristic which is easy to bind water and easy to release water, in the drying process, analog rice with high amylose contents will more easily release water contained in the material so it has low water content.

3. Antioxidant level

In white jackbeen, there is an active component of flavonoids as much as 29.3mg/100gram of seed flour and total phenol is as much as 245.5 mg/100gram seed flour. Based on Istiani's research antioxidant activity in intact jackbeen is 47,13%. This antioxidant will ward off free radicals that are detrimental to health^[10].

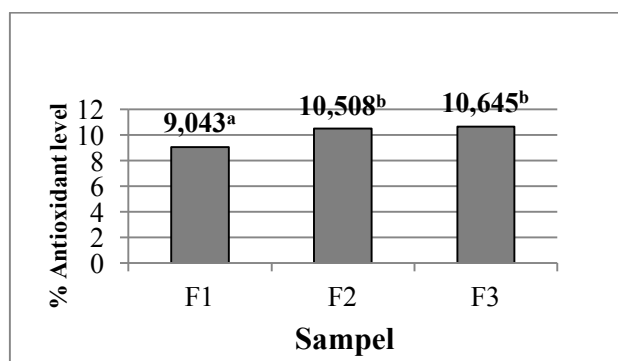


Figure 3.3.1 Antioxidant Levels of Analogue Rice

Based on Figure 3.3.1, it can be seen that F2 and F3 are not significantly different, it means that there is no significant influence on the two formulations, while F1 is significantly different from F2 and F3, it means that there is influence on the two formulations. The antioxidant contents decreased from raw seeds to become analog rice, raw seeds of jackbeen has 47.13% of antioxidant content^[10]. After experiencing various cultivation process, the antioxidant changes to 9,043%, 10,966%, and 10,645%. This decrease is due to various processes carried out in the production of analog rice, repeated heating process and the drying process which can lead to the decreased of antioxidants contents in the final product of analog rice.

4. Cyanide content

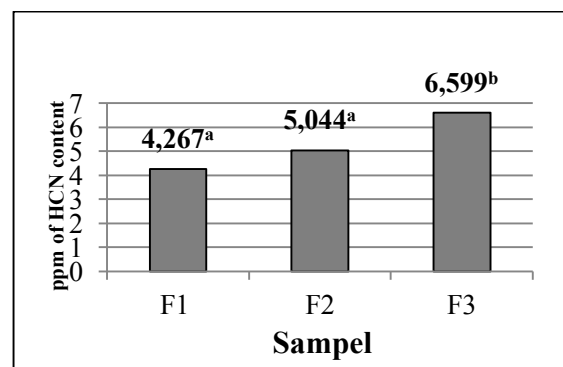


Figure 3.4.1 Cyanide content in Analog Rice

Based on Figure 3.4.1, the cyanide content of F1 and F2 is not significantly different, it means that there is no significant influence on the F1 and F2 samples, but F3 is significantly different from F1 and F2 which indicates the effect on the variation of the materials concentration used. From the figure above, the HCN level experienced an increase from F1 (4,267 ppm), then F2 (5,044 ppm) and the highest is in F3 (6,599 ppm). The more the composition of jackbeen flour added, the greater the cyanide content produced. The cyanide content of the analog rice is still categorized at safe level, because the maximum limit of HCN levels allowed by the Food Agricultural Organization (FAO) to consume is <10 ppm of cyanide acid^[23].

The preliminary treatment to jackbeen used is able to decrease the cyanide content. The preliminary treatment which is done by soaking process using 1% sodium bicarbonate solution, with water change every 8 hours and boiling for 30 minutes as well as the drying and heating process in the production of analog rice, can reduce the cyanide content of jackbeen. The content of jackbeen raw seeds is as much as 49.68 ppm^[19], after being processed into analog rice, the content ranged from 4 to 6 ppm. This is reinforced by Suciati, that cyanide acid is readily soluble in water, volatile when heated and cyanide acid may be toxic to the body if the content exceed 45-50 ppm^[24].

B. Physical Properties

Color

Color is one of the important attributes which determines consumer acceptance on a product. Color analysis is performed using Chromameter Minota CR 300 tool. This color analysis is used to determine the degree of white or brightness of rice based on the L value and color scheme of rice based on the values of

a and b. The value of L indicates the level of brightness of the sample. The brighter the sample which is measured, the closer the L value to 100. On the contrary, the duller (darker), the closer the L value to 0. The value of a is chromatic color measurement of red-green mixture. The value of b is chromatic color measurement of yellow-blue mixture.

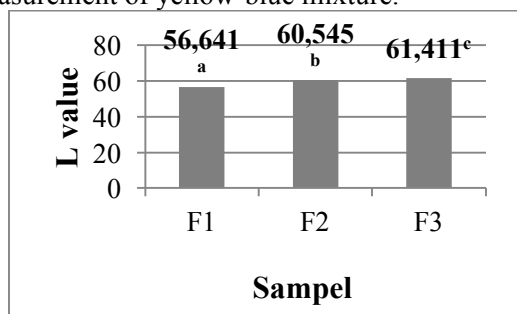


Figure 3.1.2 The L Value of Analog Rice

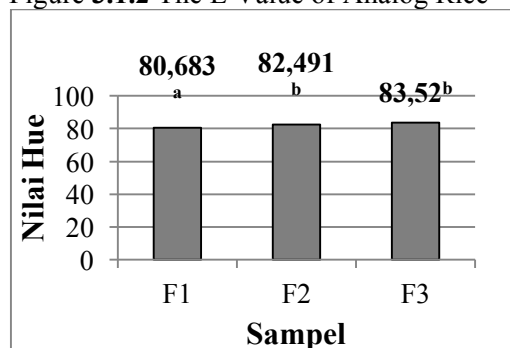


Figure 3.1.3 The °Hue Value Analog Rice

Figure 3.1.2 represents the L value of the analog rice showing the degree of degree of white or brightness. In the analog rice, the L value is 56,641 for F1, 60,545 for F2 and 61,411 for F3, the more the addition of jackbeen flour, the color of the analog rice tends to be cream color. If compared with ordinary rice which the L value is 80.79, analog rice has a lower degree of white or brightness level than sosoh rice. However, the value of °Hue is based on the value of + a and + b, the analog rice is around 54-90 color range which is included in the yellow-red color range. The addition of jackbeen flour, which has high protein content, causes browning reactions that occur due to mailard reaction; the reaction that occurs at the stage of steaming and drying. Mailard reaction is a reaction between carbohydrates, especially reducing sugars with primary amine groups. The reaction results in brown colored material, which is often desired or sometimes a sign of degradation^[25]. The existence of this mailard reaction of analog rice changes color from the bright yellow color to the faded yellow color towards the cream color.

Cooking time

Based on Figure 3.2.2 it can be seen that the three formulations of F1, F2 and F3 are significantly different, it means that there is significant influence on the three formulations. The more the content of jackbeen flour and the less the content of mocaf, the longer the cooking time will be and vice versa. This is related to water absorption, the higher the water absorption, the rehydration time is shorter and the cooking time will be longer, and the texture of the rice tends to be soft. Similarly vice versa when the absorption is low then the cooking time will be shorter and produce a texture of non sticky rice. Water absorption is also positively correlated with the time of cooking. Water absorption is the amount of water absorbed by the rice in the process of cooking. Water absorption varies for each rice variety. Both of these factors also determine the quality of the cooked rice and rice smoothness.

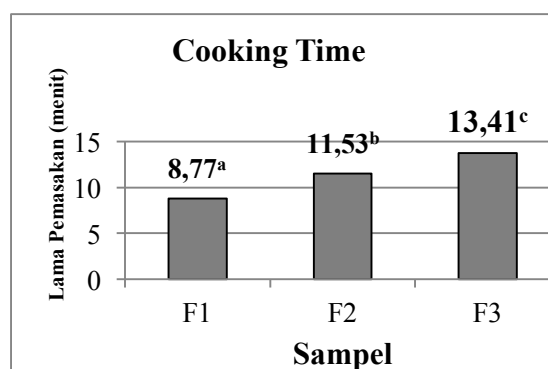


Figure 3.2.2 Cooking time of Analogue Rice

If compared with cooking time of sosoh rice, the time length of sosoh rice is longer than that of analog rice that is equal to 35,25 minutes.

Water Absorption

The value of water absorption is obtained from the amount of water absorbed per analog rice weight before immersion. Analog rice products experience some heating which cause starch to undergo gelatinization. Although these starch molecules can not return to their original characteristics before gelatinization, the dried starches are still able to re-absorb large amounts of water. This characteristic is the characteristic used to make instant rice and instant pudding able to re-absorb water easily by using starch that has undergone gelatinization.

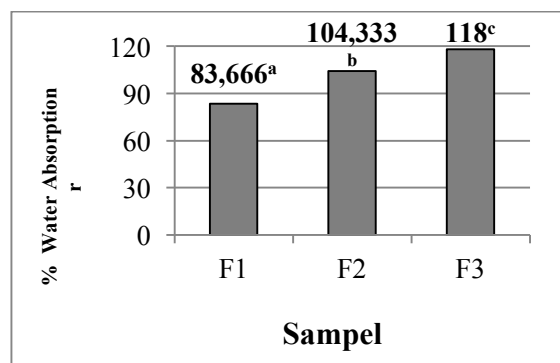


Figure 3.3.2 Water Absorption of Analog Rice

Based on Figure 3.3.2 it can be seen that the three formulations F1, F2 and F3 are significantly different, it means that there is significant influence on the three formulations. Based on water absorption viewed from the image, there is an increase of F1, F2 and F3. According to Pamularsih^[29], protein increase levels will lead to an increase in water absorption (WHC/Water Holding Capacity). WHC is influenced by the interaction between protein with water. These interactions are influenced by protein sources and amino acid composition, particle size and denaturation degree. Therefore the higher the addition of jackbeen flour, the more the water absorbed at rehydration time, so that the texture becomes more soft. The water absorption is related to the rate of rehydration. The research conducted by Suarni shows that the differences in water absorption are caused by the concentration of starch amylose, protein content and fat in starch^[22]. These three factors are the factors of absorption capacity of analog rice to the water. If compared with the sosoh rice, the water absorption capacity of rice is 24.3%, it is lower than the water absorption in analog rice.

C. Sensory analysis

Tabel 3.2 Sensory Analysis of Analog Rice Information :

- Score : 1 : absolutely dislike, 2 : dislike, 3 : neutral, 4 : like, 5 : absolutely like
- F1: 50% mocaf composition: 40% corn flour: 20% jackbeen flour
- F3: 30% mocaf composition: 40% corn flour: 30% jackbeen flour
- Control : Ordinary rice consumed by the community
- The same subset in the same column shows no significant difference at significance level of 5%

Overall, the panelist gives 3.3 for F1 which means neutral, 2.73 for F2 which means less favored, 3.00 for F3 which means neutral consumer acceptance. Overall, the addition of koro pedang flour to the analog rice production is less favored by panelists. In terms of color produced, the more the addition of koro pedang flour is, the paler the color is due to the browning reaction, pale cream color of analog rice is not favored by the panelist. In terms of flavor, the addition of koro pedang also less favored by the panelist. The bitter aftertaste is caused by Alkaloid compound as much as 0.614g/100g. This alkaloid causes bitter aftertaste on koro pedang flour^[26]. In terms of aroma parameter, the addition of koro pedang flour produces bad odor that is less favored by panelist, and in terms of texture parameter, the more the addition of koro pedang, the texture produced is more sticky, the shape is not similar to rice because at the beginning of the immersion process, the texture of analog rice had started to be broken.

IV. CONCLUSION

Based on the result of chemical analysis, the best physical appearance and sensory of analog rice is F1 with 50% mocaf formulation, 40% cornflour and 10% koro pedang flour. In the Chemical analysis, F1 has water content as much as 7,367%, ash content as much as 0,556%, protein content as much as 6,904%, fat content as much as 4,352%, carbohydrate content as much as 80,223%; amylose content as much as 24,6704%; HCN content as much as 4,267 ppm; and antioxidant content as much as 9.043%. The result of physical test of analog rice F1 is the color value in ohue which is as much as 80,683 lying around the yellow-red color, the water absorption is 83,666%, and the cooking time is 8,77 minutes. The more percentage of jackbeen on analog rice formulation, the higher content of its protein and antioxidant. However, the panellist acceptance level decreases.

| Sampel | Parameter | | | | | |
|--------|-------------------------|------------------------|-------------------------|-------------------------|------------------------|-------------------------|
| | Color | View | Taste | Smell | Texture | Overall |
| F1 | 3,40 ^b ±1,0 | 3,43 ^a ±1,0 | 3,17 ^d ±0,9 | 2,97 ^b ±0,8 | 3,27 ^c ±0,8 | 3,30 ^c ±0,8 |
| F2 | 2,93 ^{ab} ±0,8 | 3,17 ^a ±0,8 | 2,67 ^{bc} ±0,9 | 2,70 ^{ab} ±0,8 | 2,87 ^b ±0,7 | 2,73 ^b ±0,7 |
| F3 | 3,07 ^{ab} ±0,9 | 3,20 ^a ±0,9 | 2,90 ^{cd} ±1,0 | 2,73 ^{ab} ±0,9 | 2,83 ^b ±0,9 | 3,00 ^{bc} ±0,9 |
| R | 4,23 ^c ±0,8 | 4,30 ^b ±0,6 | 4,13 ^c ±0,6 | 3,93 ^c ±0,8 | 4,03 ^d ±0,6 | 4,20 ^d ±0,6 |

ACKNOWLEDGMENT

Special thanks to Department of Food Science and Technology and Departement of Agro Technology, Faculty of Agriculture, University of Sebelas Maret for their technical and material support.

REFERENCES

- [1] Hermanto, "Masyarakat Indonesia makan beras 139 kg/orang/tahun", *Tribunnews*, 31/10/ 2012.
- [2] BPS (Badan Pusat Statistik), *Data of Rice Impor Indonesia*, Jakarta: Badan Pusat Statistik, 2016, in press.
- [3] Budijanto, S., and Yuliyanti, "Study of sorghum sorbet preparation (*Sorghum bicolor l. moench*) and its application in the manufacture of analog rice, Studi persiapan tepung sorgum (*Sorghum bicolor l. moench*) dan aplikasinya pada pembuatan beras analog", *Journal of Agricultural Technology*, Vol. 13 No. 3 Desember 2012, p.177-186, in press.
- [4] Widara, S., "The study of analog rice production from various sources of carbohydrates using hot extrusion technology, Studi pembuatan beras analog dari berbagai sumber karbohidrat menggunakan teknologi hot extrusion", Faculty of Agricultural Technology, Institut of Bogor Agriculture, 2012, unpublished.
- [5] Hutami, F D., and Harijono, "Effect of replacement of solution and the concentration of NaHCO₃ to decrease the cyanide content of cassava flour processing, Pengaruh penggantian larutan dan konsentrasi NaHCO₃ terhadap penurunan kadar sianida pada pengolahan tepung ubi kayu", *Journal of Food and Agroindustry*, Vol. 2 No 4, 2014, p.220-230.
- [6] FAO, *Sorghum and Millets in Human Nutrition*. FAO Food and Nutrition Series, No. 27, 1995. FAO, Roma.
- [7] Windrati, W S., Achmad N., and Puspa D.A., "Nutritional properties of jack bean prf (*Canavalia ensiformis l.*), Sifat nutrisi Protein Rich Flour (PRF) koro pedang (*Canavalia ensiformis l.*)", *Agrotech*, Vol. 4, No 1, 2010, p. 18-26.
- [8] Istiani, Y., "Characteristics of isoflavone biochemical compounds and antioxidant activity test of tempe ethanol extract made from raw koro sword (*Canavalia ensiformis*), Karakteristik senyawa bioktif isoflavin dan uji aktivitas antioksidan dari ekstrak etanol tempe berbahan baku koro pedang (*Canavalia ensiformis*)", University of Sebelas Maret Surakarta, 2010.
- [9] Richana, N., Ratnaningsih, A.B., Arif, and Hayuningtyas, "Characterization of varieties of maize with a low glycemic index to support food security", *International Maize Conference in Gorontalo*, 2012, in press.
- [10] Sudarmadji, S, Bambang, H., & Suhardi, *Analysis For Food and Agricultural Materials (Analisa Untuk Bahan Makanan dan Pertanian)*, Yogyakarta: Liberty, 1997.
- [11] AOAC, *Official Methods of Analysis of The Association of Officiial Agriculture Chemist 16th edition*, Virginia: AOAC International, 2006.
- [12] Apriyantono, A., Fardiaz, D., Puspitasari, N.L., Sedarwati., and Budijanto, S., *Food analysis*, Bogor: IPB Press, 1989.
- [13] Firmansyah, Y. and Adawiyah, D.R., "Formulation of antioxidant functional instant beverages based on the effect of wood synergism secang against nutmeg and ginger, Formulasi minuman instan fungsional antioksidan berbasis efek sinergisme kayu secang terhadap pala dan jahe", 2003, unpublished.
- [14] Oktaviani, N., "Making smart rice based mocaf taro tuber and seaweed. Majoring in agricultural technology , Pembuatan beras cerdas berbahan dasar mocaf umbi talas dan rumput laut. jurusan teknologi hasil pertanian", University of Jember, 2013, unpublished.
- [15] Dewi, S. K., "Making of the instant cassava rice product based on fermented cassava flour as alternative staple food, Pembuatan produk nasi singkong instant berbasis fermented cassava flour sebagai bahan pangan pokok alternatif", Department of Food and Science Technology, FATETA IPB: Bogor, 2008, unpublished.
- [16] Setyaningsih, D., Anton, A., and Maya, P.S., "Sensory analysis to food industry and agro", *Analisis Sensori untuk Industri Pangan dan Agro*, Bogor: IPB Press, 2010
- [17] Subagyo, A., Windrati, W.S., Witono, Y., and Fahmi, F., "Standard Operating Production (POS): Cluster-Based Mocal Production (Produksi Operasi Standar (POS): Produksi Mocal Berbasis Klaster)", Jember: FTP UNEJ, 2008, in press.
- [18] Muhandri, T., "The chemical composition of local superior varieties of corn flour and its potential for making corn noodles using a printing extruder, Komposisi kimia tepung jagung varietas unggul lokal dan potensinya untuk pembuatan mi jagung menggunakan ekstruder pencetak", Department of Food and

- Science Technology, FATETA, Journal of Science Applicative, Ed. II, Vol - 2 (1) : 16–31, 2012
- [19] Azizah, Y. N., “The formulation and study of the characteristics of maize rice (*Zea mays l.*) Instant substituted green bean flour (*Phaseolus radiatus*), Formulasi dan kajian karakteristik nasi jagung (*Zea mays l.*) instan yang disubstitusi tepung kacang hijau (*Phaseolus radiatus*)”, 2013, unpublished.
- [20] Winarno, F.G., Food chemistry and nutrition, Kimia pangan dan gizi, Jakarta: Gramedia Pustaka Utama, 1998.
- [21] Winarno, F.G., Food chemistry and nutrition, Kimia pangan dan gizi, Jakarta: Gramedia Pustaka Utama, 2004.
- [22] Suarni., and Widowati, “Structure, composition, nutrition of corn, Struktur, komposisi, nutrisi jagung”, Bogor: Center for Agricultural Postharvest Research and Development, Bogor: Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, 2005.
- [23] Wahjuningsih S.B., and Wyati S., “Utilization of the jackbeen on the application of food products and economic analysis, Pemanfaatan koro pedang pada aplikasi produk pangan dan analisis ekonominya”, Riptek, Vol. 7, No. 2, 2013, Hal. 1-10.
- [24] Suciati, A., “The effect of long immersion and fermentation on hcn content in bean tempe (*Canavalia ensiformis l.*), Pengaruh lama perendaman dan fermentasi terhadap kandungan hcn pada tempe kacang koro (*Canavalia ensiformis l.*)”, Department of Food and Science Technology, Faculty of Agriculture, University of Hasanuddin, 2012, unpublished.
- [25] Winarno, F.G., Food chemistry and nutrition, Kimia pangan dan gizi, Jakarta: Gramedia Pustaka Utama, 2002.
- [26] Purnama, A.L., “The study of physicochemical and organoleptic characteristics knows substitution of the jackbeen (*Canavalia ensiformis*) with clotting of potassium sulphate (CaSO_4), Kajian karakteristik fisikokimia dan organoleptik tahu substitusi koro pedang (*Canavalia ensiformis*) dengan penggumpalan kalium sulfat (CaSO_4)”, Department of Food and Science Technology, Faculty of Agricultural, University of Sebelas Maret, 2013, unpublished.
- [27] Ohtsubo, K., Suzuki, K., Yasui, Y., & Kasumi, T., “Bio-functional components in the processed pre-germinated brown rice by a twin-screw extruder”, Journal of Food Composition and Analysis, 18, 303-316, 2005, in press.
- [28] United State Departement of Agriculture, “USDA National Nutrient Database for Standard”, 1997, Retrieved from http://www.nal.usda.gov/fnic/foodcomp/cgi-bin/list_nut_edit.pl, accesses on 13 Februari 2015.
- [29] Pamularsih, E., “Processing sago into instant sago pearls as an effort to diversify food, Pengolahan sagu menjadi sagu mutiara instan sebagai upaya diversifikasi pangan”, Faculty of Agricultural Technology, Bogor, 2006.

Phytochemicals, Quality and Glycemic Response Fern Red Herbal (*Stenochlaena palustris*)

Bernatal Saragih^{*1}, Henoch Tegar Prakoso², Anton Rahmadi³, Aswita Emmawati⁴, and Odit Ferry Kurniadinata⁵
^{1,2,3,4}Agriculture Product and Technology Agricultural Faculty Mulawarman University Jl. Paser Balengkong Po Box 1040

Kampus Gunung Kelua Samarinda East Kalimantan Indonesia 75119

⁵Agroecotechnology Program Study Agricultural Faculty Mulawarman University Jl. Paser Balengkong Po Box 1040 Kampus
Gunung Kelua Samarinda East Kalimantan Indonesia 75119

*Email: saragih_bernatal@yahoo.com

ABSTRACT

Red fern (*Stenochlaena palustris*) is an endemic plant that is widely present in open swamps and in tropical rainforests of Borneo. Fern is used as a vegetable by Dayak tribe and has potential for health. Therefore it is necessary to research the utilization of ferns as functional food with the addition of basil leaves as a natural flavor. The research method was performed using Completely Randomized Design (CRD) with a single factor with 6 treats of adding basil leaves of 5 g, 4 g, 3 g, 2 g, 1 g and as a 0 g control. The results of phytochemical analysis on fresh red fern positively contain alkaloids, flavonoids, hydroquinone phenols, steroids, and saponins. The addition of basil leaves has no significant effect on water content, ash content, hedonic and hedonic quality of color, hedonic and hedonic quality of aroma, hedonic and hedonic taste quality, color formation speed without stirring, color forming speed with stirring and color intensity. The best treatment is the addition of basil leaves as much as 5 g with water content of $16.37 \pm 4.88\%$, ash content of $0.95 \pm 0.004\%$, hedonic color like, hedonic quality of brownish red color, aroma rather like, hedonic quality basil-scented aroma, hedonic taste rather like, Hedonic taste very sweet, color formation speed without stirring 7.18 ± 0.75 minutes, color formation speed with stirring 24.85 ± 4.37 seconds, color intensity 0.76 ± 0.05 . EC₅₀ red fern herbal drink is 174,95 ppm. The healthy volunteers who drank a 150 ml red herbal fern drink with the addition of 10 g sugar had a lower glycemic response compared with a control drinking only 150 ml of water with 10 g of sugar added.

Keywords: Red Fern, Phytochemicals, Glycemic Response

I. INTRODUCTION

Increasing the public's attention to good health and food consumption will improve the utilization of functional food sources especially East Kalimantan local food utilization such as herbs onion tiwai based on research result Saragih *et al.* (2014^b) can lower cholesterol patients with hypercholesterolemia by drinking twice Daily in the morning and afternoon. Tiwai can also be used as food additives as food coloring (Saragih *et al.*, 2013; Saragih, *et al.*, 2017). Another plant that is widely used in East Kalimantan is ferns. Red fern (*Stenochlaena palustris*) is an endemic plant that is widely found in open swamps and in tropical rainforests of Borneo. This plant is widely spread in rural areas that have small rivers because the red fern also grows around the banks of the river. This plant has long been exploited by the people of Kalimantan, especially Dayak tribe as vegetables are consumed daily and is a nutritional intake for the Dayak tribe people. Red ferns have many health benefits because they are rich in antioxidants that are good for health.

To increase the useful value of red fern which has many health benefits it needs modern processing innovation that can be used practically and economically by society. One of them is processing red fern as a functional herb. However, the red fern has a disadvantage in terms of the resulting aroma if made as an herbal drink. Therefore, to overcome the problem of the lack of aroma of red fern herbs it is necessary to add a flavor of the plant that has a strong and dominant aroma.

Empirically Indonesian people take advantage of basil (*Ocimum sanctum* L.) to eliminate the unpleasant taste in the mouth, launch breast milk, fever, improve digestion, dilate blood vessels and prevent canker sores. While in China and India, basil is used to maintain health and increase the body's resistance to stress. The content contained in basil leaves are saponins, flavonoids and tannins. The isolated flavonoids in the basil leaf include vicenin, galutenolin, cirsilineol.

Basil leaves have neuroprotective activity, hypoglycemic, antioxidant, antibacterial and anti-inflammatory. Therefore, basil leaves and red fern herbal drinks potentially if used as a functional beverage that is practical to prevent various diseases. This study aims to determine the phytochemical, quality and glycemic response of red fern herbal drinks

II. METHODS AND MATERIALS

Materials

Materials research red fern, basil leaf, alcohol. Tools used such as measuring cylinders, test tubes, analytical scales, furnaces, ovens, desiccators, measuring pipettes, cuvids, spectrophotometers, glucose test kits (Accu Chek Active®).

Research design

This research is a single factor research which is arranged in Completely Randomized Design (CRD) with treatment of addition of basil leaves in red fern herbal, with 6 treatments and 3 replications. Treatment is the addition of natural flavor of basil leaves on red fern B0 = 0: 5 (basil: red fern) B1 = 1: 5 (basil: red fern) B2 = 2: 5 (basil: red fern) B3 = 3: 5 (basil : Red fern), and B4 = 4: 5 (basil: red fern) B5 = 5: 5 (basil: red fern).

The parameters observed in this research are moisture content, ash content, color formation speed, color intensity, phytochemical test, organoleptic test including hedonic scale test and quality, and glycemic response test. Data from organoleptic test which have been obtained then analyzed by variance and for organoleptic test data is converted from ordinal scale data into interval scale using MSI method (Method of Successive Interval)

Research procedure

The process of making red fern herbal in this research is as follows:

- **Sorting**

The materials used in this research are the leaves of red ferns and basil leaves obtained from Dayak Samarinda market, then sorting by way of uniformity of the material size to be used and the degree of aging of each ingredient. Then do the cleaning on the leaves of red ferns and basil leaves that is to remove the dirt-dirt, after it washed in running water.

- **Slicing**

Slicing is done using a knife tool as a cutter. In this slicing process is an advanced stage of the purge stage is done as a goal to reduce the size of red ferns and basil leaves so it will facilitate and accelerate in the process of drying process of the material.

- **Drying**

The drying process stage is done after the slicing process is done. The drying process step is intended to reduce the water content contained in the material. Drying of basil leaf and red fern is done by oven drying method with temperature around 55 ° C for 16 hours until the material is completely dry.

- **Mixing**

At this stage the dried material is then mixed in accordance with the prescribed treatment ratio.

Analysis

Test analysis performed include: 1) water content, 2) ash content, and 3) phytochemical analysis (AOAC, 2006), 4) Organoleptic test done by first brewing with comparison of red grass fern as much as 3 gram by using hot water 150 ml, The preferred scale on the red fern herbal beverage is assessed on a scale of 1-5 and hedonic quality on a scale of 1-7. 5) Color velocity analysis analysis: This analysis is done by entering as many as 3 grams of herbal bark into the glass after it was added boiling water as much as 150 mL. Then it is calculated manually using a stopwatch when water starts to be added in a glass until the color of the brew does not change anymore. 6) Color intensity analysis using UV spectrophotometer. Color intensity analysis using a UV spectrophotometer begins by using water (aquades) as a blank. The sample is the color of red fern herbal extract. Then the blanks are inserted into a UV spectrophotometer with a wavelength of 580 nm (Saragih, 2011). 7). Antioxidant activity by method DPPH (Molyneux, 2004). 8) Glycemic Response Test, a material for the glycemic response test of organoleptic test of red fern herbs with the best natural flavor or the most desirable and favored by panelists. Before the best red fern herbal samples were given to the subject, the objectives of the study were to be explained, then if they were willing to sign the informed consent. Blood sampling was done on the first day by giving 150 ml of red fern herbs (3 g) with 10 gram sugar concentration to 10 healthy volunteers who had undergone full fasting (except water) during the night (around 20.00 until 08.00 am the next day) Blood Collection was done by hose Time 30 minutes 4 times

(minutes to 0, 30, 60, and 90). Then 3 days after the first blood collection, then the second blood taking with the administration of 150 ml of sugar water with sugar concentration as much as 10 grams of control (Saragih, 2014a). Blood glucose measurement using the Accu Check Active Glucometer tool. Blood samples obtained on the surface of the skin after a small bit of injury by using a special lancet (puncture), are touched on the sensor gap at the end of the test strip that has been attached to the digital detector so that the sample glucose level is read.

III. RESULTS AND DISCUSSION

Phytochemical Red Ferns

The results of phytochemical analysis showed that the positive red fern tested contained alkaloids, hydroquinone phenols, flavonoids, saponins, and steroids (Table 1)

Table 1. Phytochemical content of red ferns

| | Phytochemicals | | | | |
|----------|----------------|---------------------|------------|----------|----------|
| | Alkaloids | Hydroquinone Phenol | Flavonoids | Saponins | Steroids |
| Red fern | + | + | + | + | + |

Description: + = positive

Water Content

Table 1. Water and ash content fern red herbal

| Treatment | Water content (%) | Ash content (%) |
|-----------|-------------------|-----------------|
| B0 | 13.67±0.81 | 0.93±0.02 |
| B1 | 13.72±0.33 | 0.94±0.01 |
| B2 | 13.87±1.32 | 0.94±0.02 |
| B3 | 14.06±1.32 | 0.95±0.01 |
| B4 | 14.59±1.89 | 0.95±0.02 |
| B5 | 16.37±4.88 | 0.95±0.01 |

Based on the results of variance, showed that the addition of basil leaves had no significant effect on the resulting red fern water content. The highest red herbal fern water content produced is about 13.67 ± 0.81% and the lowest is about 16.37 ± 4.88% (Table 1). Red fern herbs with the addition of basil leaves still have a high enough water content allegedly because the components of water in the fern herbal is a component of water that is physically bound so that

the water component inside the red fern is difficult to evaporate. Water content is one characteristic that plays an important role in the composition of food and also contribute to the stability of the quality of a product. The determination of moisture content is useful for expressing the content of the substances in plants as percent dry matter (Abraham *et al.*, 2014). The water content of a sample is closely related to the quality of the sample and the speed of the sample damage, whether microbiological or chemical.

Ash Content

Based on the results of variance, it is known that the addition of basil leaves have no significant effect on the content of red fern ash produced. The resulting content of red fern ash is in the range of 0.93 ± 0.01% to 0.95 ± 0.02% (Table 1). It proves that minerals contained a little and still meet the quality requirements set by the green herbal SNI 01-4453-1998 is a maximum of 8%. Research Anggraini *et al.* (2014) showed that the content of ash produced in herbaceous leaf raw material of pegagan was 13.22%, the result obtained was higher than the ash content produced by red fern herbs.

Color Formation Speed

The results of variance indicated that the velocity of the treatment time without treatment of stirring, or with stirring showed no significant effect on red fern herbs (Table 2). The highest result was control treatment (no addition of basil leaves) that was 5.94 minutes and the lowest result was on the addition of 5 grams of basil leaf that was 7.18 minutes. From the results obtained it is stated that red fern herbs without the addition of basil leaves are able to form a faster color than the addition of 5 grams of basil leaves with treatment without stirring. This is because the red fern has anthocyanin and beta carotene compounds.

Table 2. Time brewing the formation of color and colors intensity of red fern herbal

| Treatment | Color formation brewing time without stirring (Minutes) | Color formation brewing time with stirring (Seconds) | Color intensity (Absorbance value) |
|-----------|---|--|------------------------------------|
| B0 | 5.94±0.58 | 20.82±0.68 | 0.67±0.09 |
| B1 | 5.94±0.46 | 21.61±0.25 | 0.70±0.01 |
| B2 | 6.37±0.62 | 23.37±2.21 | 0.72±0.11 |
| B3 | 7.04±0.67 | 23.61±0.96 | 0.72±0.06 |

| | | | |
|----|-----------|------------|-----------|
| B4 | 7.15±0.38 | 24.71±1.61 | 0.76±0.07 |
| B5 | 7.18±0.75 | 24.85±4.37 | 0.80±0.05 |

The time of color formation with the highest agitation resulted from the control treatment was 20.82 seconds and the lowest value was obtained from the treatment of 5 grams of basil leaf that was 24.85 seconds. Stirring treatment plays a role in the rapid process of color formation resulting from the components of basil leaves and ferns will dissolve and break down the enzyme polifenol oxidase.

Color Intensity

The result of variance analysis showed that absorbance value in color intensity analysis by using UV spectrophotometer from each treatment had no significant effect on red fern herbs. The result of absorbance value on the intensity analysis of red fern herbal color is presented in table 2. The results showed that the red fern herb with the addition of basil leaves of 5 g had a higher absorbance value of about 0.80 nm and the red fern herb on the control treatment had a lower absorbance value of about 0.67 nm. It proves that the color produced red ferns and basil leaves have a strong brownish yellow color to absorb light. While the herbal fern red control does not produce a strong yellow absorption. Another study conducted by Saragih (2011) shows that the higher the concentration of the tiwai onion, the higher the intensity of the color.

Color Hedonic Scale and Hedonic Quality

The result of color hedonic scale and hedonic quality of red fern herbal is shown in Figure 1

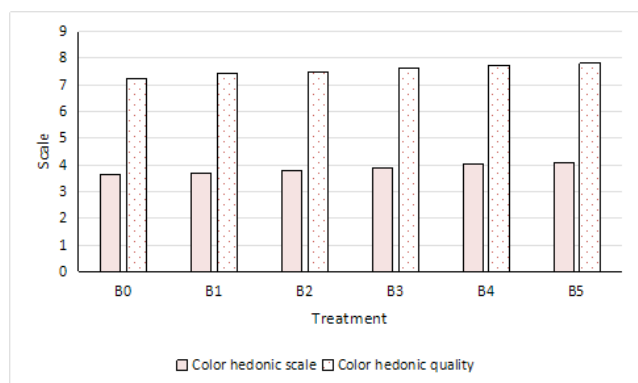


Figure 1. The color hedonic scale and hedonic quality of red fern herbal

Description :

Colors hedonic scale

1 : Very dislike , 2 : Dislike, 3 : Rather like , 4 : Like., 5 : Very like

Colors hedonic quality:

7: Red brown, 6: Rather brownish red, 5: Red gold, 4: Rather red gold, 3: Golden Yellow, 2: Rather yellow, 1: White

The results of variance, showed that the addition of basil leaves have no effect on the color hedonic and hedonic quality of red fern beverage produced. Hedonic color of the highest treatment on addition of 5 grams of basil leaves with a score of 4.09 ± 0.03 (like) and lowest on the control treatment with a score of 3.65 ± 0.12 (rather like). As for the highest hedonic quality of colors in the treatment of 5 grams of basil leaf with a score of 7.82 ± 0.38 (brownish red) and the lowest on the control treatment with a score of 7.24 ± 0.55 (brownish red). In the hedonic quality test panelists prefer the resulting color of red ferns red brownish ferns. Color is a physical parameter formed when light is about an object and is reflected about the sense of sight (eye).

Aroma Hedonic Scale and Hedonic Quality

The results of variance, showed that the addition of basil leaves had no significant effect on hedonic aroma and hedonic quality of red fern herbal aroma. The highest scores of hedonic aroma were obtained on 5 grams of basil leaf addition treatment (3.99 ± 0.14) and the lowest aroma hedonik score was 3.71 ± 0.16 (raher like). As for the highest scores of hedonic aroma quality, the addition of 5 grams of basil leaves is 6.16 ± 0.63 (very strong beroma basil) and for the lowest hedonic quality score is in the control of 5.55 ± 0.27 (aroma fern) as presented in Figure 2.

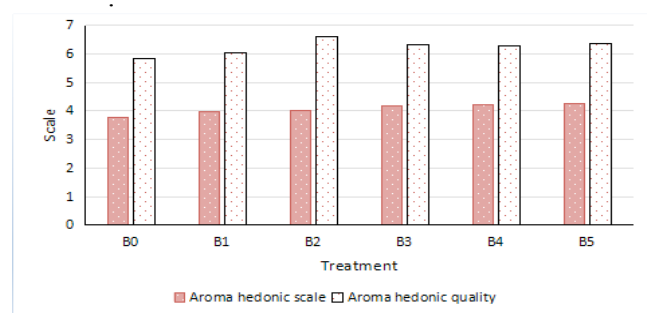


Figure 2. The aroma hedonic scale and aroma quality hedonic of herbal red fern

Description :

Aroma scale hedonic

1 : Very dislike , 2 : Dislike, 3 : Rather like , 4 : Like., 5 : Very like

Aroma hedonic quality:

7: Extremely strongly aroma basil, 6: Very strong aroma basil, 5: Aroma fern
4: Fairly aroma a fern, 3: Rather aroma a fern, 2: Aroma ferns, 1: Very aroma fern

Most of the panelists rather like the scent of basil leaves and red ferns that are less savory or langu. This is in accordance with Lee *et al.* (2013) that the unpleasant aroma of the leaves is in the form of aroma derived from the aliphatic aldehyde compound group of 3-methyl-butanal volatile compounds

Taste Hedonic Scale and Hedonic Quality

The results of variance showed that the addition of basil leaves had no significant effect on hedonic taste and hedonic quality of red fern herbal taste (Figure 3). The highest taste hedonic score was obtained in 5 grams of basil leaf addition treatment which was 4.26 ± 0.19 (slightly like) and the lowest was treated in the control treatment that was 3.76 ± 0.60 (rather like). Then for the highest taste hedonic quality score found in the treatment of 5 grams of basil leaf is 6.61 ± 0.23 (very sweet) and the lowest is in the control treatment is 5.83 ± 0.42 (sweet)

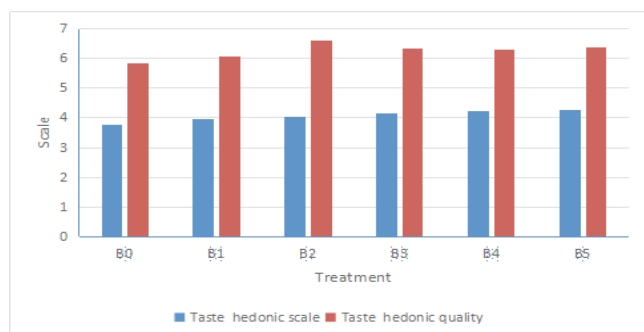


Figure 3. The taste hedonic scale and aroma quality hedonic of herbal red fern

Description :

Taste scale hedonic

1 : Very dislike ,2 : Dislike, 3 : Rather like , 4 : Like., 5 : Very like

Taste hedonic quality:

7: Extremely sweet, 6: Very sweet, 5: Sweet, 4: Rather sweet, 3: Not sweet, 2: Strongly not sweet, 1: Very strongly not Sweet

The best treatment was obtained at the addition of 5 g of basil leaves, and then used for antioxidant activity and glycemic response analysis.

Antioxidant Activity

The antioxidant activity of red fern extract is presented in Table 3. The percentage of DPPH inhibition increased with increasing concentration of red fern extract, at 500ppm inhibition 84.07% (Table 3). The EC50 value calculation is performed by interpolating the percentage of inhibition (50%) into the concentration test solution concentration curve with percentage of inhibition. From data of extract concentration of red fern with inhibition obtained by regression line equation $Y = 0,107X + 31,28$ with value of $EC = 174,95$. Based on the results of this study free antiradical DPPH herbal extract of red fern obtained effective concentration value (EC) 50 of 174.95 ppm. Herbal fern red potential as an antioxidant herbal drink

Table 3. Antioxidant activity of red fern herbal

| Concentration (ppm) | Absorbance | % Inhibition |
|---------------------|------------|--------------|
| 500 | 0,107 | 84,07 |
| 250 | 0,272 | 59,52 |
| 125 | 0,368 | 45,23 |
| 62,5 | 0,405 | 39,73 |
| 31,25 | 0,458 | 31,84 |

Glycemic Response

The result of comparison of blood glucose response after drinking herbal extract of red ferns plus 10 g sugar and 150 ml of water plus sugar 10 g of blood of respondents are presented in the following Table 4 and Figure 4. Based on the Multiple T-Test test that the red fern herbs and 10 g / 150 mL sugar water were not significantly different. Based on the results in Figure 4 the mean value of the blood glucose response of the subjects to red fern herbs with a sugar concentration of 10 g, 150 mL of water with a sugar concentration of 10 g had a different increase increment from each other.

Average fasting blood glucose volunteers 0 minutes before consuming red fern herbs with a sugar concentration of 10 g is 89.8 ± 10.3 mg / dL, then at minute 30 after drinking herbal fern red blood sugar volunteers have an increase of about $105,1 \pm 12.3$ mg / dL with a difference in blood sugar increase of 14.4 mg / dL. Furthermore, for the 90th minute after consuming the herbal fern red, volunteer blood sugar decreased to about 90.7 ± 8.4 mg / dL with a decrease

of about 5.9 mg / dL. In the 120th minute the blood sugar of the volunteers decreased and returned to fasting glucose which is about 84.8 ± 8.6 mg / dL with a difference of 20.3 mg / dL.

Table 4. Glucose response of red fern herbal and water add 10 sugar (mg/dL)

| Healthy volunteers | Red fern herbal water extract 150 ml add sugar 10 g | | | | Water 150 ml add sugar 10 g | | | |
|--------------------|--|-------|------|--------|--------------------------------|------|-----|----|
| | Minute | | | | Minute | | | |
| | 0 | 30 | 90 | 120 | 0 | 30 | 60 | 90 |
| Glucose (mg/dL) | | | | | | | | |
| 1 | 104 | 108 | 101 | 97 | 87 | 102 | 74 | 79 |
| 2 | 83 | 105 | 90 | 88 | 102 | 114 | 98 | 90 |
| 3 | 86 | 125 | 95 | 77 | 86 | 109 | 81 | 86 |
| 4 | 100 | 113 | 77 | 82 | 94 | 107 | 84 | 84 |
| 5 | 81 | 103 | 88 | 78 | 85 | 102 | 93 | 88 |
| 6 | 97 | 95 | 99 | 95 | 90 | 108 | 90 | 90 |
| 7 | 78 | 87 | 85 | 77 | 87 | 111 | 87 | 78 |
| Average | 89.8 | 105.1 | 90.7 | 84.8 | 90.1 | 107. | 86. | 85 |
| Standard WHO | | | | 72-126 | | 6 | 7 | .0 |

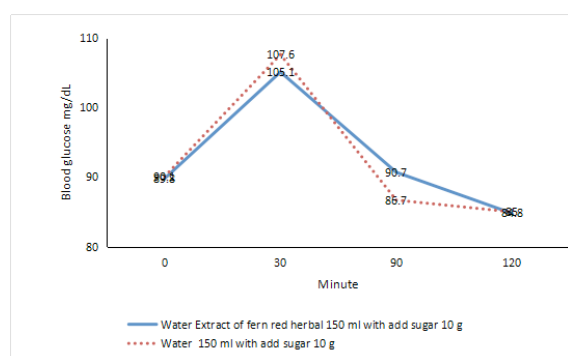


Figure 4. Glucose response of red fern herbal and water add 10 sugar (mg/dL)

The food glycemic index is influenced by several factors, such as the type of materials, processing and characteristics (composition and biochemical properties) of food. The same type of food, when processed in different ways, can have different glycemic indexes (Saragih *et al*, 2014^b; Saragih *et al*, 2017).

CONCLUSION

The addition of basil leaves to the red fern herbs has no significant effect on moisture content, ash content, color formation speed without stirring, color formation speed with stirring, color intensity,

organoleptic analysis including hedonic test and color hedonic quality, hedonic test and hedonic quality of aroma and test Hedonic and hedonic taste qualities. The best treatment was obtained at the addition of 5 g of basil leaves and used for glycemic response analysis. EC₅₀ red fern herbal drink is 174,95 ppm. The healthy volunteers who drank a 150 ml red herbal fern drink with the addition of 10 g sugar had a lower glycemic response compared with a control drinking only 150 ml of water with 10 g of sugar added.

ACKNOWLEDGMENTS

Thanks to the program of The Development of Four Universities as The Center of Excelent For Nation Competitiveness for funding this research

REFERENCES

- [1] Abraham., A, Fauziyah., B, Fasya., G.A, Adi., K.T. 2014. The antitoxoplasmic test of crude alkaloids extract of pulai leaf (*Astonia scholaris*, (L.), R. Br) against the mice (balm / c *Mus musculus*) infected with toxoplasma gondii strain rh. *ALCHEMY*. 3(1):67-75.
- [2] Anggraini., T, Silvy., D, Ismanto., D.S, Azhar., F. 2014. Effect of addition of peppermint (*Mentha piperita*, L.) to the quality of herbs of pegagan leaf (*Centella asiatica*, L. Urban). *Jurnal Litbang Industri*. 4(2):79-88.
- [3] AOAC, 2006. Association of Official Analytical Chemists. Official Method of Analysis (18th edition). AOAC Intl., USA.
- [4] Lee., J, D.H., Chambers, E., Chambers, K., Adhikari, and Y., Yoon. 2013. Volatile aroma compounds in various brewed green teas. *Molecules*. 18:10024-10041.
- [5] Molyneux, P 2004. The use of stable free radicals diphenylpicrilhydrazyl (DPPH) for estimating antioxidant activity. *Songklanakarin J.Sci.Technol.*, 26(2):211-219.
- [6] Saragih, B. 2011. Functional drinks herbal dye bawang tiwai (*Eleutherine americana*, Merr). *Jurnal Badan Penelitian dan Pengembangan Daerah Kutai Kartanegara* 5(1): 15-21.
- [7] Saragih, B, 2014a. Glycemic response of pumpkin cookies (*Cucurbita moschata* Durh.). *Jurnal Boga dan Gizi*. 8(1):11-15.
- [8] Saragih, B, M.Pasiakan, Saraheni, and D. Wahyudi, 2014b Effect of herbal drink plants tiwai (*Eleutherine americana* Merr) on lipid profile of hypercholesterolemia patients,

- International Food Research Journal 21(3):1163-1167
- [9] Saragih, B., Marwati, B. Saragih, H. Suprpto, and M. Rachmawati, 2013. Effect of various types of herbs on sensory properties and blood glucose response adan instant black rice. International Journal of Science and Engineering. 5 (1):42-48. doi 10.12777/ijse.5.1.42-48
- [10] Saragih, B., Maulida Rachmawati, Marwati dan Suhardi, 2017. Nutrition and blood glucose response of food formulated four types of local flour east kalimantan added plant extracts tiwai (*Eleutherina americana* Merr).
- [11] Journal of Environmental Science, Toxicology and Food Technology. 11 (2): 37-43. doi. 10.9790/2402-1102013743

The Effect of Citric Acid on Teak Leaves Anthocyanin Extraction Process (*Tectona grandis* L.) and The Teak Leaves Extract Proportion to The Physical and Chemical Syrup Characteristics

Devi Dwi Siskawardani, Silvia Khilmi, Irvan Ramadhana Putra, Ririn Agustin, and Selvy Triskiana Wista

University of Muhammadiyah Malang, Raya Tlogomas 246 Malang, Indonesia

Email : devi_dhanian@yahoo.com

ABSTRACT

Teak (*Tectona grandis* L.) is one of tropical native herbs from Indonesia, which tubers development has been focused and the leaves become wastes. Nowadays, the teak leaves compound has been investigated alike its phenolic compound for coloring agent, mosquito larvicidal, and organic fertilizer composite. This research aimed to analyze the effect of citric acid addition to the teak leaves extraction process and the impact of teak leaves extract proportion to the physical, chemical, and organoleptic syrup characteristics. This research consisted of 2 main steps. The first was citric acid addition (2%, 3%, 4%, 5% and 6%) on extraction process and the second was teak leaves extract addition on syrup production. The Completely Randomized Design (CRD) with 4 levels of factors (30%, 40%, 50%, and 60%) and 3 replications were applied to analyze the parameter. The citric acid addition gave very significant effect ($p > 0.01$) on pH, antioxidant, and color (L), while it gave not significant effect on color (a and b) and anthocyanin of teak leaves extract. The result showed that the effect of teak leaves extract addition was very significant ($p > 0.01$) on the pH, color (L and a), viscosity, and sugar content of syrup. While it was also significant ($p > 0.05$) on anthocyanin content and insignificant on color (b) of syrup. The best treatment was proved by 50% addition of teak leaves with the value of pH (3.86), viscosity (1.57), sugar content (23), color (L= 31.3; a=2.66; b=-0.4), anthocyanin (0.05), and antioxidant (0.728).

Keywords : teak leaves; anthocyanin; antioxidant; syrup

I. INTRODUCTION

The awareness of natural healthy is growing, and it was proved by the spices and herbs usage as natural medicine [1]. Teak leaf extract (*Tectona grandis* L.) contains natural pigment called anthocyanin, which produces maroon [2]. Teak leaf also consists antimicrobial such as flavonoids, alkaloids, tannins, anthraquinone and naphthoquinone that obstruct bacteria growth [3]. Altogether teak leaf is promoting for food coloring and food preservation [4].

Anthocyanin is well known as flavonoids [5]. Anthocyanin is polyphenols with known antioxidant activity and is generally accepted as the largest and most important group of water-soluble pigments [6]; [7]. Major sources of anthocyanin are blueberries, cherries, raspberries, strawberries, black currants, purple grapes and red wine [5].

The diversity of anthocyanin depends on the number and position of hydroxyl and methoxy groups on the basic skeleton; the identity, number and positions at which sugars are attached; and the extent of sugar acylation and the acylating agent identity [6]; [8]; [9]. Anthocyanin colour intensity is affected by hydroxyl and methoxyl groups numbers. If hydroxyl groups predominate the color goes more bluish, but if more methoxyl then redness is increased [10]; [11].

II. METHODS

First up to third teak leaves from top position at University of Muhammadiyah Malang field were collected for this study. This research was consisted on two main procedure, there were teak leaves extraction and followed by teak leaves extract addition on the syrup. Then teak leaves were extracted used citric acid

(2%, 3%, 4%, 5%, and 6%) and analyzed the anthocyanin (spectrophotometer absorbance = 511 nm and 700 nm), antioxidant (spectrophotometer), pH (pH-meter) and color (color-reader) of leaves extract [12].

Therefore the leaves extract were added to the syrup production (30%, 40%, 50%, and 60%). The anthocyanin, pH, color, sugar content (hand-refractometer), and viscosity (viscometer) of syrup were well documented [12]. 30 panelists recorded the organoleptic test of syrup at the end of experiment. The completely randomized design and 3 replications were adopted. Then the data were subjected to analysis of variance (ANOVA), LSD and De Garmo test.

III. RESULTS AND DISCUSSIONS

Citric acid is very soluble weak organic acid that used as an additive in several drinks. Commonly it used to improve the flavor, taste, antioxidant, and to maintain stability (preservative enhancement) [13]. The effect of citric acid addition on the decreasing teak extract pH was very significant ($p < 0.01$) (Figure 1.). This result in agreement with citric acid addition was able to reduce pH and as stabilizer of sweet potato [14]; [15].

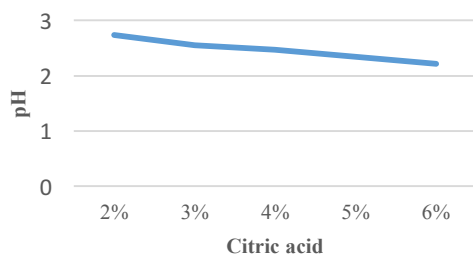


Figure 1. The effect of citric acid addition to the pH value of teak extract

Antioxidants able to prevent the initiation of browning by reacting with oxygen. Their effectiveness depends on pH, temperature, light, water activity and

composition of atmosphere [16]. The addition of citric acid was very significant on antioxidant activity (Figure 2.) ($p < 0.01$). This result was in agreement with the antioxidant activity of mushroom [17] and chestnut [18]. Many studies have revealed that the antioxidant activities of phenolic compound are probably due to their redox properties, which allow them to act as reducing agents, hydrogen donor and singlet oxygen quenchers [19].

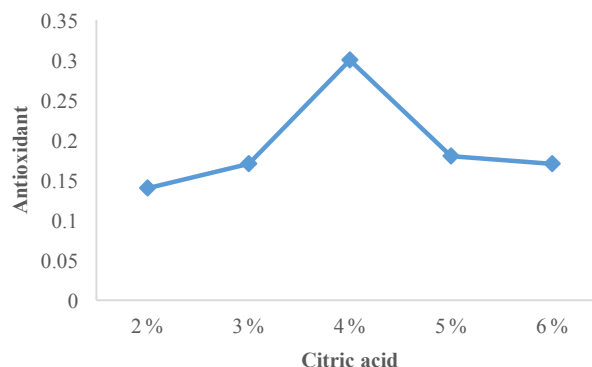


Figure 2. The effect of citric acid addition to the antioxidant of teak extract

The effect of citric acid addition was very significant difference to the color (L). While, it was not significant to the color (a) and (b) of teak extract (Figure 3.). The trend was similar with the experiment of sweet potato [15]. The experiment of frozen strawberry also showed the same trend [20]. It because the citric acid is antibrowning agent which prevent polyphenoloxidase by suppressing pH to form an inactive complex [21]. Commonly, several factors can affect the color alike pH, temperature, light, pigment presence, enzymes, sugar and enzymes [22]; [23].

The addition of citric acid on the anthocyanin of teak extract was not significant (Figure 4.). The stability of anthocyanin was influenced by polyphenoloxidase. Citric acid was used for the inhibitory activity on polyphenoloxidase and the antibrowning activity in minimally processed fruits and vegetables [20].

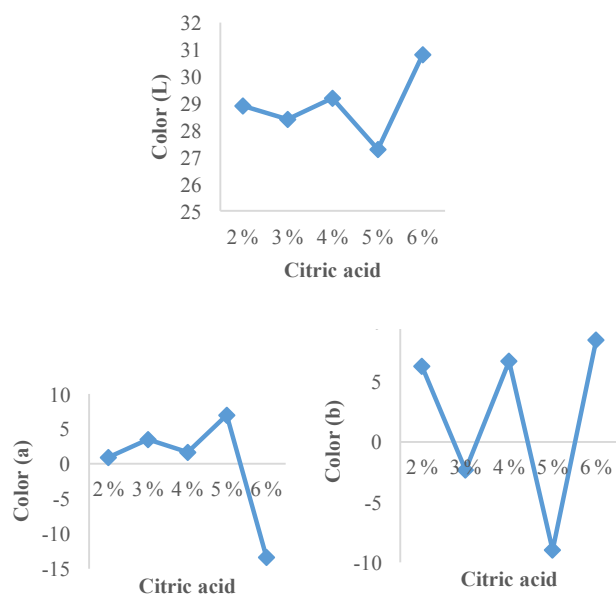


Figure 3. The effect of citric acid addition to Color (L, a, and b) of teak extract

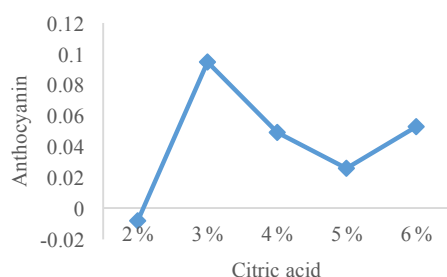


Figure 4. The effect of citric acid addition to the anthocyanin of teak extract

The result of second step was displayed on Table 1, Table 2, and Table 3. The second step analyzed the effect of leaves extract addition on syrup physical and chemical characteristics.

Table 1. Leaves Extract Addition Impacts on Syrup pH, Viscosity, and Sugar Content

| Treatment | pH | Viscosity | Sugar Content |
|-----------|--------|-----------|---------------|
| 30% | 3.95ab | 1.60a | 25.33a |
| 40% | 3.85a | 1.90b | 25a |
| 50% | 3.86a | 1.57a | 23a |
| 60% | 4.002b | 1.87a | 23.67a |
| F-Test | ** | ** | ** |
| CV (%) | 0.05 | 0.07 | 0.27 |

Remark: ** = Significant difference at $P < 0.01$.

The letters (a-b) in each column shows significant difference at $P < 0.01$

Table 1 showed the leaves extract addition impacts on syrup pH, viscosity and sugar contents were very significant difference ($p < 0.01$). The highest pH was shown by 60% leaves addition. Therefore, the highest viscosity was shown by 40% leaves addition and the highest sugar content was shown by 30% leaves addition.

Table 2 displayed the effect of leaves extract addition on the syrup color. The result showed that the effect of leaves extract addition on the color (L) and (a) were very significant ($p < 0.01$), while on the color (b) was insignificant. The larger value of color (L, a, b) means lighter, redder, and more yellow [24]. This results were lower with teak wood, the lightness (L) index ranged 42.86-68.31, the redness (a) 6-16.94 and yellowness (b) 16.84-33.32 [25].

Table 2. The Effect of Leaves Extract Addition on Syrup Color (L, a and b)

| Treatment | L | a | b |
|-----------|-------|-------|------|
| 30% | 29.5a | 3b | -1.3 |
| 40% | 29.3a | 2.63a | -0.8 |
| 50% | 31.3b | 2.66a | -0.4 |
| 60% | 30.1a | 2.67a | 0.3 |
| F-test | ** | ** | NS |
| CV (%) | 0.28 | 0.31 | |

Remark: ** = Significant difference at $P < 0.01$; NS = Not significant

The letters (a-b) in each column shows significant difference at $P < 0.01$

Table 3 described the effect of leaves extract addition on syrup anthocyanin was significant ($p < 0.05$) and insignificant on antioxidant. This result was in agreement with *Tectona grandis* contains natural pigment called anthocyanin that produces maroon color [2]. The Table 3 also shown the highest score of anthocyanin and antioxidant was in treatment 50%.

Table 3. Leaves Extract Addition Effect on Syrup Anthocyanin and Antioxidant

| Treatment | Anthocyanin | Antioxidant |
|-----------|-------------|-------------|
| 30% | -0.009a | 0.38 |
| 40% | -0.09a | 0.393 |
| 50% | 0.05c | 0.728 |
| 60% | -0.02b | 0.406 |
| F-test | * | NS |
| CV (%) | -3.18 | |

Remark: * = Significant difference at $P < 0.05$; NS = Not significant

The letters (a-b) in each column shows significant difference at $P < 0.01$

The organoleptic test result was shown on Table 4. The highest score for appearance was 3.35 (50%), aroma was 3.12 (50%), taste 3.64 (50%), and texture 3.35 (40%). The data described that the panelist mostly liked the treatment of 50% teak leaves addition on

syrup. Based on De Garmo test, the best treatment was shown by treatment 50% leaves extract addition.

Table 4. Leaves Extract Addition Effect on Syrup Organoleptic

| Treatment | Appearance | Aroma | Taste | Texture |
|-----------|------------|-------|-------|---------|
| 30% | 2.94 | 2.41 | 2.82 | 2.76 |
| 40% | 3.29 | 3.06 | 3.35 | 3.35 |
| 50% | 3.35 | 3.12 | 3.64 | 3.11 |
| 60% | 3.71 | 2.94 | 3.53 | 3.17 |

IV. CONCLUSION

The citric acid addition gave very significant effect ($p>0.01$) on pH, antioxidant, and color (L), while it gave not significant effect on color (a and b) and anthocyanin of teak leaves extract. While, the effect of teak leaves extract addition was very significant ($p>0.01$) on the pH, color (L and a), viscosity, and sugar content of syrup. While it was significant ($p>0.05$) on anthocyanin and was insignificant on color (b) of syrup. The best treatment was shown by 50% addition of teak leaves.

Acknowledgment

This research was financial supported by PKM program Ministry of Research Technology and Higher Education of The Republic of Indonesia (RISTEKDIKTI). Our great appreciation also to the Dean of Agriculture and Husbandry Faculty, advisory committee and lab mate on Technology for Agricultural Products Department, University of Muhammadiyah Malang who have assisted authors in preparing, observing, and writing this paper.

References

- [1] C. Setiawan, H. Purnomo, and J. Kusnadi, "Antioxidant extraction of teak (*Tectona grandis*) leaves using microwave-assisted extraction," *International Journal of Pharm.Tech. Research*, vol. 5 (3), pp. 1410-1415, 2013.
- [2] N.H. Ati, P. Rahayu, S. Notosoedarmo, and L. Limantara, "Composition and pigment substances natural dye of "Tenun Ikat" in Timor Tengah Selatan, Nusa Tenggara Timur," *Indonesian Journal of Chemistry*, vol. 6(3), pp. 325-331, 2006.
- [3] K.G. Purusthatham, P. Arun, J.J. Jayarani, R. Vasanthakumari, L. Sankar, and B.R. Reddy, "Synergistic in vitro antibacterial activity of *Tectona grandis* leaves with tetracycline,"

- International Journal of Pharm.Tech. Research*, vol. 2(1), pp. 519-523, 2010.
- [4] I.I. Arief, T. Suryati, D.N. Afyiah, and D.P. Wardhani, "Chemical and organoleptic of beef sausages with teak leaf extract (*Tectona grandis*) addition as preservative and Natural Dye," *International Food Research Journal*, vol. 21(5), pp. 2033-2042, 2014.
- [5] G.J. Mazza, "Anthocyanins and heart health," *Ann. Ist. Super. Sanità*, vol. 43, pp. 369-374, 2007.
- [6] M.G. Miguel, "Anthocyanins: antioxidant and/or anti-inflammatory activities," *Journal of Applied Pharmaceutical Science*, vol. 01(06), pp. 07-15, 2011.
- [7] J.B. Harborne, "Phenolic Compounds in Phytochemical Methods –a Guide to Modern Techniques of Plant Analysis," 3rd ed. New York: Chapman & Hall, 1998, pp. 66-74.
- [8] R.L. Prior, and X. Wu, "Anthocyanins: structural characteristics that result in unique metabolic patterns and biological activities," *Free Rad. Res.*, vol. 40, pp. 1014-1028, 2006.
- [9] I.B. Jaganath, and A. Crozier, "Dietary Flavonoids and Phenolic Compounds in Plant Phenolics and Human Health: Biochemistry, Nutrition, and Pharmacology," (edited by Cesar G. Fraga). New Jersey: John Wiley & Sons, Inc., Hoboken, 2010.
- [10] F.J. Heredia, E.M. Francia-Aricha J.C. Rivas-Gonzalo, I.M. Vicario, and C. Santos-Buelga, "Chromatic characterization of anthocyanins from red grapes. I. pH effect," *Food Chem.*, vol. 63, pp. 491-498, 1998.
- [11] F. Delgado-Vargas, and O. Paredes-López, "Anthocyanins and Betalains. In *Natural Colorants for Food and Nutraceutical Uses*," Boca Raton: CRC Press, 2003, pp. 167-219.
- [12] AOAC, "Official Methods of The Analysis of AOAC International 18th edition," USA: AOAC International. Maryland Ed., 2005.
- [13] E.I. Brima, and A.M. Abbas, "Determination of citric acid in soft drinks, juice drinks, and energy drinks using titration," *Chemical Journal ISSN* 2321-4902, vol.1(6), pp. 30-34, 2014.
- [14] D. Lester, "Consider Using Citric Acid. Maximum Yield," USA, 2011.
- [15] S.C. Sgroppo, L.E. Vergara, and M.D. Tenev, "Effects of the chemical treatment on fresh cut sweet potatoes," *Spain J.Agric Res.*, vol. 8(3), pp. 686-693, 2010.

- [16] I. Ioannou, and M. Ghoul, "Prevention of enzymatic browning in fruit and vegetables," *European Scientific Journal*, vol. 9(30), pp. 310-341, 2013.
- [17] A.J. Javan, A. Nikmanesh, K. Keykhosravy, S. Maftoon, M.A. Zare, M. Bayani, M. Parsaiemehr, and M. Raeisi, "Effect of citric acid dipping treatment on bioactive components and antioxidant properties of sliced button mushroom (*Agaricus bisporus*)," *J. Food Quality and Hazards Control*, vol. 2, pp. 20-25, 2015.
- [18] V. Uylaser, B. Incedayn, and G. Yildiz, "Effects of citric acid and Na-Metabisulphite on the shelf life of minimally processed *Haciomer* cv. Chestnut," *Inter. J. Applied Sci. and Tech.*, vol. 4(1), pp. 127-135, 2014.
- [19] S.T. Chang, J.H. Wu, S.Y. Wang, P.L. Kang, N.S. Yang, and L.F. Shyur, "Antioxidants activity of extracts from *Acacia confuse* bark and heart wood," *J. Agricultural and Food Chem.*, vol. 53, pp. 7274-7278, 2001.
- [20] M. Abd-Elhady, "Effect of citric acid, calcium lactate and low temperature prefreezing treatment on the quality of frozen strawberry," *Annals of Agri. Sci. J.*, vol. 59(1), pp. 69-75, 2014.
- [21] M. Martinez, and J.R. Whitaker, "The biochemistry and control of enzymatic browning," *Trends Food Sci. Technol.*, vol. 6 (6), pp. 195-200, 1995.
- [22] G. Mazza, and E. Miniati, "Anthocyanins in Fruits, Vegetables and Grains," London: CRC Press, 1993.
- [23] J.W. Rhim, "Kinetics of thermal degradation of anthocyanin pigment solutions driven from red flower cabbage," *Food Sci. Biotechnol*, vol. 11, pp. 361-364, 2002.
- [24] G. Wuszecki, and W.S. Stiles, "Colour Science: Concepts and Methods, Quantitative Data and Formulae, 2nd ed.," New York: Wiley, 1982.
- [25] N.S.A. Derkyi, H. Bailleres, G. Chaix, M.F. Thevenon, A.A. Oteng-Amoako, and S. Adu Brede, "Colour variation in teak (*Tectona grandis*) wood from plantations across the ecological zones of Ghana," *Ghana J. Forestry*, vol. 25, pp. 40-49, 2009.

Bio-briquettes Innovation Co-FES (Coconut Fiber and Egg Shell) as the Eco-Friendly Fuel with Pressure Giving Methods for Indonesian Energy Fuels Challenge

Erik Priyanto, Selvi Lutfiana Putri

Dept. Of Industrial Chemical Engineering
Sepuluh Nopember Institute of Technology
Surabaya, Indonesia

erikpriyantoxia2@gmail.com ; selvi.fhia@gmail.com

ABSTRACT

Problems about energy cannot be separated from human life. Therefore, alternative fuels are needed that cheap and eco-friendly for small industry and home industry. One of them is using alternative energy briquettes from biomass waste. So, the purpose of this research is to find ways of making Bio-briquette "Co-FES" from the mixture of coconut fiber and shell eggs, to determine the effect of pressure from pressing process with quality of Bio-briquette, and to determine the ratio of Bio-briquette experiments results with the Indonesian National Standardization (SNI) briquettes. There are three stages to make Bio-briquette from coconut fiber and egg shell. First step is pre-treatment stage, it is stage to prepare a raw material by drying and charring coconut fiber and eggshells. And the next stage by mixing all the raw materials of coconut fiber and egg shells plus a starch adhesive with a ratio of each of 3: 1 and 2: 1. Then, insert the material that has been mixed into the Bio-briquette mold with manual pressure, a pressure of 15 kg / cm², 30 kg / cm² and 45 kg / cm². The third stage is analysis stage includes the analysis of density, analysis of water content, ash content analysis, analysis of the mass loss and calorific value analysis. From the experiments it can be concluded that higher pressure, the density value is also higher. From variable density obtained optimum pressure is at a pressure of 45 kg/cm² on the material composition ratio of 2: 1 at 0.2654 g/cm³ according to SNI Bio-briquette No. 1/6235/2000 is ≤ 0.4507 g/cm³. The higher pressure, make water content are lower. In the variable pressure obtained the greatest water content is at manual pressure on the material composition ratio of 3: 1 equal to 5.8882% in accordance with SNI Bio-briquette No. 1/6235/2000 is $\leq 8\%$. The higher pressure make the ash content are lower. In the variable pressure obtained the most large ash content is at pressure of 45 kg/cm² on material composition ratio of 3: 1 at 5.3571% in accordance with SNI Bio-briquette No. 1/6235/2000 is $\leq 8\%$. The higher pressure, make the mass loss is lower. In the variable pressure obtained, the mass loss is greatest at a pressure of 15 kg/cm² on the material composition ratio of 3: 1 at 0.0055 g/s. The higher the pressure make calorific value is also higher. In variable calorific obtained pressure is greatest on manual pressure on the material composition ratio of 3: 1 amounted to 2,612,856.6 cal/g. From the analysis, it can be concluded that Bio-briquette from coconut fiber and shell eggs mixture with a composition ratio of 3: 1 and 2: 1 accordance with SNI Bio-briquette No. 1/6235/2000.

Keywords: bio-briquette, biomass, heat caloric

I. INTRODUCTION

Energy problems can not be separated from human life. Growing population, increasing human lifestyles and increasingly growing industries causing energy demand continues too, while availability of energy reserves is running low. So, it has an impact on the world fuel oil price increase, especially kerosene in Indonesia. Therefore, an alternative fuel is needed that is

cheap and eco-friendly as a kerosene substitute for small industries and home industry. One of these alternative energies is using briquettes from biomass waste [5]. Biological briquettes are clumps or charcoal sticks made from bioarang (soft material). Actually, bioarang is a soft material which is processed into hard charcoal with certain shapes.

Quality of this bioarang is not inferior to coal or other types of charcoal fuel. Briquettes are solid fuels that can be used as alternative energy sources that have a specific shape. Water content in the briquetting is between 10 - 20% from weight. Variation size of briquettes is from 20 - 100 grams. The selection of the briquetting process necessarily must refer to the segment market in order to achieve optimal economic, technical and environmental value [5]. Bio briquettes is often used to substitute oil fuels for small industries and large industries, the one of application bio briquette on industry that is used for boiler fuel.

II. EASE OF USE

C. Biomass

Biomass is an organic material produced by photosynthetic processes, both products and waste. Examples of biomass include plants, trees, grass, agricultural waste, forest waste, faeces and livestock manure. Besides of used for primary purposes such as fiber, foodstuff, animal feed, vegetable oil, building materials and so on, biomass is also used as a source of energy (fuel) but, it used economically low biomass fuel or a waste after the primary product is taken. Biomass is a material that can be produced from plants either directly or indirectly and utilized as energy or material in large quantities. Biomass is also called "Fitomassa" and often translated as bioresource or biological resources. Actually, Biomass can be used directly without going through charcoal first. However, the direct use of biomass is less efficient [2]. The main ingredients of biomass are a variety of chemicals (atoms) that mostly contain carbon atoms (C). Biomass is composed of cellulose and lignin (often called lignincelulose). The elementary composition of biomass is approximately 53% carbon, 6% hydrogen and 42% oxygen, and less nitrogen, phosphorus and sulfur (each typically less than 1%). Biomass can be processed into bio charcoal, which is a fuel with a high level of heat and it can be used in everyday [3].

D. Carbonization

Carbonization is a process to convert organic matter into charcoal. In the carbonization process will release combustible substances such as CO, CH₂, H₂, formaldehyde, methane, formic and acetyl acid as well as non-combustible substances such as CO₂, H₂O and liquid tar [3]. Charcoal is a black residue that containing impure carbon produced by removing the water content and volatile components from animal or plant. Charcoal is generally obtained by heating wood, bones,

and other objects. The charcoal, which is black, light, easy to break, and resembles coal consists of 85% to 98% carbon, and residual product is ash or other chemical elements [3]. Carbonization process occurs when there is an object heated up to its burning point so that object looks smoldering, then oxygen feed is stopped or limited by closing some of the holes so it does not burn to ash. Carbonization process was able to increase the calorific value and bounding carbon content and able to reduce water content, ash content, and levels of flying substances [3].

E. Bio-Briquette

A briquette is a solid produced by a compression process and when it burned produces little smoke. Making a Briquettes aims to obtain a quality fuel that can be used for all sectors as a replacement energy source (alternative). Briquettes are made from coal powder waste, coke, sawdust and wood charcoal with binders such as petroleum asphalt or coaltar [3]. Briquettes in cubic or cylindrical molds with varying sizes. By it way, then briquettes will have the characteristics: Strong enough to the handling, has a uniform shape and is resistant to air humidity. So, briquettes are only suitable for small and home industries. Calorific value of briquettes vary greatly according to the raw material [3]. Biological briquettes are clumps or charcoal sticks made of bio charcoal (soft material). Bio charcoal is actually a soft material which is processed into hard charcoal with certain shapes. The quality of bio charcoal is not inferior with coal or other types of charcoal fuel [5]. According to Setiawan (2012), factors affecting charcoal briquette characteristics are the specific gravity of the fuel or the density of the charcoal powder, the fineness of the powder, the temperature of carbonization, and the pressure of the forging. A good briquette requirement is a smooth surface briquettes and no black marks on hand. In addition, as fuel, briquettes must also fulfill the following criteria:

- a. Easy to turn on
- b. Without smoke
- c. Combustion emission gas do not contains toxic
- d. Waterproof and combustion products are not moldy when stored for a long time
- e. Shows the effort of combustion rate (time, combustion rate, and combustion temperature) is good.

According to [2], briquette briquettes have several advantages compared to conventional charcoal, there are:

1. Bio charcoal produces higher combustion heat.
2. It produces smoke less.

3. Has uniform shape and size as they are made with the printer.
4. Bio charcoal can appear more attractive because the shape and size can be customized by maker.
5. The manufacturing process uses raw materials that do not cause environmental problems.

F. Coconut Fiber

Coconut (*Cocos nucifera*) is a type of plant from *Areaceae* and is the member of the *Cocos* genus. This plant is used almost all its parts by humans so it is considered as a multipurpose plant, especially for coastal communities. Coconut is also the name for the fruit produced by this plant^[4]. Coconut fruit is the most valuable economic part. Coir, mesokarp parts of coarse fibers, traded as fuel, seat fillers, woven ropes, doormats, and growing media for orchids. Shells, which are actually endocarp parts, are used as fuel, buckets substitutes, beverage containers, and raw materials of various handicrafts^[4]. Coir (fiber) coconut or in Javanese commonly called sepet is a large part of coconut fruit, which is 35% from overall weight of the fruit. Coconut fiber consists of fiber and cork that connecting one fiber with other fibers. Fiber is a valuable part of the coir. Each coconut contains 525 grams of fiber (75% of coir), and 175 grams of cork (25% of coir). Coconut husk is usually used as a handicraft or as a planting medium, coconut husk is also used as wood fuel substitute by the villagers^[4]. But its use as a fuel, in addition to oil stove and gas stove. Besides, using coconut husk as fuel is still less practical if still in the form intact. Usually, from those who use coconut husk as a fuel is a brick making industry or other ceramic craft. Whereas, if coconut husk is converted into other forms to be more practical in its use as fuel, then this will be a very good potential, because coconut husk easy to find and the price is cheap. Another form of coconut husk to be more practical in its use as a fuel is to process it further as a briquette^[4].

G. Egg Shell

Egg shell is the most outer layer of eggs that serves to protect all parts of the egg. According to Utomo (2014), eggshells consist of 4 layers:

- a. Cuticle layer
The cuticle layer is a transparent protein that coats the eggshell surface. This layer coats the eggshell pores, but by its nature is still passable gas so that the release of water vapor and CO₂ gas can still occur.
- b. Layers of foam
This layer is the largest part from eggshell layer. This layer consists of protein and lime layer consisting of calcium carbonate, calcium

phosphate, magnesium carbonate and magnesium phosphate.

- c. Mamillary layer
This layer is the third layer of eggshell composed from conical layer with a round or oval cross section. This layer is very thin and consists of woven proteins and minerals.
- d. The membrane layer
Is part of the deepest eggshell layer. It consists of two layers of membrane covering that entire egg. The thickness is approximately 65 microns.

According to Utomo (2014), eggshell contains almost 95.1% consisting of organic salt, 3.3% organic matter (mainly protein), and 1.6% water. The most of organic material consists of Calcium carbonate (CaCO₃) compounds about 98.5% and Magnesium carbonate (MgCO₃) compounds about 0.85%. The minerals amount in the eggshell weights is 2.25 grams which consists of 2.21 grams of calcium, 0.02 grams of magnesium, 0.02 grams of phosphorus and a little iron and sulfur. At this time, People think that egg shells are just garbage that can not be utilized and thrown away, people do not realize that egg shells contain calcium with a high percentage that can be used as a source of calcium^[6].

III. EXPERIMENTAL WORK

A. Experiment Variable

Variables that used in this research are:

1. Fixed variable : Charcoal particle size using 120 mesh sieve, starch adhesive Percentage is 48% from the total weight of raw material.
2. Changes Variable : Comparison of coconut and egg shell varieties: 3: 1 and 2: 1, Pressure-pressing variables: manual, 15, 30 and 45 kg / m²

B. Materials Experiment

1. Water 2. Coconut husk 3. Leather Egg 4. Glue adhesive

C. Tools used

1. Beaker Glass 2. Porcelain Grille 3. Desiccator 4. Furnace 5. Glass Measure 6. Electric Stove 7. Oven 8. Hydraulic Pump 9. Screener 10. Spatula 11. Thermometer 12. Electric Scales

D. Experimental Procedure

1. Pre-Treatment

Coconut fibers Pre-treatment: Dry the coconut husk. Fabricated coconut husk that has dried. Mashing

the finished charcoal. Filter the coated coconut husk with 120 mesh strainer.

Eggshells Pre-treatment: Dry egg shells. Make a charcoal from dry egg shell. Mashing the finished charcoal. Filter the eggshell that has been pounded with a 120 mesh strainer.

Stage of adhesive starch: Weighing starch 3 grams. Adding water 53.4 ml and heated to be adhesive.

2. Stage of Experiment

Mix all raw materials (coconut charcoal + shell charcoal + starch adhesive). Considering the raw materials that have been mixed as much as 10 grams. Print the briquettes in the mold with the specified pressure variable and let it stand for 3 minutes. Insert briquettes into the oven with 110°C temperature. Repeats the same thing for different variables.

3. Analysis Stage

Moisture content analysis: Takes a bio briquette that be used for water content analysis. Insert in to oven with 110° C temperature for 1 hour. Insert sample into the desiccator. Weight it up to constant. Calculate the water content by using this formula:

$$\text{Water Content} = \frac{\text{Initial weight-Final Weight}}{\text{Initial weight}} \times 100\%$$

Ash analysis: Takes a bio briquettes that be used for ash content analysis. Insert sample into the furnace with a 600°C temperature of for 4 hours. Insert the sample into the desiccator. Weight it up to constant. Calculate the ash content by using the formula:

$$\text{Ash content} = \frac{\text{Initial weight-furnacing weight}}{\text{Initial weight}} \times 100\%$$

Density analysis: Determining the bio-briquette volume of tube volume calculation with r (radius) and h (height) is known by the formula $V = \pi r^2 h$. Determine the density, which is the ratio between the mass of biobriket and the volume of briquette (V) by the formula:

$$\rho = \frac{\text{bio briquette mass}}{\text{bio briquette Volume}}$$

Heating value (HV) and combustion (LP) analysis: Insert 50 ml of water into Erlenmeyer. Measure the initial temperature of water. Picked up 1 bio-briquette

to be used to calculate HV and LP. Burn the briquette and wait until the fire go out and the coals arise. Heat the water in an erlenmeyer. Calculates the time that bio-briquette takes become ash. Measures the final temperature of the water when the bio briquette has become completely ash. Weight the ashes of the bio-briquette that has been obeyed. Calculate HV and LP with this formula:

$$HV = m_{\text{water}} \times C_{p\text{water}} \times \Delta T_{\text{water}}$$

$$LP = \frac{\text{Initial mass} - \text{final mass (gr)}}{\text{time (second)}}$$

IV. RESULT AND DISCUSSION

C. Result

Table IV.1 Analysis Result of Biobriquette Density

| Ratio Material Biobriquette | Pressure Variable (kg/cm ²) | Initial Mass (gr) | Final Mass (gr) | Dimention | | | Biobriquette Density (gr/cm ³) |
|-----------------------------|---|-------------------|-----------------|-----------|--------|---------------------------|--|
| | | | | T (cm) | D (cm) | Volume (cm ³) | |
| 3:1 | Manual | 7,8 | 6,2 | 0,6 | 3,7 | 6,44799 | 0,248139343 |
| | 15 | 7,7 | 6,7 | 0,6 | 4 | 7,536 | 0,132696391 |
| | 30 | 6,9 | 6,1 | 0,4 | 4 | 5,024 | 0,159235669 |
| | 45 | 6,5 | 5,8 | 0,3 | 4 | 3,768 | 0,185774947 |
| 2:1 | Manual | 7,5 | 4 | 1,4 | 3,7 | 15,04531 | 0,232630634 |
| | 15 | 6,9 | 5,8 | 0,4 | 4 | 5,024 | 0,218949045 |
| | 30 | 5,5 | 4,8 | 0,4 | 4 | 5,024 | 0,238853503 |
| | 45 | 6 | 5,5 | 0,3 | 4 | 3,768 | 0,265392781 |

Table IV.2 Analysis Result of Water Content Biobriquette

| Ratio Material Biobriquette | Pressure Variable (kg/cm ²) | Initial Mass (gr) | Final Mass (gr) | Water Content Biobriquette (%) |
|-----------------------------|---|-------------------|-----------------|--------------------------------|
| 3:1 | Manual | 7,8 | 6,2 | 5,88823529 |
| | 15 | 7,7 | 6,7 | 4,47761194 |
| | 30 | 6,9 | 6,1 | 3,94736842 |
| | 45 | 6,5 | 5,8 | 2,81690141 |
| 2:1 | Manual | 7,5 | 4 | 4,28571428 |
| | 15 | 6,9 | 5,8 | 5,79710145 |
| | 30 | 5,5 | 4,8 | 4 |
| | 45 | 6 | 5,5 | 3,33333333 |

Table IV.3 Analysis Result of Dust Content Biobriquette

| Ratio Material Biobriquette | Pressure Variable (kg/cm ²) | Weight of Empty Cawan (gr) | Weight of Cawan + content after burned (gr) | Weight of Dust (gr) | Dust Content (%) |
|-----------------------------|---|----------------------------|---|---------------------|------------------|
| 3:1 | Manual | 20,6 | 20,9 | 0,3 | 4,477612 |
| | 15 | 39,1 | 39,3 | 0,2 | 2,941176 |
| | 30 | 44,7 | 44,9 | 0,2 | 3,389831 |
| | 45 | 20,2 | 20,5 | 0,3 | 5,357143 |
| 2:1 | Manual | 25,8 | 26 0,2 | 0,2 | 3,225806 |
| | 15 | 20,6 | 20,7 | 0,1 | 1,785714 |
| | 30 | 29,6 | 29,8 | 0,2 | 2,857143 |
| | 45 | 48,1 | 48,3 | 0,2 | 4,444444 |

| Ratio Material Biobriquette | Pressure Variable (kg/cm ²) | Δ T (°C) | Residual Water Mass (kg) | Water Vapor Mass (kg) | Qalor Value of Water (kJ) | Briquette Mass (kg) | Qalor Value of Briquette (cal/gr) |
|-----------------------------|---|----------|--------------------------|-----------------------|---------------------------|---------------------|-----------------------------------|
| 3:1 | Manual | 41 | 0,04 | 0,01 | 85416,1 | 0,0078 | 2612856,6 |
| | 15 | 38 | 0,042 | 0,008 | 79167,3 | 0,0088 | 2146512 |
| | 30 | 34 | 0,0432 | 0,0068 | 70835,1 | 0,0082 | 2061129,2 |
| | 45 | 23 | 0,0455 | 0,0045 | 47921,5 | 0,008 | 1429259,9 |
| 2:1 | Manual | 38 | 0,0413 | 0,0087 | 79167,1 | 0,008 | 2361158,5 |
| | 15 | 27 | 0,0459 | 0,0041 | 56254 | 0,0059 | 2274951 |
| | 30 | 23 | 0,0462 | 0,0038 | 47921,7 | 0,0065 | 1759094,8 |
| | 45 | 23 | 0,0467 | 0,0033 | 47921,8 | 0,007 | 1633449 |

Table IV.4 Analysis Result of Mass Loss Rate

| Ratio Material Biobriquette | Pressure Variable (kg/cm ²) | Weight of Empty Cawan (gr) | Weight of Cawan + content after burned (gr) | Time of burned (s) | loss of rate mass (gr/s) |
|-----------------------------|---|----------------------------|---|--------------------|--------------------------|
| 3:1 | Manual | 55 | 50,1 | 1888 | 0,002595339 |
| | 15 | 37,9 | 28,3 | 1745 | 0,005501433 |
| | 30 | 54,9 | 51,2 | 1705 | 0,002170088 |
| | 45 | 52,1 | 49,1 | 1687 | 0,001778305 |
| 2:1 | Manual | 34,6 | 32,2 | 1840 | 0,001304348 |
| | 15 | 37,2 | 28,8 | 1750 | 0,0048 |
| | 30 | 55,2 | 50 | 1600 | 0,00325 |
| | 45 | 54,2 | 53 | 1675 | 0,000716418 |

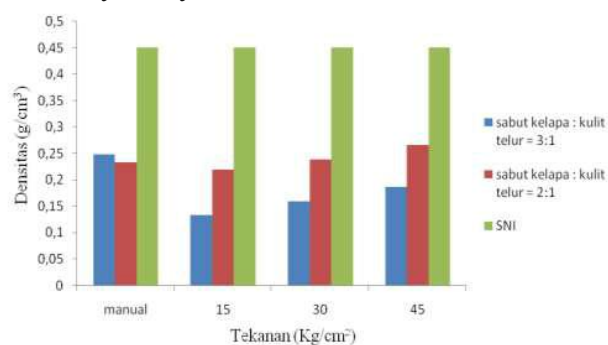
Table IV.5 Analysis Result of Biobriquette Qalor for Water Mass 0,05 kg

D. Discussion

The purpose of this bio briquette experiment is the way of making bio briquettes from coconut fiber and eggshell as alternative fuels that being standards, knowing the exact composition size in the batch-making mixture that meets the standards and knows what needs to be analyzed and know how to analyze the product

On the Bio briquette production comparison from coconut husk and egg shell biobriket analysis of water content, ash content, density, rate and mass of heat on each variable bio briquette made.

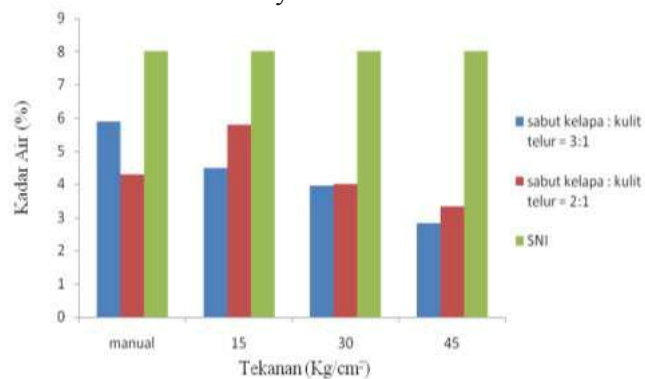
a. Density Analysis



From Chart IV.1 showed, relationship between pressure (Kg / cm²) and density (g / cm³) of briquette with composition ratio between coco fiber and egg shell of 3:1 yield at manual pressure has a density of

0.248 gr/cm³; briquette with 15 Kg/cm² pressure has a density of 0.132 gr/cm³; briquette with 30 Kg/cm² pressure has a density of 0.1592 gr/cm³; briquette with 45 Kg/cm² pressure has a density value of 0.185 gr/cm³. ratio of the composition between coconut husk and eggshell is 2:1 yield at manual pressure has a density of 0.2326 gr/cm³; briquette with 15 Kg/cm² pressure has a density of 0.2189 gr/cm³; briquette with 30 Kg/cm² pressure has a density of 0.2388 gr/cm³; briquette with 45 Kg/cm² pressure has a density of 0.2654 gr/cm³. Results of this experiment can be concluded that briquette density for all pressures in accordance with SNI No. Biobriket. 1/6235/2000 is ≤ 0.4507 g/cm³. From the graph also obtained that the largest density at pressure 45 Kg/cm² with composition ratio between coconut husk and egg shell is 2: 1, 0,2654 gr /cm³. From the graph it can be obtained that high pressure then also high density. This is accordance with the literature which that the higher pressure, it make the briquette volume are lower. When the volume is low, then the density is high. So, the higher the pressure,make the higher density.

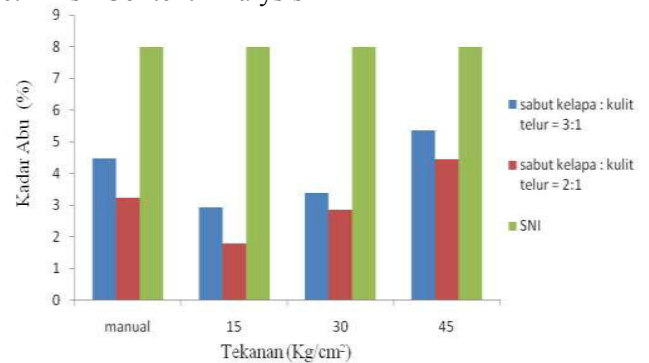
b. Water content analysis



From Chart IV.2 showed relationship between pressure (Kg/cm²) and water content (%)briquette with ratio composition between coconut husk and shell is 3:1 yield at manual pressure has moisture content of 5.8882%; In briquette with a 15 Kg/cm² pressure has a moisture content of 4.4776%, on a 30 Kg/cm² pressure briquette having water content of 3.9473%, on a 45 Kg/cm² pressure briquette having water content of 2.8169%. While comparison of the composition between coconut husk and egg shell is 2:1 results at manual pressure has a water content of 4.2857%, briquette with 15 Kg/cm² pressure has a water content of 5.7971%, on the briquette with 30 Kg/Cm² pressure has a water content of 4%, on the briquette with 45 Kg/cm² pressure has a water content of 3.333%. The results of this experiment can be summarized that the applicable water requirements

for all pressures in accordance with ISO / 1/6235/2000 is $\leq 8\%$. Bio briquette air content is expected to be as low as possible so that the caloric high and easy to burn. The experimental results showed the highest water content at manual pressure on the composition of the material 3: 1 is 5,8882%. This is in accordance with the literature that is certain high pressure given the more water that wasted so that eventually the water content of the briquettes will be lower [1].

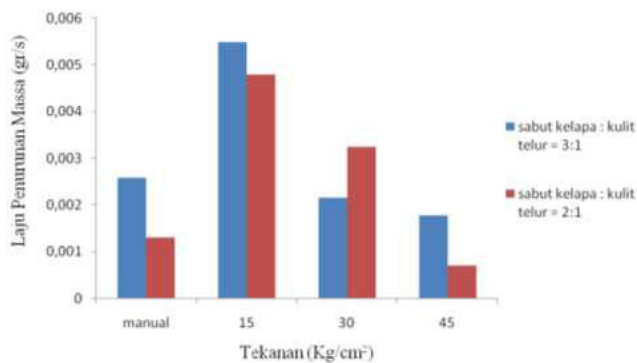
c. Ash Content Analysis



From Chart IV.3 showed relation between pressure (Kg /cm²) and ash content (%)briquette with ratio composition between coconut husk and egg shell of 3: 1 obtained result at manual pressure having water content 4,4776%; briquette with 15 Kg/cm² pressure has water content of 2,9412%, at 30 Kg/cm² pressure briquette having water content 3,3898%, at 45 Kg/cm² pressure has moisture content of 5.3571%. While comparison of the composition between coconut husk and egg shell of 2: 1 obtained results at manual pressure has a water content of 3.2257%, on biobriket with 15 Kg/cm² pressure of has a moisture content of 1.7857%, on the briquette with 30 Kg/cm² pressure has a water content of 2.8571%, on the briquette pressure 45 Kg / cm² has a water content of 4.4444%. The results of such experiments can be concluded that the briquette ash content value for all the pressures in accordance with SNI Biobriket No. 1/6235/2000 is $\leq 8\%$. The experimental results showed that the highest ash content at 45 Kg/cm² pressure on the composition of the 3: 1 composition was 5.3571%. From that graph obtained that ash content in the composition ratio of 3: 1 more than 2: 1 because of the composition of coconut fiber in a ratio of 3: 1 more, so ash content is generated more and from the graph obtained that the higher pressure make ash content increasingly high. This is not accordance with the literature which states that the higher pressure will be given briquette ash content lower, because at the time of forging some adhesives, the ash will come out, so that eventually of briquette will be lower [1]. This incompatibility caused

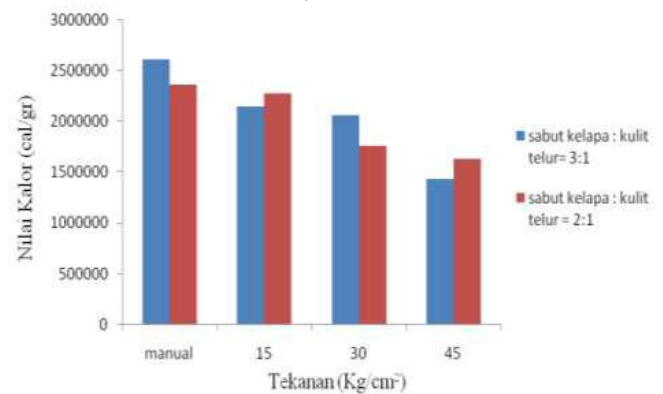
by several factors such as lack of pressure when the pressing process is still a lot of water content in the briquette so that Resulting in ash content not in accordance with the literature.

d. Mass Loss Rate Analysis



From Chart IV.4 showed the relation between pressure (Kg/cm²) and mass loss rate (gr/s) of briquette with composition ratio between coconut fiber and egg shell of 3: 1 obtained result at manual pressure of mass decrease rate 0,0026 gr/s, on a briquette with 15 Kg/cm² pressure having mass loss rate of 0.0055 gr/s, at 30 kg/cm² pressure briquette having mass loss rate of 0.0022 g/s, at 45 Kg/cm² pressure briquette having having mass loss rate Of 0.0017 gr/s. While the comparison of the composition between coconut fiber and egg shell of 2: 1 obtained results at manual pressure of mass decrease rate of 0.0013 gr/s, on briquette with 15 Kg/cm² pressure having mass loss rate of 0.0048 gr/s, at Briquette with 30 Kg/cm² pressure having mass loss rate of 0.0032 gr/s, at the briquette with 45 Kg/cm² pressure having mass loss rate of 0.0007 gr/s. The results of such experiments showed that the mass loss rate at the pressure 15 Kg / cm² in the 3: 1 material composition ratio is 0.0055 g / s. From the chart shows that the higher pressure so it make lower the mass decrease. This is accordance with the literature which states that the greater pressure, make smaller the burning rate. It Cause the briquettes that have high pressure result in less briquette space so that oxygen can not enter and slow down the combustion process. This incompatibility caused by several factors such as lack of pressure when the pressing process is still a lot of water content in the briquettes, resulting in the calorific value is not in accordance with the literature.

e. Calorific Value Analysis



From chart IV.5 showed relationship between pressure (Kg/cm²) and calorific value (cal/gr) briquette with composition ratio between coconut fiber and egg shell of 3: 1 obtained result at manual pressure of calorific value 2612856,6 cal/gr, On briquette with 15 Kg/cm² pressure, having calorific value of 2146512 cal/gr, at 30 kg/cm² briquette pressure value having calorific value of 2061129.2cal/gr, at 45 Kg/cm² pressure briquette having calorific value of 1429259.9 cal/gr. While the comparison of composition between coconut fiber and egg shell is 2:1 obtained the result at manual pressure of calorific value of 2361158,5 cal/gr, on briquette with 15 Kg/cm² pressure, having caloric value 2274951 cal/gr, at 30 kg/cm² pressure, having calorific value 1759094,8 cal/gr, on briquette with 45 Kg/cm² pressure having calorific value of 1633449 cal / gr. From the result of this experiment can be concluded that the calorific value of briquette for all pressures in accordance with SNI Biobriket No. 1/6235/2000 ie> 5000 cal / gr. The result of experiment showed that the highest heating value was at manual pressure on the composition of 3:1 composition is 2612856,6 cal / gr. From the chart is found that the higher pressure it make lower heating value. This is not in accordance with the literature which states that the higher the pressure given the higher the calorific value of briquettes, this is because at the time of forging some of the water and the binder will be wasted out, causing higher briquette calorific value ^[1]. This incompatibility caused by several factors such as lack of pressure when the pressing process is still a lot of water content in the briquettes, resulting in ash content is not in accordance with the literature.

CONCLUSION

From this experiment to making bio briquette from coconut fiber and egg shell charcoal can be obtained conclusion that is:

1. The higher pressure making density value is also higher. In variable Manual pressure, 15 kg /cm²; 30 kg/cm² and 45 kg/cm² obtained the optimum density value at pressure 45 kg / cm² in ratio composition 2:1 of 0.2654 gr / cm³ in accordance with SNI Biobriket No. 1/6235/2000 is ≤ 0.4507 g / cm³.
2. The higher pressure making water content is also lower. In variable Manual pressure, 15 kg/cm²; 30 kg/cm² and 45 kg/cm² obtained the highest value of water content at the manual pressure on the composition of the material 3: 1 composition of 5.8882% in accordance with the SNI No. Biobriket. 1/6235/2000 is $\leq 8\%$.
3. The higher pressure making ash content is also lower. In variable Manual pressure, 15 kg/cm²; 30 kg/cm² and 45 kg/cm² obtained the greatest value of ash content at the 45 kg/cm² pressure in the ratio of 3: 1 material composition 5.3571% in accordance with SNI No. Biobriket. 1/6235/2000 is $\leq 8\%$.
4. The higher pressure making mass loss is also lower. In variable Manual pressure, 15 kg/cm²; 30 kg/cm² and 45 kg/cm² obtained the greatest value of mass loss rate at the 15 kg/cm² pressure in the ratio material composition of 3:1 is 0.0055 gr/s.
5. The higher pressure making calorific value is also higher. In variable pressure Manual, 15 kg/cm²; 30 kg/cm² and 45 kg/cm² obtained the largest calorific value at manual pressure on the material composition ratio of 3: 1 is 2612856,6 cal / g.
6. From the analysis results can be concluded that the bio briquette of coconut and egg shell mixture with ratio of 3: 1 and 2:1 composition fulfill the SNI Biobriket No. 1/6235/2000.
7. From the analysis result of density value, water content and mass loss rate according to literature while for analysis of ash content and calorific value not yet in accordance with literature.

References

- [1] D. Cory and Yase Defirsa, "Pengaruh Kadar Perekat dan Tekanan Kempa Terhadap Sifat Fisis dan Kimia Briket Arang dari Serasah Daun Acacia mangium Wild", IPB, Bogor, 2001.
- [2] E. Elfiano, P. Subekti and A. Sadil , "Analisa Proksimat dan Nilai Kalor pada Briket Bioarang Limbah Ampas Tebu dan Arang Kayu", Briquette Journal , 2014, pp 57-64.
- [3] I.B.G. Gianyar, Nurcahyati and Y. A. Padang, "Pengaruh Persentase Arang Tempurung Kemiri Terhadap Nilai Kalor Briket Campuran Biomassa Ampas Kelapa - Arang Tempurung Kemiri", Mechanical Engineering Journal, 2012, pp 67-74.
- [4] S. Ningtyastuti, T.H. Santi and Y.E. Saputri, "Briket Sabut Kelapa Sebagai Alternatif Bahan Bakar". Unpublished
- [5] A. Setiawan, O. Andrio and P. Coniwanti, "Pengaruh Komposisi Pembuatan Biobriket dari Campuran Kulit Kacang dan Serbuk Gergaji Terhadap Nilai Pembakaran", Jurnal Teknik Kimia , 2012, pp 9-16.
- [6] A.W Utomo, "Pemanfaatan Kulit Telur Ayam, Bebek Dan Burung Puyuh Pada Proses Pembekuan Darah", UNNESS, Semarang, 2014

Combustion and performance of DI diesel engines using biodiesel of kemiri sunan (*Reutealis Trisperma Airy Shaw*) as a alternative fuels

¹G. Hamdana Putra, ²F. A. Setio Budi, ³A. Z. Muhammad Fathallah

¹Postgraduate Marine Engineering Dept. Institut Teknologi Sepuluh Nopember Surabaya, East Java, Indonesia

²Bachelor of Marine Engineering Dept. Institut Teknologi Sepuluh Nopember Surabaya, East Java, Indonesia

³Marine Engineering Dept. Institut Teknologi Sepuluh Nopember Surabaya, East Java, Indonesia

¹putragusmahamdana@yahoo.com

²fikisetiobudi@gmail.com

³fathalaz@gmail.com

ABSTRACT

Petroleum reserves as a fuel energy source in Indonesia are expected to be exhausted in 23 years if there is no alternative of fuels. Along with the government's program of energy security, it encourages researchers to look for potential alternative fuels sources instead of fossil fuels. One of the renewable energy that is currently heavily studied is biodiesel. In this paper describes one of the biodiesel that is kemiri sunan (*Reutealis Trisperma Airy Shaw*). Kemiri sunan is a conservation plant that grows in the ecosystem argo area with high oil content. Kemiri sunan biodiesel test was conducted to find out the combustion result and its performance. The tests were conducted on direct injection diesel engines with mixed fuel compositions between biodiesel and diesel fuel produced by Pertamina (B15 and B20). Then kemiri sunan biodiesel test results will be compared with diesel fuel produced by Pertamina itself. Parameters taken include pressure, heat release, ignition delay, power, torque, break mean effective pressure, specific of fuel consumption, and thermal efficiency. *The results show that kemiri sunan biodiesel has potential as a alternative fuels.*

Keywords: Kemiri Sunan Biodiesel; Combustion, Performance

I. INTRODUCTION

A. Biodiesel Overview

Diesel engines, fuels and renewable energy are topics that prioritized by many parties, especially researchers. This is to provide recommendations to government about renewable diesel engine technology. With the characteristics of efficiency, durability and high reliability, making diesel engines can be applied in various fields [1]. However, the fuel of this diesel engine still comes from a conventional source (fossil). Many countries experiencing the problem of shortage of fuel sources are no exception Indonesia. Whereas the country's need for fuel is enormous. Non-renewable fuels are very limited in existence and over time will decrease their source capacity [2].

Biodiesel is one of energy sources that being studied and developed. Using biodiesel as fuel is one of the efforts from researchers and Indonesian government to reduce dependence by using fossil sources. This source is composed of mono alkyl esters of fatty acids derived from renewable vegetable oils or animal fats. Essentially vegetable oils and animal fats are long-chain saturated chain triglycerides and unsaturated fatty acids.

Theoretically, the composition of vegetable oils or animal fats can be directly applied to diesel engines, but from direct use will cause some problems such as pumping, gumming, atomization, injector fouling, carbon deposit until component acceleration becomes worn out [3]. Therefore there is a standard that regulates biodiesel fuel, which aims to set a minimum limit of the fuel characteristics of vegetable oils or animal fats can be used in diesel engines. This standards have been established and developed in various around the world such as American Society for Testing and Materials (ASTM) International as fuel that meeting the requirements of ASTM, European Standard (EN) [2], International Organization for Standardization (ISO) [3], Brazil, South Africa, Australia and elsewhere.

Biodiesel is a lot of attention to researchers because it has advantages and benefits. One of the advantages of properties such as cetane number, flash point, sulfur content, non-toxic and of course the resulting gas emissions not far from diesel fuel. In addition, biodiesel is also capable of being mixed with diesel fuel in different ratio compositions without requiring modifications to the engine in testing [4]. Other advantages can be reviewed environmental aspects. Using biodiesel gives consequences about emissions

from gas produced. The gas emissions consist of Hydrocarbons (HC), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Carbon Dioxide (CO₂) and Particulate Matter (PM). Where gas emissions could affect air pollution, especially the ozone layer and affect human health [5]. Some researches have concluded that the use of biodiesel is able to reduce gas emissions from those produced by diesel fuel, such as HC, CO, and PM. However, the NO content produced by biodiesel fuel is greater than that of diesel fuel. This of course will also

have an impact on the environment of human health, acid rain to the acidity of water sources [6].

There have been studies conducted both by researchers and students throughout Indonesia related to fuels development from vegetable oils and animal fats. Some of the products that have been studied have even been applied, such soybean oil (*Glycine Max*), jatropha oil (*Jatropha Curcas*), rapeseed oil (*Brassica Napus*), palm oil (*Elaeis Guineensis*), sunflower oil (*Helianthus Annuus*), corn oil (*Zea Mays*), peanut oil (*Arachis*

TABLE I. TOP 10 COUNTRIES IN BIODIESEL POTENTIAL SOURCE

| Ranking | Country | Biodiesel potential (ML) | Production (\$/L) |
|---------|-------------|--------------------------|-------------------|
| 1 | Malaysia | 14,540 | 0.53 |
| 2 | Indonesia | 7,595 | 0.49 |
| 3 | Argentina | 5,255 | 0.62 |
| 4 | USA | 3,212 | 0.70 |
| 5 | Brazil | 2,567 | 0.62 |
| 6 | Netherlands | 2,496 | 0.75 |
| 7 | Germany | 2,024 | 0.79 |
| 8 | Philippines | 1,234 | 0.53 |
| 9 | Belgium | 1,213 | 0.78 |
| 10 | Spain | 1,073 | 1.71 |

Sources (2012, Atabani)

Hypogaea), and cotton oil (*Gossypium Spp.*) [2][7]. With a variety of potential sources of fuel has placed Indonesia in second place. The rankings of fuel producers from vegetable oils and animal fats can be seen in **Table I** above.

In this research has been discussed about one of Indonesia's biodiesel that is kemiri sunan. Kemiri sunan plants (*Reutealis Trisperma Airy Shaw*) is one of the plants that potential to become biodiesel. This is because it contains oil with a yield of about 40-60%. This plant is developed in various cities on Java Island has even spread to other islands such as Sumatra, Nusa Tenggara, until Borneo. The rapid development of kemiri sunan is not only potential as biodiesel but also as an argo ecosystem, which is capable of being used as a conservation crop [8][9].

B. Combustion & Performance of Diesel Engines

The development and use of biodiesel fuel worldwide is one of the efforts undertaken to reduce the emission gas emitted [10]. Gas emission levels resulting from diesel engines are certainly influenced by the quality of these fuels. Fuel quality can be seen from its characteristics such as flash point, pour point, cetane number, density, viscosity, low heating value and many more [11]. Each fuel characteristic of course provides combustion results and different performance on diesel engines.

Theoretically, analysis of diesel engine combustion process can be seen from several aspects such as ignition delay, rate of pressure rise, peak pressure and heat release [12]. Combustion process is the process of burning between fuel injected with turbulent air entering and becoming one inside the engine combustion chamber. The process produces high pressure and temperature up to a certain point of fire occurrence and spreads until a complete combustion process occurs. But in the process it is not directly burning but takes time to reach the process called the ignition delay [13].

Ignition delay is the length of time required when starting fuel injection (*Start of Injection*) until the first combustion occurs (*Start of Combustion*). Where the results are shown in how much degree is taken for process of ignition to explosion. The occurrence of ignition delay is due to process of vaporizing between fuel and air that forms heat reaction and will burn when it has reached the upper limit or critical point of both the mixture. Whether or not the time it takes for the fuel to burn immediately is influenced by fuel characteristics such as the cetane number that serves as an indicator the burned ignition will ignite by itself (autoignites). In addition, this process is important indicator of combustion process because it will affect the quantity of fuel injected into combustion chamber diesel engine. The longer ignition delay the more fuel is injected, and when

the combustion process occurs potentially the occurrence of diesel knock.

Pressure aspect is divided into two stages namely rate of pressure rise and peak pressure. Theoretically the pressure in the combustion chamber is influenced by the quality of fuels such as density, viscosity and low heating value [12][13]. The definition of rate of pressure rise is pressure average that generated from combustion between fuel and air. Then the definition of peak pressure is the highest pressure level of pressure rise. From these two reviews when it has great value it can be concluded that the amount of fuel injected is more than any other fuel. Pressure generated from combustion process is one of the reaction of energy changes between the fuel that changes in addition to being heat. Energy changes to heat in the combustion chamber can be analyzed from heat release. This indicator serves to provide information

related to combustion process associated with pressure and ignition delay.

From the combustion process diesel engine then produced work that can be analyzed from the performance. Definition of performance is the criterion value of engine to assess quality of fuel used. Diesel engines performance is consists of several indicators such as power, torque, BTE, BMEP and SFC [12]. The indicators of performance testing are interconnected. Power is the most important indicator of performance testing, where has the intent as the characteristics of the work produced by diesel engines. The units of power are kN. Then torque is an indicator that has the meaning of rotation force generated per one rotation of diesel engine. Torque has a unit Nm. Brake mean effective pressure is a generated force magnitude between torque and volume of fuel chamber. Specific fuel of

TABLE II. ENGINE SPECIFICATION

| Model | Specification |
|---------------------------------|--|
| Diesel Engine | Yanmar TF-85 |
| Engine Type | DI, 4-stroke, diesel engine, natural aspirated, water cooled |
| Bore x stroke (mm) | 85 x 87 |
| Displacement (cm ³) | 493 cm |
| Compression Ratio | 18:1 |
| No. Of Cylinder | 1 |
| Maximum Power (kW) | 5.2 kW/2200 rpm |

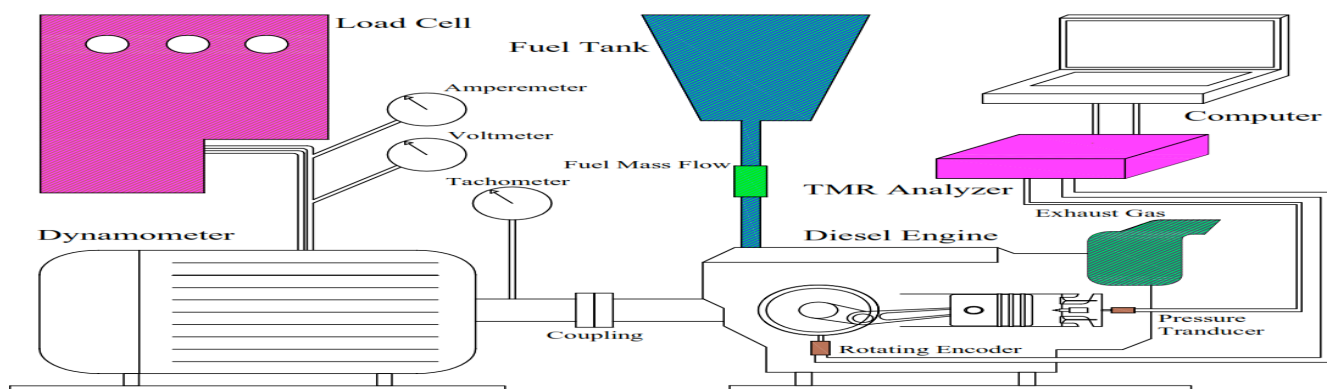


Figure 1. Engine Setup

consumption is the amount of fuel (mass flow rate) that is converted into work in units of time [5]. The value of large or small power, torque, fuel consumption and thermal efficiency generated by a diesel engine is certainly influenced by some indicators of fuel properties such as lower heating value, density and viscosity.

Because fuel properties can provide a very significant impact, especially when the combustion process in diesel engines take place [12].

This research is an analysis of combustion and performance of biodiesel that is kemiri sunan. Where in this study will be tested based on several indicators that will be described in the next chapter. It is intended to find out how much the quality of the fuel to be applied to diesel engines.

V. METHODS

A. Engine Setup

In this research, the method that be used is experiment. Before test performance, a preparation such

as engine setup that will be described in **Figure I**. It also described the engine specifications that can be seen in **Table II**. This test is done on a laboratory scale so that the results obtained still need further development. The engine setup in **Figure I** is an arrangement consisting of a diesel engine with the addition of an outside fuel tank along with its fuel filter. This is done as a form of supervision of fuel flow velocity. Diesel engine is connected with dynamometer and load share to find out how much power is generated. The presence of an ampere meter device and a volt meter to determine voltage and current strength generated by diesel engine.

So from this series of engine setup will produce the form of performance of both fuels.

B. Fuel Properties

After engine setup process is done, next step is knowing a fuel properties of kemiri sunan biodiesel. The process of making both biodiesel both use transesterification process [14]. From these fuel properties will be able to see whether two biodiesels meet predetermined standards (using ASTM and EN ISO). With results of fuel properties that meet standards then combustion and performance test of kemiri sunan biodiesel can be done.

TABLE III. FUEL PROPERTIES OF KEMIRI SUNAN BIODIESEL

| Parameter | Test Method | Limits | Kemiri Sunan Biodiesel |
|--|--------------|------------|------------------------|
| Flash Point (°C) | ASTM D93 | Min 55 | 188 |
| Pour Point (°C) | ASTM D664 | Max 18 | 4 |
| Density at 15°C (kg/m ³) | EN ISO 12185 | 800 – 890 | 880 |
| Kinematic Viscosity at 40°C (mm ² /s) | ASTM D445 | 2.3 – 6.00 | 8.23 |
| Water Content (%) | ASTM D1796 | Min 0.05 | 0.11 |
| Lower Heating Value (MJ/kg) | ASTM D240 | Max 42.934 | 42.379 |

C. Engine Performance Variables

After engine setup and fuel properties done, determination of variables for testing performance. First variable is variable fuel, biodiesel mixed with diesel fuel (Pertamina Dex) owned by Pertamina [15]. The variables of the fuel is B15, B20 and B100 (diesel fuel). Second variable determination is RPM and load variable, diesel engine that used in test is rotated at RPM 1800 and RPM 2200. Then for the load variable used is 20%, 40%, 60%, 80% and 100%. From the determination of the variables above then the next is the data retrieval that will be discussed in the next chapter.

D. Combustion & Performance Test

Engine performance test is performed after both variable fuel and load are determined. The indicators to be taken the results are divided into two, data collection from combustion process and performance test. Data from combustion process consist of pressure, heat release and ignition delay [16]. Data from performance test such as power, torque, brake mean effective pressure, thermal efficiency and specific of fuel consumption. From these two indicators will be analyzed and compared between biodiesel candle holder with diesel fuel (Pertamina Dex) by Pertamina.

VI. RESULT & DISCUSSION

A. Kemiri Sunan Biodiesel Properties Result

The step of making kemiri sunan into this biodiesel using transesterification method. The results of laboratory testing can be seen in **Table III** above. Characteristics that have been tested include density at 15°C, viscosity at 40°C, flash point, pour point, water content, and lower heating value. From several indicators that have been tested, there are 4 indicators that match the criteria of biodiesel which are flash point, pour point, density at 15°C and lower heating value [2]. Based on the standard used for reference of these indicators, there is one indicator that does not meet the standard that is kinematic viscosity at 40°C. This can be due to lack of perfect when the process of making from raw materials into biodiesel.

B. Combustion Test Results

Combustion process results can be seen in some pictures below. **Figure 2** above shows the result of pressure from combustion chamber using three fuels that is kemiri sunan biodiesel (B15, B20) and diesel fuel. **Figure 2a** is a condition where pressure occurs at 1800 rpm rotation and full load. And **Figure 2b** is a condition in which pressure occurs at 2200 rpm and full load. In both diagrams, fuel that be able to reach premix combustion is kemiri sunan biodiesel B15; B20 then diesel fuel.

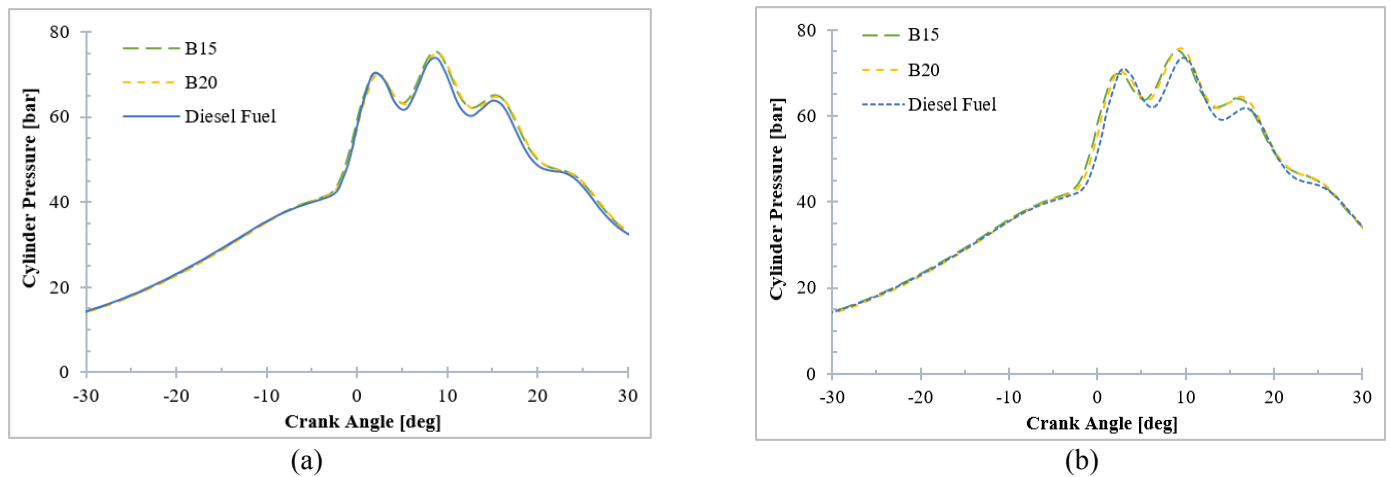


Figure 2. Cylinder pressure diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load

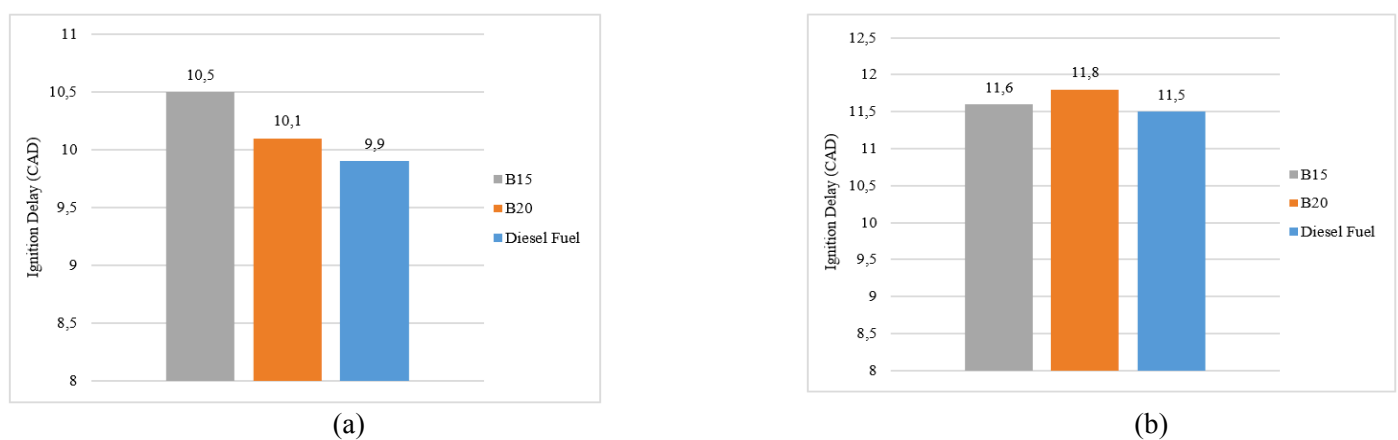


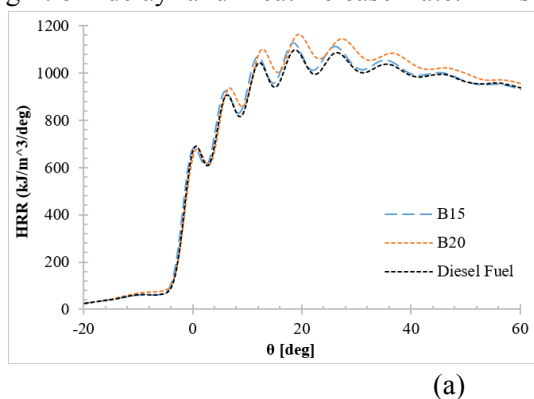
Figure 3. Ignition delay diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load

At full engine speed of 1800 rpm, the pressure on premix and stage combustion of B15 is 70.10 bar at 0° and 76.39 bar at 6° . The pressure on premix and stage combustion of B20 is 68.10 bar at 1° and 74.37 bar at 6.5° . Pressure on premix and stage combustion of diesel fuel is 69.73 bar at 0.5° and 74.32 bar at 6.5° . Furthermore, the conditions on the engine speed 2200 rpm with full load. The pressure on premix and stage combustion of B15 is 69.82 bar at 2.5° and 75.36 bar at 9° . The pressure on premix and stage combustion of B20 is 70.65 bar at 2.5° and 75.65 bar at 9.5° . Pressure on premix and stage combustion of diesel fuel is 70.82 bar at 3° and 73.33 bar at 10° . This indicates influence of mixed characteristics of biodiesel fuel and diesel fuel. However, there is one condition where the premix combustion of B20 fuel is well after B15 and diesel fuel occurs. This could be due to the influence of fuel mixture for low rpm conditions having long burning delay so as to produce pressure that is also longer than the two fuels above. These characteristics affect energy process that changes from chemical to heat and kinetic.

Theoretically, the fuel and air that entering chamber under heterogeneous conditions give non premixed combustion, due to that conditions have not become homogeneous. However, premixed conditions can be obtained if the acceleration of mixing of fuel with air so quickly to provide homogeneous [17][11]. Fuel conditions that are not homogeneous in a timely manner certainly affect the combustion process such as increased ignition delay, temperature, pressure in cylinder and peak HRR [16]. Similar results obtained from the research [18] where using biodiesel fuel produce higher peak pressure when compared with diesel fuel. A non-premix condition is not affected by a change in the ratio of air fuel. However, increased concentration of fuel mixture that will affect energy changes when premix combustion. So as much as possible in the combustion process required fuel that can form a homogeneous mixture because it will provide the effect of optimal combustion efficiency and high peak pressure on the cylinder.

The pressure occurring in combustion chamber is of course not only influenced by fuel characteristics but

also influenced by length of period between injection, mixing and combustion from fuel and air. This case is called ignition delay. In theory, this process is influenced by fuel and engine design. The result of combustion process that is ignition delay from kemiri sunan biodiesel and diesel fuel can be seen in **Figure 3** above. In **Figure 3a** is result of ignition delay from engine speed 1800 rpm and full load, and in **Figure 3b** is result of ignition delay from engine speed 2200 rpm and full load. It can be seen in **Figure 3a** that shorter delay is achieved by diesel fuel and longer delay is achieved by B15. That conditions is inversely to Figure 3b, where these conditions the fastest delay is achieved by diesel fuel, then B15 and last is B20. This is evidenced by the study of [19] which shows that the influence of content from fuel mixture between kemiri sunan biodiesel and diesel fuel (B15, B20). Both of biodiesel characteristics that is viscosity and density contents cause chemical process during combustion takes a long time. So in injection process resulted in delay time is longer than diesel fuel. Combustion process is a combination of interconnected processes. Such as cylinder pressure, ignition delay and heat release rate. This discussion



discusses heat energy generated by combustion in combustion chamber of a diesel engine or so-called heat release rate. Combustion process is a change between chemical energy into kinetic and heat. Chemical energy derived from fuel and mixed with air and very high pressure causes the release of energy into heat and explosion. So energy generated from explosion produces kinetic energy [11].

The final analysis of the combustion process can be seen in **Figure 4** below, which is a diagram for heat release rate (HRR) of kemiri sunan biodiesel and diesel fuel. In **Figure 4a** it is a condition where HRR occurs at 1800 rpm and is full. **Figure 4b** is a condition in which HRR occurs at 2200 rpm and full load. From these two diagrams can be seen the start of combustion that is early fuel kemiri sunan biodiesel B15; B20 then diesel fuel. From which it affects the HRR which is also at the beginning of the position. But there is one condition where the HRR of fuel B20 is far away after B15 and diesel fuel occurs. This could be due to influence of fuel mixture for low rpm conditions having long burning delay resulting in lower HRR.

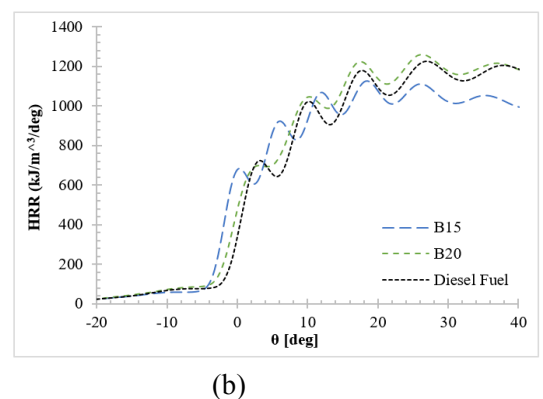


Figure 4. Heat Release Rate diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load

The combustion process results of three fuels can be seen that the effect of low HRR caused by the influence of rapid injecting delay and long duration of combustion in the condition of premix combustion and steady combustion. Especially in biodiesel fuel which has lower HRR than diesel fuel. It is because of the influence of the process of mixing the fuel into the air when in the combustion chamber. Conditions that do not produce homogeneous compositions over time will result in longer delays and decreased HRR. This is similar to the study by [20] which uses biodiesel as fuel and produces

low premix combustion, longer ignition delay, and lower HRR than diesel fuel.

C. Performance Test Results

The performance of the three fuels tested on the diesel engine has been done. Performance tests that have been conducted consist of power, torque, SFC, BTE, BMEP. The explanation will be explained below. Combustion process that occurs in diesel engines is a process of chemical energy changes to heat. Power and torque which is the result of energy can be seen that the energy produced is almost the same among the three fuels. For the highest top power at 1800 rpm engine speed and full load diesel fuel. Then the highest top power on engine speed 2200 rpm and full load achieved by B20. This is due to influence of each fuel characteristics.

Performance results in terms of fuel consumption can be seen in **Figure 5**. Which of three fuels tested results

obtained differed in each condition. In all engine rotation conditions that is 1800 rpm and 2200 rpm with full load, it can be seen that the greatest SCF value is B15 then B20 and diesel fuel. The SCF value to be compared is the curve with the lowest value of each fuel. The initial conditions are 1800 rpm engine speed and full load. The lowest SCF value of B15 is 353.85 g/kWh with a power of 2.05 kW. Then for the lowest SCF value of B20 is 329.4 g/kWh with power of 3.4 kW and the lowest SCF value of diesel fuel is 321.7 g/kWh with power of 3.3

kW. Then the second condition is engine speed 2200 rpm with full load. The lowest SCF value of B15 is 365.10 g/kWh with a power of 4.8 kW, the lowest SCF value of B20 is 340.79 g/kWh with a power of 4.7 kW and the lowest SCF value of diesel fuel is 300.17 g/kWh with a power of 4.9 kW. From the above results, the change in SCF value is of course influenced by the characteristics of fuels such as viscosity, density and lower heating value, where the fuel has different characteristic values.

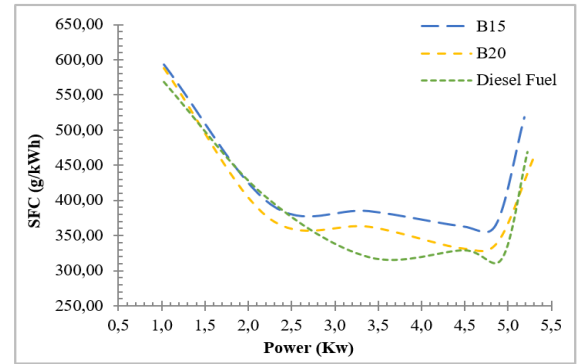
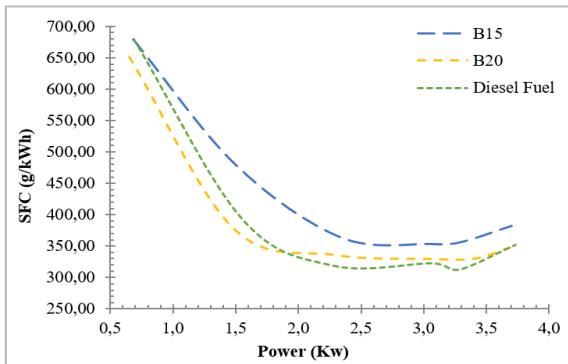
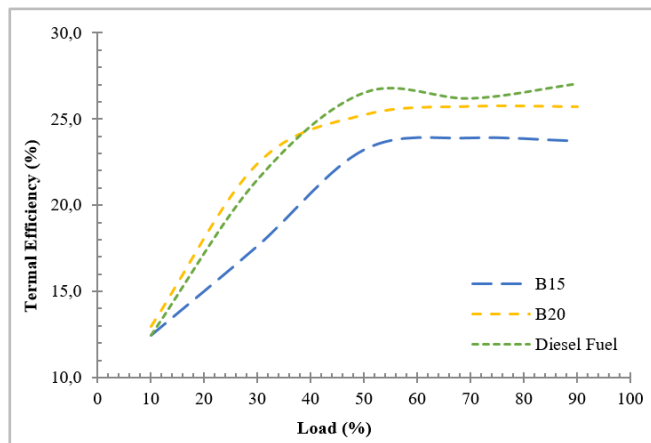
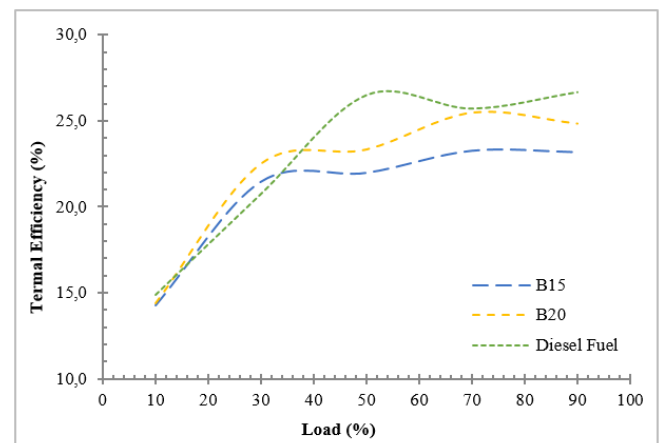


Figure 5. SFC diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load



(a)



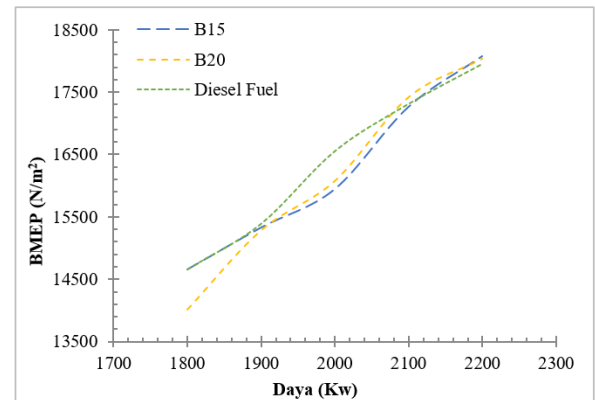
(b)

Figure 6. BTE diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load

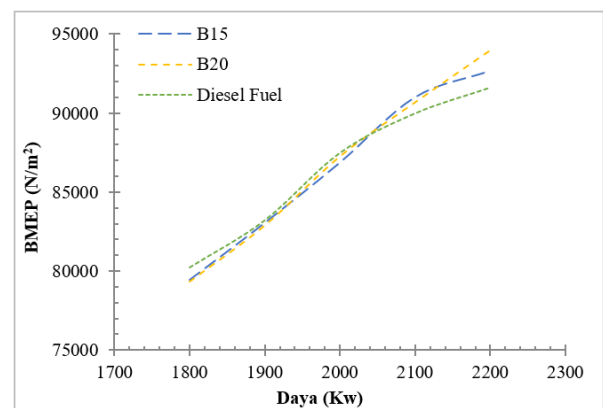
Results of this test can be concluded that decreasing SFOC graphs along with increasing the load on diesel engine due to percentage of fuel required to combustion process decreased compared with the percentage of power generated. However, as the load increases towards the highest SFOC increases due to the number of losses generated to achieve the desired power, requiring a large percentage of fuel injected [21].

Next performance test results is brake thermal efficiency (BTE). This test is to find out how much energy efficiency with unit percent. Test results can be seen in **Figure 6**. In both conditions it can be seen that the highest BTE is achieved by diesel fuel fuel, then B20 and last is B15. In the first condition that is 1800 rpm engine speed with full load. The highest BTE value at full load of diesel fuel is 27.01%, B20 value of BTE is 25.73% and B15 value of BTE is 23.93%. While on the second condition is 2200 rpm engine speed with full load. The highest BTE value achieved by diesel fuel is 25.01%, then the value of BTE achieved by B20 is 24.85% and the BTE value achieved by B15 is 23.19%. From test result can be concluded that thermal efficiency has increased or decreased caused by some indicators of fuel properties such as high density and low heating value. Where the impact on energy changes from fuel to burn and heat energy [19].

The last performance test results is brake mean effective pressure (BMEP). This test is to know the magnitude of the force of torque versus volume in fuel chamber. Test results can be seen in **Figure 3b**. In both conditions it can be seen that the highest BMEP is achieved by diesel B20, then B15 and last is diesel fuel. In the first condition that is 1800 rpm engine speed with full load. The highest BMEP value at full load of B20 is $18,033 \text{ N/m}^2$, B15 value of BMEP is $18,075 \text{ N/m}^2$ and diesel fuel value of BMEP is $17,495 \text{ N/m}^2$. While on the second condition is 2200 rpm engine speed with full load. The highest BTE value achieved by B20 is $93,938 \text{ N/m}^2$, then the value of BTE achieved by B15 is $92,700 \text{ N/m}^2$ and the BTE value achieved by diesel fuel is $91,622 \text{ N/m}^2$. From these results it can be concluded that the energy produced from soybean B20 is greater than B20 porang. This is also due to the influence of fuel properties such as flash point and low heating value [16].



(a)



(b)

Figure 7. SFC diagram under condition (a) engine speed 1800 rpm and full load (b) engine speed 2200 rpm and full load

VII. CONCLUSION

Combustion and performance test results can be concluded that kemiri sunan biodiesel has the potential to become renewable energy fuel. This is because of fuel properties from kemiri sunan has meet the standard, although in this research is not perfect result due to error factor of biodiesel making process. However, it has been proved in various indicators, namely combustion test and performance test which show relatively similar results with Pertamina's fuel diesel fuel. This will provide a future recommendation for better development in order to achieve the use of alternative energy for Indonesia.

Acknowledgement

Authors would like to thank Mr. Nurafandi as a technician from Marine Power Plant Laboratory who has assisted the author in assisting engine setup in this

research. Expectations from study authors can be improved for the better.

References

- [1] M.-V. Joaquin A., C. Soldi, A. M. de Amorim, M. G. Pizzolatti, A. P. de Mendonça, and M. G. M. D'Oca, "Diesel/biodiesel proportion for by-compression ignition engines," *Fuel*, vol. 86, no. 12–13, pp. 1977–1982, 2007.
- [2] A. S. Silitonga, A. E. Atabani, T. M. I. Mahlia, H. H. Masjuki, I. A. Badruddin, and S. Mekhilef, "A review on prospect of *Jatropha curcas* for biodiesel in Indonesia," *Renew. Sustain. Energy Rev.*, vol. 15, no. 8, pp. 3733–3756, 2011.
- [3] W. G. Wan Nor Maawa, R. Mamat, H. H. Masjuki, and G. Naja, "Effects of biodiesel from different feedstocks on engine performance and emissions: A review," *Renew. Sustain. Energy Rev.*, vol. 51, pp. 585–602, 2015.
- [4] O. Can, E. Ozturk, H. Solmaz, F. Aksoy, C. Cinar, and H. S. Yucesu, "Combined effects of soybean biodiesel fuel addition and EGR application on the combustion and exhaust emissions in a diesel engine," *Appl. Therm. Eng.*, vol. 95, no. x, pp. 115–124, 2016.
- [5] L. Wei and P. Geng, "A review on natural gas / diesel dual fuel combustion, emissions and performance," *Fuel Process. Technol.*, vol. 142, pp. 264–278, 2016.
- [6] M. A. Vieira da Silva, B. Lagnier Gil Ferreira, L. G. da Costa Marques, A. Lamare Soares Murta, and M. A. Vasconcelos de Freitas, "Comparative study of NO_x emissions of biodiesel-diesel blends from soybean, palm and waste frying oils using methyl and ethyl transesterification routes," *Fuel*, vol. 194, pp. 144–156, 2017.
- [7] A. E. Atabani, A. S. Silitonga, I. A. Badruddin, T. M. I. Mahlia, H. H. Masjuki, and S. Mekhilef, "A comprehensive review on biodiesel as an alternative energy resource and its characteristics," *Renew. Sustain. Energy Rev.*, vol. 16, no. 4, pp. 2070–2093, 2012.
- [8] M. Herman, M. Syakir, D. Pranowo, Saefudin, and Sumanto, *Kemiri Sunan (Reutealis trisperma (Blanco) Airy Shaw) Tanaman Penghasil Minyak Nabati dan Konversi Lahan*. Jl. Ragunan 29, Pasarminggu, Jakarta: IAARD Press, 2013.
- [9] W. S. Wulandari, D. Darusman, C. Kusmana, and W., "Land Suitability Analysis of Biodiesel Crop Kemiri Sunan (*Reutealis trisperma* (Blanco) Airy Shaw) in The Province of West Java, Indonesia," *J. Environ. Earth Sci.*, vol. 4, no. 21, pp. 27–37, 2014.
- [10] M. M. Abdelaal and A. H. Hegab, "Combustion and emission characteristics of a natural gas-fueled diesel engine with EGR," *Energy Convers. Manag.*, vol. 64, pp. 301–312, 2012.
- [11] K. R. Ed, *Diesel Engine Management*. 2014.
- [12] J. Xue, "Combustion characteristics, engine performances and emissions of waste edible oil biodiesel in diesel engine," *Renew. Sustain. Energy Rev.*, vol. 23, pp. 350–365, 2013.
- [13] R. B. Bernard Challen, *Diesel Engine Reference Book*, Second Edi., vol. 38. Oxford: Butterworth-Heinemann, 1999.
- [14] K. G., "Biodiesel Production from Municipal Sewage Sludges," *Energy Fuels*, vol. 24, p. 5, 2010.
- [15] PT. PERTAMINA (PERSERO), "Material Safety Data Sheet of Pertamina Dex," 2007.
- [16] M. Shahabuddin, A. M. Liaquat, H. H. Masjuki, M. A. Kalam, and M. Mofijur, "Ignition delay, combustion and emission characteristics of diesel engine fueled with biodiesel," *Renew. Sustain. Energy Rev.*, vol. 21, pp. 623–632, 2013.
- [17] L. Bag, "An Investigation of Valve Lift Effect on Air Flow and Coefficient of Discharge of Four Stroke Engines Based on Experiment Abdul Rahim Ismail, Rosli Abu Bakar, Semin Automotive Focus Group, Faculty of Mechanical Engineering," vol. 5, no. 8, pp. 963–971, 2008.
- [18] S. P.K. and D. L.M., "Combustion analysis of *Jatropha*, *Karanja* and *Polanga* based biodiesel as fuel in a diesel engine," *Fuel*, vol. 88, no. 6, pp. 994–999, 2009.
- [19] M. M. Abdelaal and A. H. Hegab, "Combustion and emission characteristics of a natural gas-fueled diesel engine with EGR," *Energy Convers. Manag.*, vol. 64, pp. 301–312, 2012.
- [20] T. A. M. A, W. M., and T. K., "Engine performance and emissions of a diesel engine operating on diesel-RME (rapeseed methyl ester) blends with EGR (exhaust gas recirculation)," *Energy*, vol. 32, no. 11, pp. 2072–2780, 2007.
- [21] H. Raheman, P. C. Jena, and S. S. Jadav, "Performance of a diesel engine with blends of biodiesel (from a mixture of oils) and high-speed diesel," *Int. J. Energy Environ. Eng.*, vol. 4, no. 1, p. 6, 2013.

Manufacturing Bioethanol from Gadung (*Dioscorea hispida*) through One Stage Distillation Unit

¹Deli Kusuma Wardani, ²Nila Wulandari, ³Yunita Tri Andani Muhammad Arifin, ⁴Muhammad Arifin

Chemical Engineering Department
State Polytechnic of Sriwijaya
Palembang, South Sumatera, Indonesia

¹Delikusuma99@gmail.com

²Niwanda17@gmail.com

³Yunitatri.andani@gmail.com

⁴Muhammadarifin554@gmail.com

ABSTRACT

Gadung (*Dioscorea hispida*) is a tuber that is non-food because it contains cyanide (HCN). Starch content in gadung tuber is 30.9% so that it worth to manufacture bioethanol. Bioethanol is a product of hydrolysis of starch to glucose, followed by fermentation of glucose using yeast *Saccharomyces cereviceae* to bioethanol. In this research, bioethanol was made from gadung starch. The hydrolysis process produces 7.85-10.48% glucose and fermentation process produces 5-8.5% crude ethanol. Bioethanol produced from distillation unit was 80%, corresponding to the technical specifications desired. The Design of 1-stage distillation unit has completed, includes the shape and dimensions of the tools, i.e. the main condenser, cylinder-shaped, dimensions of diameter is 32cm and height is 45cm, feeder tank / boiler cylinder-shaped, small scale volume of 5L. At distillation column, the diameter is 9cm and length is 121cm. Column is filled with ceramic or glass type packing inside. Column is equipped with thermometer to measure the temperature of ethanol-water vapor. Two stages distillation unit into one stage can produce 82% ethanol which is fit as fuel for household stoves.

Keywords: Bioethanol; Fuel; Gadung; Starch; Distillation

I. INTRODUCTION

Fuel prices are rising and the world's oil reserves are more limited has prompted efforts to obtain alternative fuels. Various factors such as rising fuel prices, awareness of biosecurity to increase domestic revenue, awareness to reduce greenhouse gas emissions, and the potential to enhance the development of regional influence increased interest for biofuel production.

Bioethanol is an alternative fuel that is environmentally friendly because it is the nature of the fuel oxygenate, are compounds that contain oxygen. Oxygen content makes it a perfect fuel combustion so as to minimize toxic exhaust gas. Exhaust emissions produced from burning bioethanol 19-25% lower compared with fossil fuels. In the gadung tuber chemical elements contained cyanide (HCN), which are toxic. Gadung starchy high enough. Starch are carbohydrates in the form of a polysaccharide polymer such as monosaccharides anhidro the general formula $(C_6H_{10}O_5)_n$. The starch content in the gadung 30.9%, so the tuber is worthy converted into bioethanol as an alternative energy source that is environmentally friendly.

Gadung tuber is kind of tubers that can be used as an alternative source of carbohydrates and is a commodity that has excellent prospects.

TABLE 1. CHEMICAL COMPOSITION OF GADUNG TUBER

| Parameter | Composition |
|-------------------|-------------|
| Water Content (%) | 61.5 |
| Starch (%) | 30.9 |
| Fiber (%) | 1.3 |
| Ash (%) | 1.1 |
| Crude Fiber (%) | 0.93 |
| Total Sugar (%) | 2.45 |
| Cyanide (ppm) | 362 |

The production of bioethanol from starch contained in gadung tuber, is done through the process of converting carbohydrates into sugar (glucose). In the enzymatic hydrolysis is known there are two methods: SHF and SSF.

SSF methods need to be developed because it can shorten the process of making bioethanol. The process of simultaneous hydrolysis and fermentation (SSF) is done conventionally by heating 95-120°C.

II. EXPERIMENTAL METHODS

Stages of the process of making ethanol from gadung tuber include pretreatment, hydrolysis, fermentation and purification. In the process of gelatinization and liquefaction of heat required to raise the temperature to 90°C, followed by saccharification process, requiring cooling to 60°C.

At the pretreatment stage, retrieved gadung tuber starch. The next stage is the process of hydrolysis of starch. Hydrolysis of starch can be carried out with the help of acids or enzymes at a temperature, pH, and specific reaction time. Hydrolysis was followed gluco-amylase to hydrolyze the α -1,4-glucoside bond and α -1,6-glucoside to produce glucose. Gluco-amylase is added in order to enzymatic hydrolysis process for converting starch into glucose more produced, because gluco-amylase can break the bond of starch that has not been cut by the addition α -amylase.

Then, the fermentation process lasts for 7 days by using *Saccharomyces cerevisiae*. Furthermore, the fermentation is done in trials of 0, 24, 48, 72 hours. However, the optimum fermentation achieved in 48 hours with an alcohol content 7-8%, with 2.5% concentration of the enzyme. In this study, simultaneous hydrolysis and fermentation (SSF) with conventional heating 95-120°C.

Furthermore, the distillation process. Purification by distillation frequently encountered is the separation of ethanol-water. Ethanol purified water from a mixture of ethanol through distillation. Ethanol formed after the fermentation process is not more than 10 vol%. Fermented containing less than 10 vol% ethanol heated to remove CO₂ and fed to the next column.

Purification of the ethanol yield is generally conducted with two stage distillation method. Two stages distillation are shown in Figure 1. This tool will be engineered into one stage distillation to produce bioethanol as a household fuel (ethanol content of at least 75%).

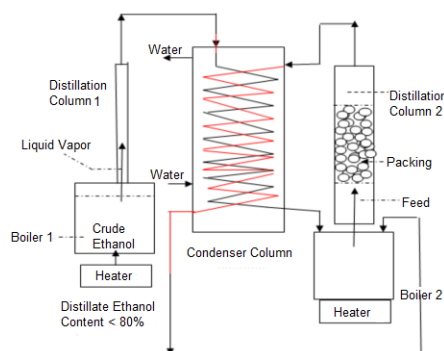


Figure 1. Schematic ethanol purification by distillation in two stages, before engineered

Results of final ethanol has the following composition azeotropic point, the average level 94%. Engineering will be done that is operating a two stages distillation engineered into a one stage by optimizing the packing in the column to get the optimum ethanol.

III. RESULT AND DISCUSSION

A. How the effect of enzyme concentration on glucose levels?

Hydrolysis process results are presented in Table 2:

TABLE 2. THE EFFECT OF ENZYME CONCENTRATION ON GLUCOSE LEVELS

| Volume Enzyme (ml) | | Glucose Content (%) |
|--------------------------|------------------------|---------------------|
| α -Amilase Enzyme | Gluco - Amilase Enzyme | |
| 2 | 2 | 8.62 |
| 4 | 4 | 10.48 |
| 6 | 6 | 7.85 |

Based on table 2, the α -amylase enzyme and gluco-amylase enzyme is able to convert carbohydrates into glucose. The highest glucose level that is 10.48%, resulted from the variable α -amylase enzyme and gluco-amylase enzyme as much as 4 ml. The ability of the α -amylase enzyme and gluco-amylase to break down carbohydrates into glucose caused by α -amylase enzyme is able to break the α -1,4 randomly on the inside of both the molecule amylose and amylopectin into dextrin.

B. How yeast mass effect on levels of bioethanol and the effect of performance on the final results of ethanol of two-stage distillation?

The results of the process of fermentation and fractional distillation are presented in Table 3:

TABLE 3. THE RESULTS OF FERMENTATION AND FRACTIONAL DISTILLATION PROCESS

| Mass Yeast (gram) | Bioethanol Content (%) | | |
|----------------------|------------------------|--------------|------|
| | Fermentation | Distillation | |
| | | 1 | 2 |
| 12 | 8 | 29 | 92 |
| 36 | 10 | 30 | 93.5 |
| 60 | 9 | 30 | 92 |

The fermentation process can produce only the highest ethanol 11%. In order to achieve a viable bioethanol used as fuel for domestic stoves with a minimum content 75% is done fractional distillation. At one stage distillation process, produced bioethanol with levels 30%. For further purification is done two stages distillation using the packing material type of glass that is capable of producing bioethanol with decent levels 93.5% is used as fuel for household stoves.

C. How the results of the bioethanol production by using one stage distillation process?

In engineering two stages distillation into one stage distillation are shown in Figure 2.

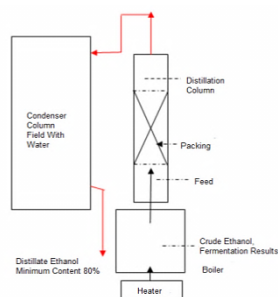


Figure 2. Results of engineering two stages distillation into one stage distillation

TABLE 4. RESULTS OF ONE STAGE DISTILLATION

| Ethanol Content (%) | |
|---------------------|---------------------------|
| Fermentation | Distillation Of The Stage |
| 8 | 70 |
| 10 | 82 |
| 9 | 75 |

The result of one stage distillation produced ethanol with a minimum content 70% can be achieved by manipulating tools. The design of the one stage distillation step includes the main condenser, cylindrical, diameter 32 cm, length 45 cm, whereas for the boiler, the volume 5 liters. Dimensionless distillation column diameter of 9 cm, length 12 cm, containing gasket of ceramic material. Design one-stage distillation, including the shape and size of tool the shown in Figure 3. The materials used for distillation is a food grade stainless steel.

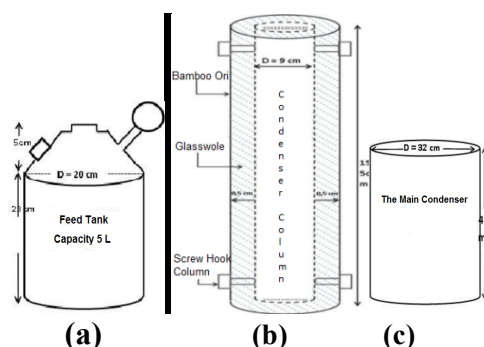


Figure 3. The Design Tools of One Stage Distillation :
(a). Boiler, (b). Distillation Column and
(c). Main condenser

Results of final ethanol has the following composition azeotropic point, the average level 94%. Engineering will be done that is operating a two-stages distillation engineered into one stage by optimizing the packing in the column to get the optimum ethanol.

Engineering distillation tools has many advantages, among others :

1. Eliminate 1 column distillation operation thus saving time, effort and cost.
2. Save 1 boiler as a vaporizer, thus saving fuel costs and the cost of tools.
3. Content of ethanol yield obtained almost the same when compared to the two stages distillation operation, ie at least 80%.

IV. CONCLUSION

Utilization of gadung tubers as bioethanol fuel to produce alternative energy in order to overcome the energy crisis without disturbing food sustainability. In the process of hydrolysis, the additional volume of the alpha-amylase enzyme and gluco-amylase to glucose produced. The highest levels of glucose produced by the increased volume of the alpha-amylase enzyme and gluco-amylase as much as 4 ml in 3500 ml of substrate (0.12% v / v). In the fermentation process,

the addition of yeast mass at 1.02% v / w produced crude ethanol content 10%. In engineering tools of two-stages distillation into one stage distillation process can produced the highest ethanol content 82% which is fit for use as fuel for household stoves.

ACKNOWLEDGEMENTS

Alhamdulillah rabil 'alamin, we are very grateful to Allah subhanahu wa ta'ala for blessing to complete this paper.

First, we present our deepest appreciation to Mr. Hargono who gave us permission to use the results of his research as our main literature of this paper.

Second, our greatest appreciation to our instructor who has helped him patiently finishing this paper by giving suggestion, guidance, and correction until the completion of this paper.

Finally, we would like to say thanks to our beloved parents, family and friends who remind us to to keep going and never giving up. This paper is far from perfect, but it is expected that it will be useful not only for us but also for the readers. For this reason, we hope constructive suggestion and critics from the readers.

Thank you

REFERENCES

- [1] BRETHAUER, S. and Wyman, C. E. **(2010)**. *Review: Continuous hydrolysis and fermentation for cellulosic ethanol production*. Bioresource Technology.
- [2] FOGARTY, W. M. and Kelly, C.T. **(1979)** *Starch degrading enzymes of microbial origin*, in: Progress in Industrial.
- [3] HARGONO. **(2012)** *Pembuatan Bioetanol Fuel Grade dari Singkong Karet (Manihot glaziovii) melalui Proses Destilasi – Adsorpsi menggunakan Adsorben Zeolit*. Bandung: Prosiding Seminar Nasional Teknik Kimia , Universitas Parahyangan, ISSN: 2252-6005, Page 19-23.
- [4] HARGONO. **(2015)** *Pemanfaatan Umbi Gadung Beracun (Dioscorea hispida) sebagai Bahan Baku Pembuatan Bioetanol untuk Bahan Bakar Kompor Rumah Tangga: Perancangan Distilasi Satu Tahap*, Prosiding Seminar Nasional Teknik Kimia 2015, Universitas Diponegoro Semarang, 18 Maret 2015, ISSN 1693-4393.
- [5] LI, P and Zhu, M. **(2011)** *A Consolidated Bio-Processing of Ethanol from Cassava Pulp Accompanied by Hydrogen Production*. Bioresource Technology, 10471-10479.
- [6] PRIHANDANA and Rama. **(2008)** *Bioetanol Ubi Kayu: Bahan Bakar Masa Depan*. Jakarta: Agromedia Pustaka.S.
- [7] SUKUMARAN, R. K. **(2008)** *Cellulase Production Using Biomassa Feed Stock and Its Application In Lignocellulosa Saccharification for Bioetanol Production*. Renewable Energy. Vol 30. Page 1- 4.

Determination of Optimum Condition on Coal Desulfurization by Electrolysis Method

¹Chindyka Kurnia Dewi, ²Muhammad Marco Sayputra, ³Septiani Wulandari and ⁴Yuda Pratama

Advisor : Azharuddin, S.T., M.T.

¹Mechanical Engineering Department, State Polytechnic of Sriwijaya,

^{2,3,4}Chemical Engineering Department, State Polytechnic of Sriwijaya,
Palembang, South Sumatera, Indonesia.

¹chindyka_kurniadewi@yahoo.com, ²m.marcosayputra@gmail.com, ³septianiwulandari80@gmail.com,

⁴yudapratama28@gmail.com

ABSTRACT

Inorganic sulfur in coal consists mostly of iron sulfides called “pyritic sulfur” that is covalently bound to the carbon atoms. Before being used as a fuel, coal needs to be given early treatment desulfurization in an effort to reduce emissions of SO₂ that could pollute the air because of coal combustion. Some method has been applied to reduce sulfur content and most of the effective coal desulfurization are based on chemical method. One of them that being hotly debated is electrolysis. This research is purposed to find the optimum condition for reducing sulfur content on lignite coal by electrolysis method. In this research, H₂SO₄ is used as the electrolyte solution, while for anode and cathode is using graphite and stainless steel. The optimum condition is obtained at 0,3 M H₂SO₄ with speed of 100 rpm stirring for 60 minutes operation time which decreases sulfur content of 75%.

Keywords: coal, sulfur, desulfurization, coal electrolysis

I. INTRODUCTION

Coal is one of the main sources of world energy^[1]. Economic growth and industrialization in developing countries are leading to increase energy demand rapidly. In other words, an increased demand in the use of coal, which is inexpensive and readily available, for power plant and heat process. When coal is burned, generally 90% or more of the sulfur present in it is emitted into the atmosphere as sulfur oxides (mainly SO₂), if desulfurization methods are not applied before, during, and after combustion. It is well-known that SO₂ emissions are considered one of the main causes of acid rain, which leads to the acidification of soils, forests, and surface water^[2].

The growth in coal-fired capacity has therefore led to increasing concern about environmental issues, such as increased emissions of SO₂, nitrogen oxides (NO_x), trace elements, and particulates, although most effort has been directed towards the control of SO₂

emissions. Many effective method are applied to reduce sulfur content on coal, but most of them is chemical method. This paper serves how an electrolysis reduces sulfur content and to know the optimum condition of process by varying electrolyte concentration and operation time.

II. EXPERIMENTAL METHODS

A. Time and Place

This research was held on October 6th, 13th and 20th 2016 at Energy laboratory and Coal Analysis laboratory State Polytechnic of Sriwijaya, Palembang South Sumatera.

B. Materials and Tools

Materials

1. Lignite Coal
2. Sulphuric Acid
3. Aquadest

Tools

1. Electrolysis kit
2. Beaker glass

3. Magnetic stirrer
4. Hot plate
5. Graphite electrode
6. Stainless steel electrode
7. Sulfur determinator (S-144 DR)

C. Preparation and Experiment Planning

Before starting the experiment, coal has ever been prepared. Coal must be dried and reduce the size of 60 mesh. The unit design of coal electrolysis shown in Fig.1.

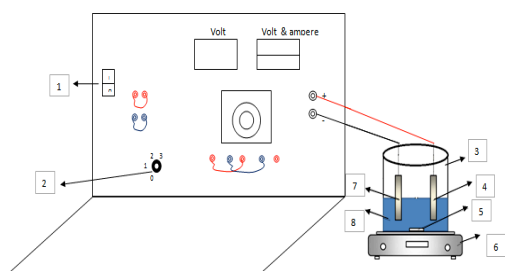


Figure 1. The Desulfurization by Electrolysis Method

Figure Information

1. Power
2. Adopter
3. Beaker glass 1000 ml
4. Graphite (anode)
5. Magnetic Stirrer
6. Hot Plate
7. Stainless steel (cathode)
8. H_2SO_4

D. Experimental Procedures

1. Prepare 250 gram lignite coal into size of 60 mesh for nine times experiment.
2. Measure the sulfur content on the sample before enter the desulfurization unit using sulfur determinator.

2. Prepare sulphuric acid with variety concentration (0.1M, 0.2 M and 0.3 M) 250 ml into the beaker glass.
3. Put the electrode into the beaker glass.
4. Set the voltage and use the stopwatch to measure the time.
5. Dilute the sample with the electrolyte solution.
6. Switch on hot plate so the magnetic stirrer will be turning.
7. Measure the reduced sulphur using after 30, 60 and 90 minutes using sulfur determinator.

E. Observation

After collecting the data, the reduced sulfur will be known by determine sulfur content using sulfur determinator (S-144 DR) at Coal Analysis laboratory State Polytechnic of Sriwijaya, Palembang South Sumatera.

III. RESULT AND DISCUSSION

IV.

Sulfur on Coal

There are three types of sulfur that exist in coal, they are :

1. Pyrite Sulfur

Pyrite Sulfur is the most commonly found in coal. Based on it's crystal system, pyrite is divided into isometric and marcasite shaped^[3]. Pyrite (FeS_2) is a mineral that contributes greatly to the sulfur content in, coal [4].

2. Organic Sulfur

Organic Sulfur is an element in the structure of macro molecules in the presence of coal is partially conditioned by the content of elements derived from the original plant material. In the geochemical conditions and specific microbiological, inorganic sulfur can be transformed into organic sulfur[5].

3. Sulphate Sulfur

Sulphate sulfur content is usually lower no unless coal has obsolenced and some will be oxidized pyrite mineral sulfate [6].

What is Desulfurization by electrolysis method ?

Coal desulfurization is a chemical process for the removal of sulfur from a coal. This experiment use electrolysis method that is evaluated by the electrolyte concentration and operation time to decrease sulfur content.

Desulfurization of coal is needed to minimize environmental pollution caused by emissions of sulfur dioxide during combustion and improve the quality of coal. Conditions in the early seas were such that simple chemical reactions could have generate the range of amino acids that are the building blocks of life[7].

The coal desulfurization process is electrolysis method. In the process of electrolysis current flow into the glass to be supplied into the reactor through the cathode and anode that binds the ions solution of $\text{H}_2\text{SO}_4 + \text{FeS}_2$ (pyrite sulfur in coal) so as to sever bond FeS_2 in coal. Electrolyte solution that is used in this experiment 500 ml H_2SO_4 solution with varying concentrations of 0.1 M 0.2 M and 0.3 M with some process variables of times and stirring speed.

The complete reaction of the process will be explained below.

1. Reaction on electrolyte solution :

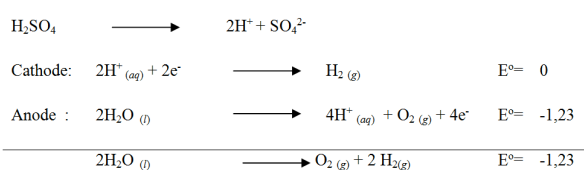


Figure 2. Reaction on Electrolyte Solution^[8]

2. Reaction on sulphur on coal

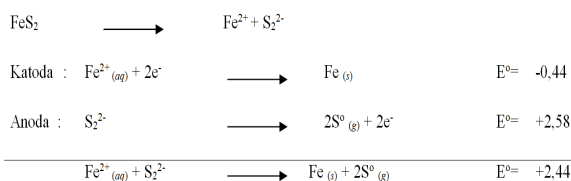


Figure 3. Reaction on Sulphur on Coal^[8]

Coal Electrolysis Result

On this research, lignite coal with size 60 mesh is used as a sample. This coal is assumed still have “pyritic sulfur”. The result data of this experiment shown in Figure 3 and Table 1.

Coal Electrolysis Operation Condition

Material = Lignite coal 60 mesh
Electrolyte = H_2SO_4
Volume = 1000 ml



Figure 3. Coal Desulphurization by Electrolysis Method

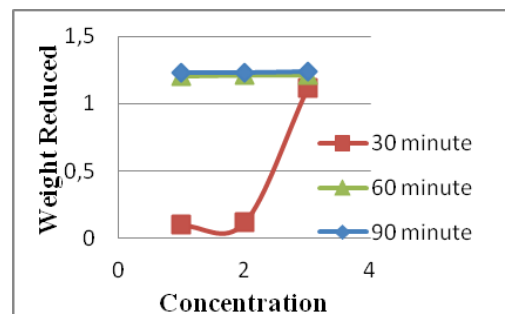


Figure 4. The Relation Between Weight Reduced, Concentration and Operation Time

Table 1. Coal Electrolysis Result

| No | Concentration H ₂ SO ₄ M | time (min- ute) | Sulphur content | |
|----|--|-----------------------|-----------------------------|----------------------------|
| | | | Before Electrol- ysis | After Electrol- ysis |
| 1 | 1 | 30 | 3,5554 | 1,1476 |
| 2 | 2 | | 3,5554 | 1,1273 |
| 3 | 3 | | 3,5554 | 1,0856 |
| 4 | 1 | 60 | 3,5554 | 0,8921 |
| 5 | 2 | | 3,5554 | 0,8893 |
| 6 | 3 | | 3,5554 | 0,8885 |
| 7 | 1 | 90 | 3,5554 | 0,8887 |
| 8 | 2 | | 3,5554 | 0,8886 |
| 9 | 3 | | 3,5554 | 0,8885 |

Based on the data of this experiment, the optimum condition of this process is obtained at 0,3 M H₂SO₄ with speed of 100 rpm stirring 60 minutes operation that decrease sulphur content of 75%.

From the data it's also known that electrolysis reduce not only sulphur if the process run a long time operation. This others reduced content should be analyzed and may decrease the quality of coal.

CONCLUSION

The desulfurization of coal by electrolysis method is used to reduce a sulfur content in coal. The reduction of sulfur content in coal by electrolysis method occurs due to the reaction of reduction and oxidation (redox) on sulfur ions by standard reduction potentials possessed sulfur ions. The greater the concentration of a reagent solution, the greater the rate of reaction. This is caused by the higher percentage of catalyst that can reduce barriers to the electrolyte[9]. Mixing speed will affect the rate of diffusion of the particles solution that will increase the rate of diffusion of particles, and stirring of time for each variation of the concentration solution also has an effect on the binding FeS₂ (pyrite sulfur in coal) by H₂SO₄.

The optimum operation condition is obtained at 0,3 M H₂SO₄ with speed of 100 rpm stirring 60 minutes operation that decrease sulfur content of 75%. Desulfurization by electrolysis method is very promising method for the future of coal industry because of it's simple reaction, low cost operation and

easy to applied for industry like power plant and others.

REFERENCES

- [1] U.S. Energy Information Administration. **2015**. http://www.eia.gov/energyexplained/coal_environment. Accessed : December, 5th 2016.
- [2] Yasuo Ohtsuka. **2004**. Desulfurization of coal. Vol.I,2.
- [3] Taylor G.H, *et.al*. **1998**.
- [4] Organic Petrology. **1998**.
- [5] Wiser W.H. **2000**.
- [6] Meyers, 1982 and Kasrai et.al. **1996**.
- [7] Chemical Properties of Sulfur. **2015**. Sulphur in the environment. <http://www.lenntech.com/periodic/elements/s.htm> 1. December, 5th 2016.
- [8] Jing, Xing. **2009**. Coal Electrolysis to Produce Hydrogen at Intermediate Temperatures. Journal.
- [9] Ramayanti, Fitri. **2016**. Desulfurisasi Batubara Dengan Metode Elektrolisis Ditinjau dari Konsentrasi H₂SO₄ dan Kecepatan Pengadukan. Palembang : Politeknik Negeri Sriwijaya.

Effect of Centrifugation to Inhibit Tea Cream Formation in Concentrated Black Tea

Muhammad Rafiq^{1*}, Piyaporn Chueamchaitrakun^{1,2} and Theerapong Theppakorn¹

¹Food Technology Program, School of Agro-Industry

²Tea Institute

Mae Fah Luang University

Chiang Rai 57100, Thailand

55951401004@lamduan.mfu.ac.th

ABSTRACT

Tea cream (TC) is the important problem of the storage of concentrated black tea (CBT), before distribution to ready to drink industry. It has characteristics of colloidal and insoluble compounds, resulting many economic losses. A simple and effective methods are still required for CBG industry. The objectives of this research was to reduce TC occurred using several speed of centrifugation. CBT was centrifuged at speed 2,000, 4,000, 5,000 and 6,000 RPM for 20 minutes, and the clear fraction was stored at room temperature for 21 days. The untreated CBT was also performed as a control. Samples were taken to analyze caffeine (CF), total catechin content (TCC), gallated catechin (GaC), ungallated catechin (uGaC), theaflavin (TF), thearubigin (TR), colour, turbidity and %TC. It was found that tea cream formed rapidly within 1 day of storage for the control. Surprisingly, centrifugation can slow down the TC formation as long as 21 days. The results showed that the turbidity was increased during storage and no significant difference ($p>0.05$) with the control. As the TC formed, TPC, TF and TR decreased. Caffeine, TCC, GaC and uGaC significantly decreased as the amount of TC increased. The obviously decreased amount of GaC led to the assumption that it was the major component causing TC formation in CBT. Centrifugation was recommended for CBT industry which the minimum speed required for effective prevention of TC was 4,000 RPM.

Keywords : Black tea, concentrated black tea, centrifugation, tea cream, gallation

I. INTRODUCTION

Tea is a rich source of polyphenols that can be used as a supplement in several products, to increase the health benefits. Tea polyphenols have a high economic value and can be applied in several areas, such as food, cosmetics and pharmaceuticals. The manufacturing process determines the type of tea produced, in general three different types are commonly consumed: green tea (unfermented), Oolong tea (partially fermented) and black tea (fully fermented) [3,5]. Black tea is manufactured through fermentation of fresh tea leaves by the enzymatic polymerization of simple polyphenols using principally the catalyst polyphenol oxidase and atmospheric oxygen.

A problem associated with RTD tea production is a phenomena known as ‘tea creaming’ [9,11,17]. Hot black tea infusions produce cloudy precipitation on cooling, which are known as tea cream, and contain up to 30% of the total solids. Tea cream contains many of the compounds that provide taste and color in black tea, and its formation therefore gives rise to a loss of both taste and color, as well as a cloudy appearance to the tea [1,10]. It is thus deleterious both for the consumer and for the producer, especially for producers of ready-to-drink teas, who need to prepare tea infusions at high solid concentrations and for whom cloudy solutions are undesirable. The main constituents of black tea cream

were thearubigins (TRs), theaflavins (TFs) and caffeine concluded that the formation of tea cream was governed by various molecular types of interactions including polyphenol–caffeine complexation and polyphenol–polyphenol interactions. Polyphenol–caffeine complexation is influenced by a number of gallate and hydroxyl groups of the polyphenols [2,6,15].

The factors affecting cream formation in black tea include the extraction temperature, the pH and the concentration of the infusion [20]. The extraction of black tea at a temperature below 35°C would produce an infusion incapable of creaming. When the pH of the solvent was maintained at 4, the maximum amount of black tea cream was formed. The complexation of polyphenols by association of their galloyl groups and their limited solubility is said to be a main driver in cream formation [7]. Although not an initiator of tea cream and not an essential part, caffeine binds with galloyl groups and tea cream moieties, increasing their mass and density. The presence of Ca^{2+} ions exacerbates cream formation through charge compensation given the negative charge carried by TFs in solution at the pH of infused tea [13,16]. H^+ is thought to encourage cream formation by stimulating polyphenols to interact with polysaccharides and nucleophilic groups on proteins.

The solubility of tea cream constituents is enhanced by the absence of caffeine or gallate esters [4,8]. However, theaflavins and other high molecular weight polyphenols are preferential to caffeine in partitioning into the cream phase. Caffeine and theaflavin have also been shown to associate with themselves and each other which further demonstrates the complexity of tea cream formation [9]. Caffeine has a bitter taste whilst theaflavin contributes to its characteristic astringent taste. These associations cause a depletion of theaflavin and caffeine which will affect the taste of tea.

De-creaming is an important step in the process to meet the cold stability requirements of RTD tea. Conventional de-creaming employing any separation technique would result in loss of flavor, color, and taste including health enhancing polyphenols since tea cream composition is similar to tea [18]. Besides establishing clarity, storage stability, and assessing the tea quality parameters, efforts were made to obtain maximum yield of tea solids as well as greater polyphenols content in the clarified product in the centrifugation process. Centrifugation can separate the tea cream with normal components inside concentrated black tea. Therefore, the aim of this study was to assess the effectiveness of centrifugation to prevent tea cream formation in concentrated black tea and identify the characteristic of physical and chemical changes.

II. MATERIALS AND METHODS

Black tea was purchased from Raming Tea®, Chiang Mai Thailand in 2016. Standards and chemicals, including gallic acid, caffeine (CF), catechin (C), catechin gallate (CG), epicatechin (EC), epicatechin gallate (ECG), epigallocatechin (EGC), epigallocatechin gallate (EGCG), gallic acid (GA), gallic acid gallate (GCG), and trifluoroacetic acid (TFA) from Sigma Aldrich®, Canada. Acetonitrile and Folin-Ciocalteu's phenol reagent from LobaChemi®, India. Anhydrous sodium carbonate and sodium hydrogen carbonate from Ajax Finechem®, New Zealand. Ethyl acetate and methanol were purchased from Fisher®, UK and RCI®, Thailand.

2.1 Black tea extraction and concentrated black tea preparation

Extracts were prepared from black tea with a water-to-tea ratio of 20:1 for 25 min at 80°C. The extracts were cooled and filtered by using filter paper Whatman® No.4 before concentrating by rotary evaporator (Eyala®), at 80°C. the concentrating process was done until the total solids of 35% was obtained.

2.2 Effects of centrifugation

CBT were added into closed tubes and then centrifuged at speeds of 2,000, 4,000, 5,000 and 6,000 RPM for 20 minutes. After centrifugation, clear fraction were separated and stored for 21 days at room temperature (25°C). The untreated CBT was done as a control. All samples were taken periodically to monitor the tea cream by analyzing physical and chemical parameters. All samples were performed in triplicate.

2.3 Analysis

2.3.1 Chemical

2.3.1.1 Caffeine (CF) and total catechin content (TCC)

CF and TCC in CBT samples were analyzed by High Performance Liquid Chromatography (HPLC) as ISO 14502-2:2005. The mobile phase consisted of acetonitrile and 0.05%TFA at a ratio 13:87%v/v. CBT was diluted, dilution factor 100, filtered through a 0.45 µm nylon filter and then inject to HPLC. The HPLC conditions were as follows: injection volume, 10 µl; column, temperature, 35°C, isocratic elution, flow rate 1 ml-min⁻¹; Photodiode Array detector (Waters, Shanghai Corporation, Shanghai, China) at 210 nm.

2.3.1.2 Total polyphenol content (TPC)

TPC was determined by a colorimetric assay using Folin Ciocalteu's phenol reagent with gallic acid as standard according to a method specified by the International Standard (Methods: ISO 14502-1, 2005). The dilution of CBT (DF 2500) was used in the analysis. The reaction mixture was prepared by mixing 1 ml of dilution CBT, 5 ml of 10% Folin-Ciocalteu's reagent dissolved in water and 4 ml 7.5% anhydrous sodium carbonate. Blank was concomitantly prepared, containing 1 ml distilled water, 5 ml 10% Folin-Ciocalteu's reagent dissolved in water and 4 ml of 7.5% of anhydrous sodium carbonate. The samples were there after incubated in room temperature for 60 min. The absorbance was determined using spectrophotometer at 765 nm. The samples were prepared in triplicate for each analysis and the mean value of absorbance was obtained. The same procedure was repeated for the standard solution of gallic acid and the calibration line was construed. Based on the measured absorbance, the concentration of phenolic was read (mg/ml) from the calibration line; then the content of phenolics in sample was expressed in terms of gallic acid equivalent (g/100ml).

$$TPC = \frac{(As - b) \times Vs \times DF \times 100}{m \times 10000}$$

As = Absorbance (765nm)
B = Y-intercept

$V_s = 100\text{ml}$
 $DF = \text{dilution factor}$
 $m = Y\text{-ax}$

2.3.1.3 Theaflavin (TF) and thearubigin (TR)

TF and TR were analyzed spectrometrically on a Shimadzu ® UV-2450 UV-Vis spectrophotometer. Each CBT sample was extracted in triplicate for the determination of the TF and TR fractions. The dilution of CBT (DF 100) was used. To determine TF and TR, 50 mL of the cool, well-shaken and filtered standard tea infusion were mixed with 50 mL of ethyl acetate.

1) Preparation of Solution A: A 4 mL portion of the ethyl acetate layer was taken and made up to 25 mL with methanol.

2) Preparation of Solution B: 25 mL of the remaining initial ethyl acetate layer were partitioned with 25 mL of 2.5% aqueous sodium hydrogen carbonate and the aqueous layer was discarded. A 4 mL portion of the washed ethyl acetate layer was made up to 25 mL with methanol.

3) Preparation of Solution C: 2 mL of saturated oxalic acid aqueous solution and 6 mL of water were added to a 2 mL portion of the aqueous layer left from the first extraction with ethyl acetate, and diluted to 25 mL with methanol.

Blank preparation is using same method with before but without using tea extract in the mixture. Measure the absorbance by using UV-VIS spectrophotometer on 380 nm for all of solutions.

$$\% \text{Theaflavin} = 2.25 \times E_1$$

$$\% \text{Thearubigin} = \frac{[375 \times 0.02 \times 6.25 (AC + AA - AB)]}{[0.733 \times 9]}$$

E_1 = Absorbance of Solution A at 380 nm after setting the reference point of the instrument using blank.

AA = Absorbance of solution A at 380 nm after setting the reference point of the instrument using blank

AB = Absorbance of solution B at 380 nm setting the reference point of the instrument using blank

AC = Absorbance of solution C at 380 nm setting the reference point of the instrument using blank.

2.3.2 Physical

2.3.2.1 Tea cream (TC)

TC solids (cold water insolubles) were determined after centrifuging at 2,000 RPM for 10 min to remove the cold water insolubles and determining the soluble solids in the supernatant.

The difference between the estimates of soluble solids in the primary extract and its supernatant was taken to indicate the amount of 'cream' separated on cooling (Figure 1).

2.3.2.2 Turbidity

Analysis of turbidity was performed with turbidity meter. The measurement unit was expressed as formazin turbidity unit (FTU). The dilution of CBT (DF 100) was used. Each sample was measured five times and the average value was calculated. The method was based upon a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension. The higher the intensity of scattered lights, the higher the turbidity.

2.4 Statistical analysis

All data analysed by the variance to identify different among means by using SPSS program at $p < 0.05$. Experimental design of this research using complex randomized design with ANOVA as the method and using descriptive test.

III. RESULTS AND DISCUSSION

3.1 Chemical

3.1.1 Total Polyphenol Content, Theaflavin and Thearubigin

Main characteristic of black tea was brown to dark colour, it was caused by chemical component as the results from oxidation. Polyphenol content will be decreased within TF and TR was formed as the results from oxidation [8]. In this research TPC, TF and TR were investigated to see the reduced quantity during storage for untreated and treated sample. This was necessary to do, because three of that component had a direct impact with the characteristic of CBT. Not only affected to the characteristic of black tea but also that components contributed to TC formation occurred. Figure 1 showed that tea cream formed and increased during storage time. The control (untreated CBT: I) remarkably showed TC higher than (treated CBT: II, III, and IV). The longer storage time than higher TC (figure. 1A and figure 1B). The higher speed of centrifugation the lower TC formed (figure 1B: II, III and IV).



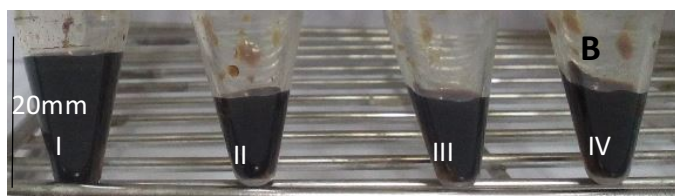


Figure 1. TC increased during observation days: (A) 5 days, (B) and 15 days; (I) control, (II) 4,000RPM, (III) 5,000RPM and (IV) 6,000RPM.

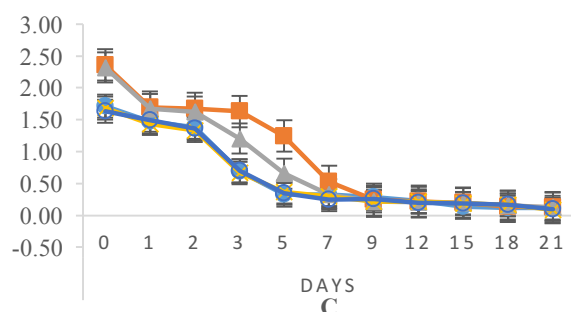
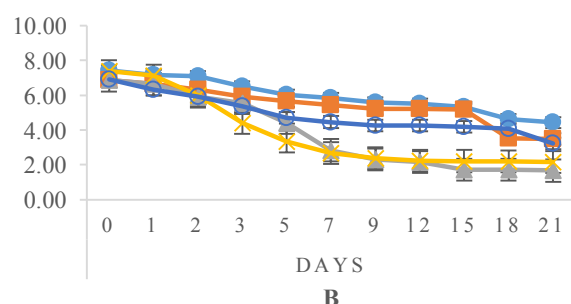
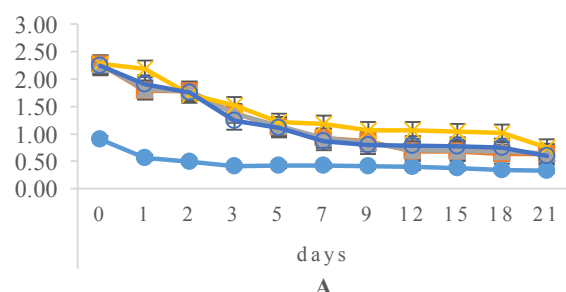


Figure 2. The amount of TPC, TF and TR (g/100ml): during storage time: (A) TPC, (B) TF and (C) TR; (●) control, (■) 2,000RPM, (▲) 4,000RPM, (x) 5,000RPM and (o) 6,000RPM.

Main compound which affect colour of CBT is TF and TR [1], originally the value of TF and TR should be high or not reduced significantly during storage time. Figure 2B showed that at 0 until 9 days of observation the results for TF content was significant higher than control and the rest of treatment ($p < 0.05$).

It was similar with TPC result, lower speed of centrifugation could increase the value of chemical compound but TC formation was formed faster than higher speed. Correlated with the response of treatment, control and treatment 2,000 and 4,000 RPM value is decrease significantly start from first day. Otherwise the value of response treatment 5,000 and 6,000 RPM is decrease significantly start from the second day. Figure 2C showed that the last component which affected colour characteristic was TR. Results from statistic show that control and treatment 2,000 RPM were significant different compared with 4,000; 5,000 and 6,000 RPM ($p < 0.05$). The value was higher when it compared each other. The content of TR in untreated CBT was significantly reduced start from the second day of observation, hence for all of treatment samples were significantly reduced start from the first day. Figure 2 showed that TPC, TF and TR had a negative trend, it was caused by natural degenerative of TPC during storage, and for TF and TR value would be decreased along with tea cream percentage increase.

3.1.2 Caffeine, total catechin content, gallated catechin and ungallated catechin

Figure 3 showed that CF, TCC, GaC and uGaC determination were conducted due to see the effect of these compounds with TC formation. How many deflection among control with the treated samples. Figure 3 showed that the analysis in all chemical component were classified into initial day, day 1, 2, 3, 9 and 21. The graph was expressed by relative value, the value in initial day was showed as 1. Statistical analysis was used to classify the difference among days and treatment. Significance of the variability in the responses was determined, for each of the selected effects, using univariate and Duncan test for the advance analysis.

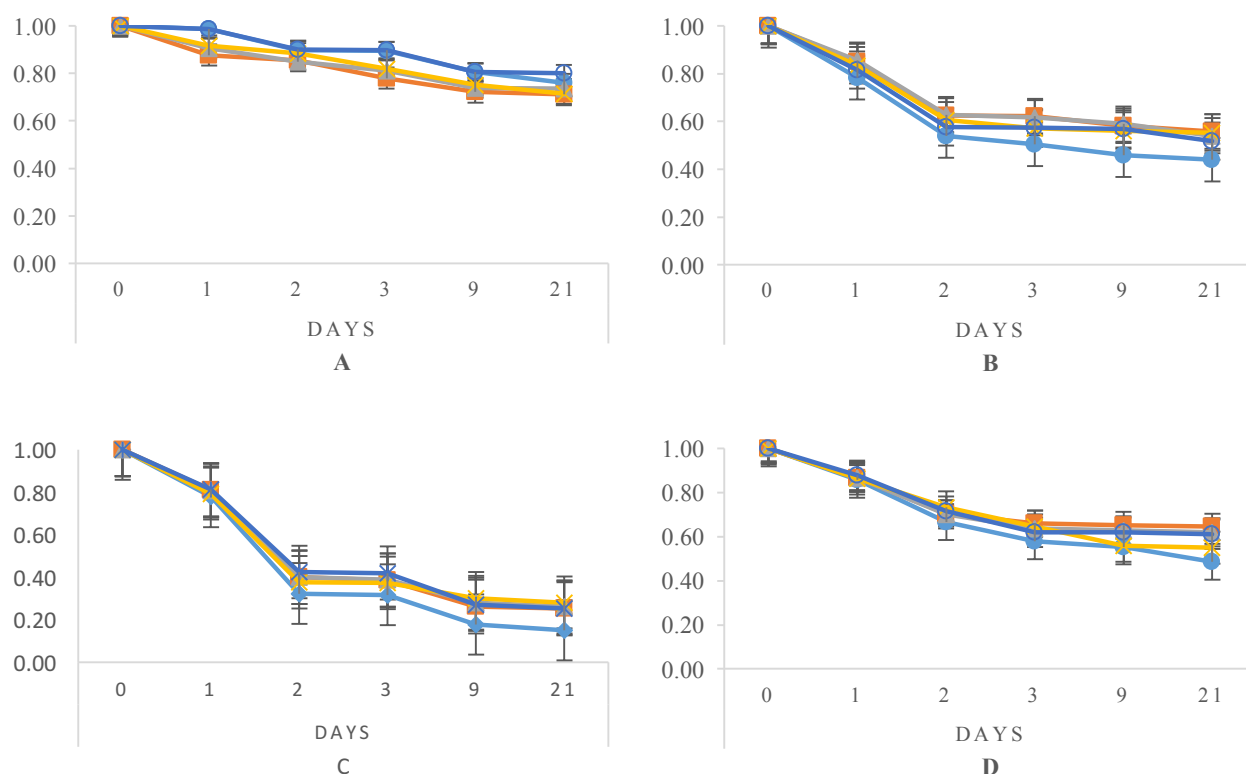


Figure 3. Chemical parameter changes during storage time: (A) CF, (B) TCC, (C) GaC and (D) uGaC; (●) control, (■) 2,000RPM, (▲) 4,000RPM, (x) 5,000RPM and (o) 6,000RPM.

Table 1. Caffeine, total catechin content, gallated catechin and ungallated catechin content during storage

| Parameter | Level | Days | | | | | |
|----------------|---------|--------------------------|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | 0 | 1 | 2 | 3 | 9 | 21 |
| CF (g/100ml) | Control | 21.14±0.1 ^{Ba} | 20.86±2.0 ^{Ba} | 19.0±0.4 ^{Bb} | 18.92±0.7 ^{Bb} | 17.04±0.6 ^{Ac} | 16.07±1.1 ^{Ac} |
| | 2k | 24.42 ±1.0 ^{Aa} | 21.41±0.5 ^{Ab} | 20.89±0.1 ^{Ab} | 19.05±0.1 ^{Bb} | 17.64±0.1 ^{Ac} | 17.37±1.1 ^{Ac} |
| | 4k | 23.42 ±1.0 ^{Aa} | 21.21±0.1 ^{Ab} | 19.89±0.2 ^{Ab} | 19.02±0.0 ^{Bb} | 17.30±0.1 ^{Ac} | 17.22±1.1 ^{Ac} |
| | 5k | 22.54 ±1.0 ^{Aa} | 20.63±0.2 ^{Bb} | 19.92±0.2 ^{Ab} | 18.47±0.2 ^{Bb} | 16.98±0.2 ^{Ac} | 16.10±1.2 ^{Ac} |
| | 6k | 21.74±0.5 ^{Ba} | 21.46 ±1.1 ^{Ba} | 19.60±1.5 ^{Bb} | 19.52±0.6 ^{Ab} | 17.51±0.3 ^{Ac} | 17.42±1.1 ^{Ac} |
| | Control | 23.52±2.3 ^{Bb} | 18.44±2.5 ^{Bb} | 12.69±2.5 ^{Bc} | 11.85±1.3 ^{Bc} | 10.82±2.8 ^{Bc} | 10.33±1.8 ^{Bc} |
| TCC (g/100ml) | 2k | 25.59±2.5 ^{Aa} | 21.78±1.9 ^{Ab} | 15.99±1.8 ^{Ac} | 15.95±3.2 ^{Ac} | 14.87±1.4 ^{Bc} | 14.27±2.8 ^{Ac} |
| | 4k | 25.14±0.9 ^{Aa} | 21.52±2.3 ^{Ab} | 15.81±4.1 ^{Ac} | 15.48±2.5 ^{Ac} | 14.81±1.2 ^{Bc} | 13.58±1.9 ^{Ac} |
| | 5k | 27.07±1.8 ^{Aa} | 22.60±0.9 ^{Ab} | 16.41±1.4 ^{Ac} | 15.44±2.5 ^{Ac} | 15.19±3.2 ^{Ac} | 14.97±3.2 ^{Ac} |
| | 6k | 27.36±2.8 ^{Aa} | 22.29±2.8 ^{Ab} | 15.78±2.3 ^{Ac} | 15.70±1.2 ^{Bc} | 15.56±1.9 ^{Ac} | 14.18±2.5 ^{Ac} |
| | Control | 8.52±0.4 ^{Ba} | 6.63±0.3 ^{Ba} | 2.76±0.8 ^{Bb} | 2.71±0.3 ^{Bb} | 1.52±0.7 ^{Bb} | 1.29±0.5 ^{Bb} |
| | 2k | 9.49±0.4 ^{Aa} | 7.69±0.4 ^{Aa} | 3.81±0.4 ^{Ab} | 3.66±0.3 ^{Ab} | 2.49±0.9 ^{Ab} | 2.42±0.4 ^{Ab} |
| GaC (g/100ml) | 4k | 9.47±0.3 ^{Aa} | 7.64±0.7 ^{Aa} | 3.79±0.5 ^{Ab} | 3.67±0.7 ^{Ab} | 2.65±0.9 ^{Ab} | 2.48±0.3 ^{Ab} |
| | 5k | 9.53±0.5 ^{Aa} | 7.56±0.8 ^{Aa} | 3.58±0.9 ^{Ab} | 3.57±0.2 ^{Ab} | 2.87±0.4 ^{Ab} | 2.68±0.9 ^{Ab} |
| | 6k | 10.02±0.7 ^{Aa} | 8.13±0.3 ^{Aa} | 4.26±0.3 ^{Ab} | 4.20±0.3 ^{Ab} | 2.73±0.9 ^{Ab} | 2.54±0.9 ^{Ab} |
| | Control | 10.37±1.2 ^{Ba} | 8.88±0.5 ^{Ba} | 6.90±0.3 ^{Bb} | 5.99±0.3 ^{Bb} | 5.74±0.2 ^{Bb} | 5.04±0.7 ^{Bb} |
| | 2k | 11.96±0.5 ^{Aa} | 10.36±1.2 ^{Aa} | 8.42±0.7 ^{Ab} | 7.89±1.1 ^{Ab} | 7.79±0.5 ^{Ab} | 7.71±0.5 ^{Ab} |
| | 4k | 11.94±0.3 ^{Aa} | 10.35±1.2 ^{Aa} | 8.37±0.4 ^{Ab} | 7.61±1.1 ^{Ab} | 7.52±0.3 ^{Ab} | 7.39±0.9 ^{Ab} |
| uGaC (g/100ml) | 5k | 12.95±0.3 ^{Aa} | 11.16±0.3 ^{Aa} | 9.49±0.8 ^{Ab} | 8.35±1.1 ^{Ab} | 7.25±0.4 ^{Ab} | 7.13±0.3 ^{Ab} |
| | 6k | 12.17±0.4 ^{Aa} | 10.68±1.1 ^{Aa} | 8.70±0.7 ^{Ab} | 7.54±1.2 ^{Ab} | 7.54±0.7 ^{Ab} | 7.42±1.1 ^{Ab} |

Each value is the mean of two independent measurements.

Values in the same column with the different superscript lowercase letters are statistically different ($p < 0.05$).

Values in the same row with the different superscript uppercase letters are statistically different ($p < 0.05$).

Control means untreated sample; 2k means speed of centrifugation is 2,000RPM; 4k means speed of centrifugation is 4,000RPM; 5k means speed of centrifugation is 5,000RPM; and 6k means speed of centrifugation is 6,000RPM.

Figure 3A showed that CF content in control and 6,000 RPM at initial day until second day was significant different with treated sample 2,000; 4,000 and 5,000 RPM ($p < 0.05$). The value in control and 6,000 RPM treatment was lower than other treated sample, that mean centrifugation could reduce CF loss in CBT, but if the speed of centrifugation reached 6,000 RPM the content loss will be same with control. It was due to the CF compound inside was separated during centrifugation, although the value of TC was lower than control but the content inside was already separated from the beginning. CF content in control response and 6,000 RPM treatment is decreased significantly start from the second day, compared with the other treated sample it was started from the first day ($p < 0.05$). In day 9 and 21 of observation the value of CF content was not different among control and all treated samples. It showed that the CF content will be decreased steadily and reached the equilibrium state along with TC formation.

Figure 3B, 3C and 3D showed TCC, GaC, uGaC results were separated. It was due to classified the group of C which had effect to TC formation. that another compound like TCC content in control is significant different with treated sample ($p < 0.05$). Figure 3B showed that the value of TCC in the control sample at all days of observation was lower than the treated samples. The result proved that centrifugation could reduce TCC loss in CBT during observation. TCC in control and treated samples were decrease significantly start from initial day until second day, after that the slope of graph was reduced until steady. That showed that TCC would decreased significantly until equilibrium state reached. TCC in control response was decreased significantly, starting from the second day to 14 days, compared with the treated sample starting from the first day to 14 days ($p < 0.05$).

C group was divided into GaC and uGaC based on chemical structures. It has been reported that GaC played an important role in the TC formation [13]. Figure 3C showed that, GaC had similar result with TCC [5], the content in control at initial day until the last day of observation was significant different with treated sample ($p < 0.05$). The value was lower than treated sample, it means GaC might participate in the TC formation, resulting lower content in the clear fraction. The value of untreated CBT was lower than treated sample, it means centrifugation also can reduce GaC participating in TC which cause the loss in CBT. Value of GaC in control and untreated was decreased significantly until the second day, after that decreased steadily as found in TCC. It showed that GaC was a component involving in TC based on the similarity as found for CF and TCC. However, GaC could be the

important compound due to the trend of reduction was higher and sharper than CF and TCC.

To prove the statement mentioned above, uGaC the last C group was determined. Figure 3D showed that the uGaC decreased during storage. this result was similar to the results of CF, TCC and GaC. Value of uGaC in control was significant difference when compared to treated sample ($p < 0.05$). The content of uGaC in the untreated samples was lower than treated samples. It indicated that centrifugation also can reduce uGaC participating in TC which cause the loss in CBT. Table 1 showed that the reduction value of GaC was higher than uGaC. It showed that GaC might be the important component to participating in TC during storage.

3.2 Physical

3.2.1 Turbidity

Physical parameter in this research was turbidity, turbidity was one of main quality parameter of CBT or RTD tea. The value of turbidity naturally increased naturally during storage time, especially if stored in cold environment.

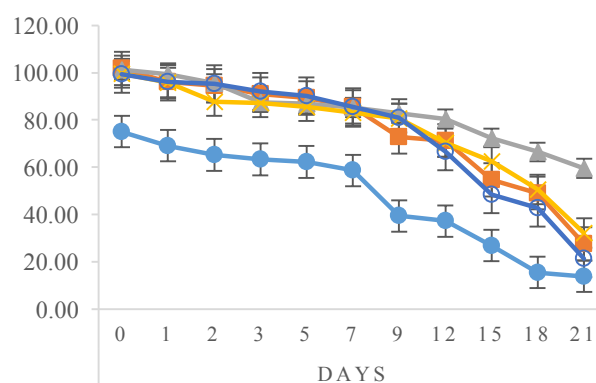


Figure 4. Turbidity values changes during storage time: (●) control, (■) 2,000RPM, (▲) 4,000RPM, (x) 5,000RPM and (o) 6,000RPM.

Figure 4 showed that the control value of turbidity at all days of observation was lower compared than other treated samples. Based on statistical analysis the results from control response was significant different with all treatment samples ($p < 0.05$). In the last day of observation (day 21), the value of turbidity in treated samples was not significant different with control. Trend of turbidity values in this research was decrease steadily, it had opposite effect with normal black tea. Because during storage time, TC was formed. TC would attracted many components inside and precipitation will be occurred, the result was turbidity will decreased along observation days (Figure 4).

3.2.2 Tea cream

TC was the main component which being main factor of this research. Value of TC was affected by CF, TPC, TCC, GaC, uGaC, TF and TR [12]. From previous figure and table, it was already explained for the correlation among component along with the response and control. TC formation would trigger the characteristic changed like turbidity of CBT would be altered.

Table 2 showed the value of control at initial day until 18 days was significant different ($p < 0.05$) with other treatment. At the last day of observation the value of TC for all treated sample was not significant different with control, it means the TC will increased during storage time and reach the same value with

control at 21 days. Control at initial day and first day had around 22 percent TC, for treated sample the value only around 3 percent TC. Treated sample need 21 days of storage time to reached the same value with control. It showed that centrifugation can be used effectively to reduce TC formation occurred. TC content at centrifugation speed 2,000 RPM increased faster than other treated sample. Started from second days, for 2,000 RPM treated sample, the TC percentage higher than other treated sample. From graph the trend of percentage of TC for all treated response was increased, compared with control which stable in high value.

Table 2. Tea cream percentage changes during storage time

| Parameter | Level | Days | | | | | | | | | | |
|-------------|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | 0 | 1 | 2 | 3 | 5 | 7 | 9 | 12 | 15 | 18 | 21 |
| % Tea cream | Control | 21.5±4 ^{Aa} | 22.0±4 ^{Aa} | 21.5±4 ^{Aa} | 22.0±5 ^{Aa} | 22.5±4 ^{Aa} | 22.5±4 ^{Aa} | 22.5±4 ^{Aa} | 22.5±5 ^{Aa} | 22.5±5 ^{Aa} | 23.0±4 ^{Aa} | 23.0±4 ^{Aa} |
| | 2k | 3.0±0 ^{Bf} | 6.6±0 ^{Be} | 7.1±2 ^{Be} | 9.2±1 ^{Bd} | 9.3±1 ^{Bd} | 11.1±1 ^{Bc} | 12.1±2 ^{Bc} | 14.1±1 ^{Bc} | 16.6±2 ^{Bb} | 20.2±1 ^{Bb} | 23.1±1 ^{Aa} |
| | 4k | 3.0±0 ^{Bf} | 6.6±1 ^{Be} | 6.1±1 ^{Be} | 8.2±2 ^{Bd} | 8.3±2 ^{Bd} | 10.1±1 ^{Bc} | 12.1±2 ^{Bc} | 14.1±1 ^{Bc} | 16.6±2 ^{Bb} | 19.2±1 ^{Bb} | 22.1±1 ^{Aa} |
| | 5k | 3.0±0 ^{Bf} | 6.6±2 ^{Be} | 6.1±1 ^{Be} | 8.2±1 ^{Bd} | 8.3±1 ^{Bd} | 10.1±2 ^{Bc} | 12.1±2 ^{Bc} | 14.1±1 ^{Bc} | 16.6±2 ^{Bb} | 19.2±1 ^{Bb} | 22.1±1 ^{Aa} |
| | 6k | 3.0±1 ^{Bf} | 5.6±1 ^{Be} | 5.1±2 ^{Be} | 7.2±1 ^{Bd} | 8.3±1 ^{Bd} | 10.1±2 ^{Bc} | 11.1±2 ^{Bc} | 14.1±1 ^{Bc} | 16.6±1 ^{Bb} | 19.2±1 ^{Bb} | 21.1±1 ^{Aa} |

Each value is the mean of two independent measurements.

Values in the same column with the different superscript lowercase letters are statistically different ($p < 0.05$).

Values in the same row with the different superscript uppercase letters are statistically different ($p < 0.05$).

Control means untreated sample; 2k means speed of centrifugation is 2,000RPM; 4k means speed of centrifugation is 4,000RPM; 5k means speed of centrifugation is 5,000RPM; and 6k means speed of centrifugation is 6,000RPM.

IV. CONCLUSIONS

This research indicates that centrifugation can be effectively applied to reduce the tea cream formation in concentrated black tea. The effective centrifuge speed was at least 4,000 RPM for 20 minutes. This treatment provides the stable concentrated black tea as long as 21 days of storage at room temperature (25°C). During storage CF, TPC, TCC, GaC, uGaC, TF, TR and turbidity decrease. This treatment can be applied to CBT manufacturer in order to solve the tea cream problem before distribution to RTD industry, providing the reduction of economic loss due to TC.

V. ACKNOWLEDGEMENTS

The authors would like to thank Mae Fah Luang University for the funding and all of staff from Tea Institute Mae Fah Luang University.

VI. REFERENCES

- [1]. Aguilar, C. N., Rodriguez, R., Gutierrez-Sanchez, G., Augur, C., and Favela-Torres, E., 2007.
- [2]. Microbial tannases: Advances and perspectives. *Applied Microbiology and Biotechnology*, v. 76, 47-59.
- [3]. Aguilar PS, et al. 2007. The Plasma Membrane Proteins Prm1 and Fig1 Ascertain Fidelity of Membrane Fusion during Yeast Mating. *Mol Biol Cell*18(2):547-56

- [4]. Aoshima, H.; Ayabe, S. 2007. Prevention of the deterioration of polyphenol-rich beverages. *Food Chem.* 100, 350-355.
- [5]. Arnas, Y. 2009. Pengaruh Pemberian Seduhan Teh Hitam (*Camellia sinensis*) dengan Dosis Bertingkat Terhadap Proliferasi Limfosit Mencit BALB/c yang Diinokulasi *Salmonella typhimurium* (skripsi). Semarang: Fakultas Kedokteran Universitas Diponegoro Semarang.
- [6]. Ashok Praveen Kumar dan Upadhyaya Kumud. 2012. Tannins are astringent. *Journal of Pharmacognosy and Phytochemistry* Vol.1 Issue 3
- [7]. Asil, Rabiei dan Ansari. 2012. Optimal fermentation time and temperature to improve biochemical composition and characteristic of black tea. *Australian journal of crop science*
- [8]. Chaturvedula Ventaka Sai Prakash dan Prakash Indra. 2011. The aroma, taste, color and bioactive constituents of tea. *Journal of Medicinal Plants Research* Vol. 5(11). Halaman 2110-2124
- [9]. Ishizu, T., Kajitani, S., Tsutsumi, H., Sato, T., Yamamoto, H. and Hirata, C. (2011) Configurational Studies of Complexes of Tea Catechins with Caffeine and Various Cyclodextrins. *Planta Medica* 77, 1099-1109.
- [10]. Kim, Y., & Talcott, S. T. (2012). Tea creaming in nonfermented teas from *Camellia sinensis* and *Ilex vomitoria*. *Journal of Agricultural and Food Chemistry*, 60(47), 11793–11799.
- [11]. Lin, X., Chen, Z., Zhang, Y., Gao, X., Luo, W., & Li, B. (2014). Interactions among chemical components of Cocoa tea (*Camellia ptilophylla* Chang), a naturally low caffeine-containing tea species. *Food & Function*, 5(6), 1175–1185.
- [12]. Mahmood, T., Akhtar, N., & Khan, B. 2010. The morphology, characteristics and medicinal properties of 'Camellia sinensis' tea. *Journal of Medicinal Plant Research*, 2028-2033.
- [13]. Vuong, Q.V., Golding, J.B., Nguyen, M. and Roach, P.D. 2010 Extraction and isolation of catechins from tea. *Journal of Separation Science* 33, 3415-3428.
- [14]. Vuong, Q.V., Stathopoulos, C.E., Nguyen, M.H., Golding, J.B. and Roach, P.D. 2011 Isolation of Green Tea Catechins and Their Utilization in the Food Industry. *Food Reviews International* 27, 227-247.
- [15]. Wan, X., Li, D., & Zhang, Z. 2008. Antioxidant properties and mechanism of tea polyphenols. In C.-T. Ho, J.-K. Lin, & F. Shahidi (Eds.), *Tea and tea products: Chemistry and health-promoting properties* (pp. 141). CRC Press: London.
- [16]. Xu, Y. Q., Chen, G. S., Du, Q. Z., Que, F., Yuan, H. B., & Yin, J. F. (2014). Sediments in concentrated green tea during low-temperature storage. *Food Chemistry*, 149(15), 137–143.
- [17]. Xu, Y., Chen, S., Shen, D., & Yin, J. (2011). Effects of Chemical components on the amount of green tea cream. *Agricultural Sciences in China*, 10(6), 969-974.
- [18]. Xu, Y., Chen, S., Yuan, H., Tang, P., & Yin, J. (2012). Analysis of cream formation in green tea concentrates with different solid concentrations. *Journal of Food Science and Technology*, 49(3), 362-367.
- [19]. Xu, Y., Hu, X., Tang, P., Jiang, Y., Yuan, H., Du, Q., & Yin, J. (2015). The major factors influencing the formation of sediments in reconstituted green tea infusion. *Food Chemistry*, 172, 831-835.
- [20]. Xu, Y. Q., Zhong, X. Y., Yin, J. F., Yuan, H. B., Tang, P., & Du, Q. Z. (2013). The impact of Ca²⁺ combination with organic acids on green tea infusions. *Food Chemistry*, 139, 944-948.
- [21]. Yin, J., Xu, Y., Yuan, H., Luo, L., & Qian, X. (2009). Cream formation and main chemical components of green tea infusions processed

The Synthesis of Activated Carbon Based Waste Mangrove Propagule Using Microwave Radiation and its Application to Adsorb Pb and Zn on Electroplating Industrial Waste

¹Nailu Sa'ada Turrohmah, ²Roni Putera Marda and ³Widi Astuti

^{1,2,3}Department of Chemical Engineering Semarang State University Semarang, Indonesia

¹nailusaada@gmail.com

²mardaronny@gmail.com

³wiwid.unnes@mail.ac.id

ABSTRACT

Activated carbon based waste mangrove propagule was prepared by KOH activation using microwave radiation. The adsorption performance in terms of uptake along with its dependence on heating techniques has been studied for Pb and Zn on activated carbons of propagule mangrove. The effects of most significant preparation variables on pore structure of activated carbon and adsorption performance were also presented. The combined effects of pH, contact time and initial concentration. The results show that activated carbon prepared by microwave heating technique has larger pore structure and higher adsorption capacity for Pb and Zn, pH 4, contact time 40 minutes and initial concentration 40 ppm were optimum condition to adsorb Pb and Zn. Activated carbon based waste mangrove propagule as a natural, abundant and low-cost adsorbent, might be a suitable local alternative for eliminate Pb and Zn on electroplating industrial waste.

Keywords : Activated carbon; Adsorption; Mangrove Propagule; Microwave; Pb-Zn

I. INTRODUCTION

Increasing population growth and development in line with the increase in water supply for various purposes. Meanwhile, the clean water supply is now a fairly serious problem with the increasing water pollution by heavy metals. The high content of heavy metals cause the disruption of marine ecosystems and the emergence of various diseases because most of the heavy metals are toxic. One of the main ingredients that can cause water pollution is industrial waste [1]. One method to eliminate heavy metals in the wastewater is adsorption [2]. Adsorbent used is a mangrove propagules waste as activated carbon, which is activated potassium hydroxide (KOH) to develop activated carbon porosity. Of the many chemical agents KOH has been preferred recently environmental and economic concern.

Object of this study is the application of mangrove propagule based activated carbons by conventional and microwave induced KOH activations. Mangrove propagule waste is an ideal raw material for preparing activated carbon due to its lignocellulosic content, easy renewal, great availability and low price [2]. Mangrove propagule application that will be used to remove Pb-Zn from aqueous solution. The influence of microwave and conventional method was investigated.

II. METHOD

Mangrove propagules were washed, then cut to the reviews get results the small more on dried and then dried until 105°C temperature, from the seeds of mangrove propagules adsorbent are sieved using 120 mesh. Carbonization is done by heating in a furnace for 2 hours at 700°C until becoming charcoal mangrove propagules. Mangrove propagules produced charcoal mixed with potassium hydroxide (KOH) at ratio of 1:1 (m/m%). The mixture was microwave and conventional method. In the conventional method the mixture was placed into a reactor mounted on a microwave ceramic with an input power of 600 watts and a frequency of 2,45 GHz for 12 minutes, drained N₂ gas. The results obtained were washed with 0,1N HCl to pH neutral and then dried in an oven at a temperature of 105°C.

Adsorption is done by directly contacting the adsorbent with adsorbate in a batch adsorption. Mangrove propagule 0,5 gram was mixed with 50 mL of ion Pb-Zn at pH 4, the contact time of 240 minutes and the initial concentration of 100 ppm solution. The suspended solids were filtered and the filtrate was analyzed for residual Pb-Zn using atomic adsorption spectrophotometer (AAS).

III. RESULT AND DISCUSS

A. Activated carbon character of mangrove propagule

The surface chemistry of Activated Carbon of Mangrove Propagules was studied by FTIR spectroscopy from the infrared spectral region of 4000-450 cm^{-1} as presented in Fig.1 Shows the peaks of the wave numbers on the IR spectrum of the mangrove propagule before the accumulation of 3830.1 cm^{-1} , 3811,24 cm^{-1} , 3790,18 cm^{-1} , 3699,18 cm^{-1} , 3660,86 cm^{-1} , 3435.4 cm^{-1} , 1559.29 cm^{-1} , 1457.01 cm^{-1} and 874.79 cm^{-1} . In the absorption bands 3830.1 cm^{-1} to 3435.4 cm^{-1} indicate the presence of OH octahedral, carboxylic acid (RCOOH) and alcohol (ROH) vibrations [3, 4, 5]. C-C and C-O vibrations which are carboxylic groups are shown successively in absorption bands 1559.29 cm^{-1} and 1457.01 cm^{-1} . While the absorption band 874,79 cm^{-1} indicates the presence of a group containing C-H vibrations or including methylene groups [5].

While the peaks of wave numbers in the mangrove propagule charcoal after activation are 3782,65 cm^{-1} , 3701,33 cm^{-1} , 3426,21 cm^{-1} , and 1555,97 cm^{-1} . The presence of an O-H vibration which is a hydroxyl group is shown in absorption bands 3782.65 cm^{-1} , 3701.33 cm^{-1} and 3426,21 cm^{-1} . While in the absorption band 1555,97 cm^{-1} indicates the presence of C=O which is a ketone [6].

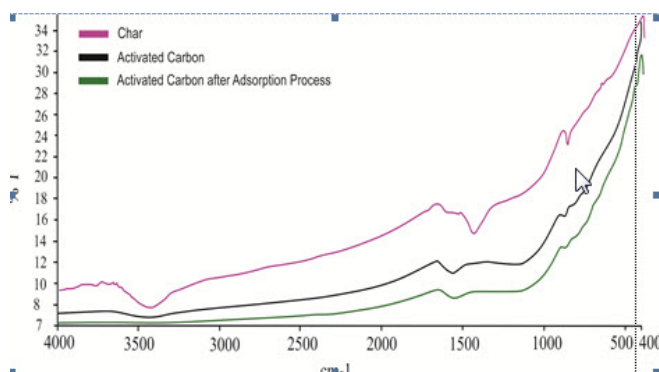


Figure 8. Spectra IR char of mangrove propagule before and after activation.

B. Effect of Heating Technique

The heated techniques studied were activated carbon without activation (CAT), conventional heated activated carbon (CAK) and microwave activated carbon (CAM). Fig. 2 shows the adsorbate Pb-Zn is 100% perfectly adsorbed.

Heating techniques during activation also affect the physical and chemical characteristics of the activated carbon structure. In conventional heating, the

heat source lies outside the carbon and energy transfer to the sample from the inward surface through convection, conduction mechanism, and radiation. Therefore, a thermal gradient of hot surface of activated carbon is formed. To avoid this thermal gradient, the heating rate is lowered thus increasing the duration of the activation process resulting in greater energy consumption. Thermal gradients inhibit the release of pyrolysis gas into the environment, therefore, some volatile components may remain in the sample, resulting in uniform heat [7]. As a result, the quality of activated carbon is poor so that the application of Pb-Zn adsorption percentage decreases slightly.

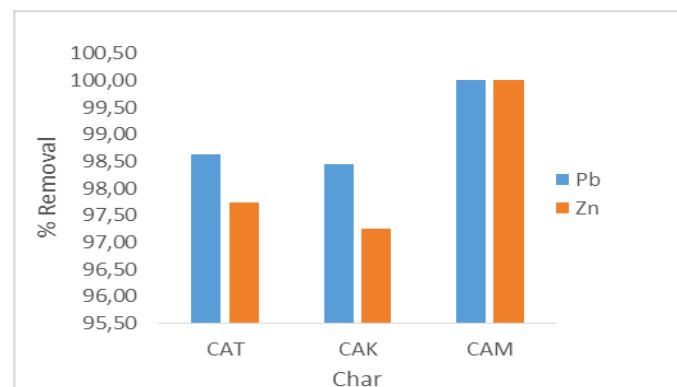


Figure 9. Effect of heating technique to removal Pb and Zn.

C. Effect of pH solution

The effect of pH of the solution on Pb-Zn adsorption was studied on pH 2, 4, 6, 8 and 10 variations as shown in Fig. 3. The effect of pH causes the charge changes on adsorbent and adsorbate which will further affect the electrostatic interaction between activated carbon and Pb and Zn ions. Figure 4.4 shows that at pH 4 adsorbate is perfectly absorbed by 100% percentage. Activated carbon tends to be protonated at low pH so that active sites tend to be positively charged [5]. This causes a repulsion between the active site and the Pb and Zn ions which are also positively charged so that adsorption is difficult to occur, whereas at pH 6 has formed $\text{Pb}(\text{OH})^+$ with a larger molecular size, thereby inhibiting the adsorption of Pb as well as on Zn, the higher the pH the $\text{Zn}(\text{OH})^+$ begins to form, thus decreasing the amount of Zn absorbed [2].

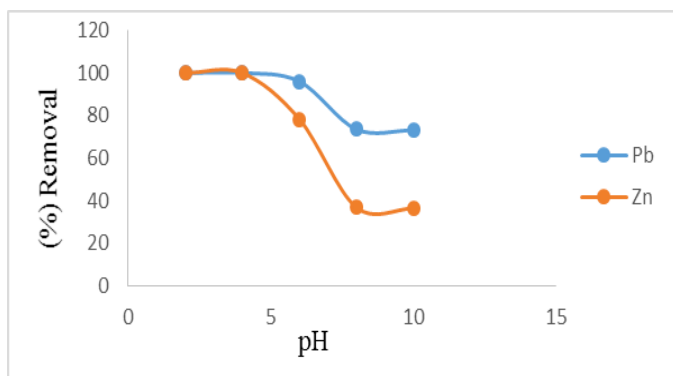


Figure 10. Effect of pH solution to removal Pb and Zn.

D. Effect of contact time

The effect of time on the decrease of Pb (II) -Zn (II) was studied with variations of time 0, 10, 20, 30, 40, 50, 60, 120 and 180 min presented in Fig. 3 shows when the contact time of 0 to 10 minutes decreases Pb and Zn has a rapid increase and Pb decreases tend to be constant at 20 to 180 minutes. This is because there are still many active sites that are empty, so it is still high enough to absorb the solution [8]. The longer the contact time, the more Pb-Zn is absorbed by the active site until it reaches the saturation point and there is a balance.

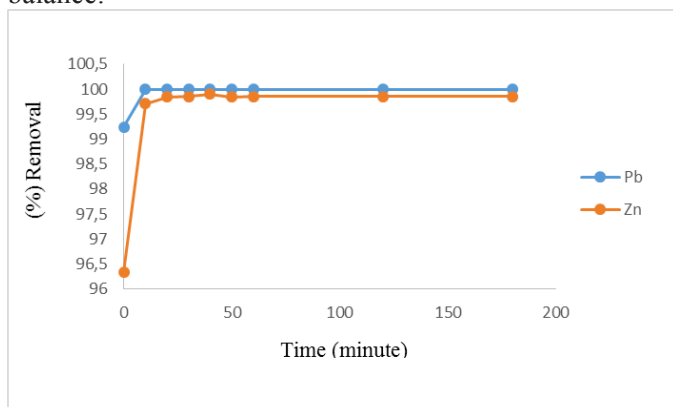


Figure 11. Effect of contact time to removal Pb and Zn.

E. Effect of concentration

The effect of the initial concentration of the solution on the decrease of Pb-Zn was studied through concentration variations of 10, 20, 30, 40, 50, 100, 200, 300, 400 and 500 ppm. Fig. 5 shows the effect of the initial concentration of the solution on the decrease of Pb-Zn which indicates the higher the concentration, the higher Pb is absorbed. This is because the higher the concentration of adsorbate, the force of the driving force is also greater so that the movement of the adsorbate molecule causing the mass transfer rate (surface diffusion) from the solute phase (adsorbate) to the faster adsorbent [9]. However, in Zn adsorption the opposite occurs, the higher the initial concentration of the solution the decreasing the Zn will be absorbed.

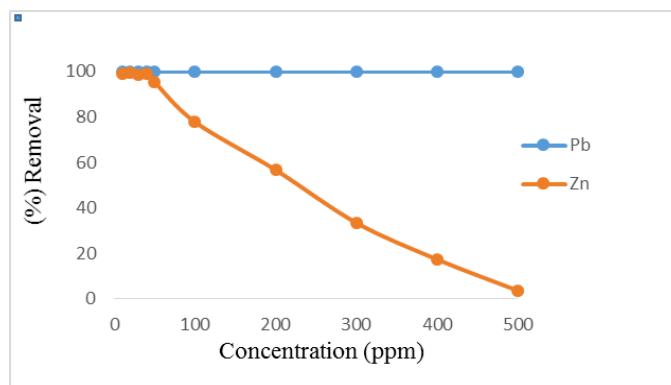


Figure 5. Effect of concentration to removal Pb and Zn.

This is due to the increasing number of competing ions to bind and the lack of active sites on the adsorbent at higher concentrations. Therefore, many metal ions are left unabsorbed in solution at higher concentration levels [10]. In addition, at low concentrations of metals adsorbed by certain sites, meanwhile with increasing concentrations of metals, the specified sites are already saturated and exchange sites are filled to produce less droplets of metals adsorbed [11].

IV. CONCLUSION

Activated carbon based mangrove propagule using microwave radiation showed the greatest removal 100% Pb and Zn at optimum condition pH 4, contact time 40 minutes and concentration of solution 40 ppm. It is recommended to remove Pb and Zn on electroplating industrial waste.

Acknowledgment

The authors are grateful for support from Kementrian Riset dan Teknologi (KEMENRISTEK DIKTI). This project was also supported by Semarang State University and Department of Chemical Engineering Semarang State University.

References

- [1] Jang-Sook, K., Seong-Taek, Y. Jong-Hwa, L., Soon-Oh, K., and Ho-Young, J., "Removal of divalent heavy metals (Cd, Cu, Pb, Zn) and Arsenic (III) from aqueous solution using scoria: kinetics and equilibria of sorption," *Journal of Hazardous Material*, vol. 174, pp. 307–313, 2010.
- [2] Duan, S., Tang, R., Xue, Z. X. Z., Zhao Y., Zhang, W., Zhang, J., Wang, B., Zeng, S., Sun, D., "Effective removal of Pb(II) using magnetic $\text{Co}_0.6\text{Fe}_{2.4}\text{O}_4$ micro-particles as the adsorbent: Synthesis and study on the kinetics and

- thermodynamic behaviors for its adsorption, "Colloid and Surface A: Physicochem. Eng. Aspects., 2015.
- [3] Yorgun, "Fine particles, thin films and exchange anisotropy," in *Magnetism*, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
- [4] Shamsuddina, M.S., Yusoffa, N.R.N., and M.A.Sulaimana, "Synthesis and characterization of activated carbon produced from kenaf core fiber using H₃PO₄ activation, *Procedia Chemistry*, vol. 19, pp. 558–565, 2016.
- [5] Astuti, W., Hermawan, R.A., Mukti, H., and Sugiyono, N.R., "Preparation of activated carbon from mangrove propagule waste by H₃PO₄ ACTIVATION FOR Pb²⁺ adsorption" AIP Conference. Proc., vol. 1788, pp. 030082-1—030082-5, 2017.
- [6] Heidari, Ava., Younesi, Habibollah., Rashid, Alimerad and Ghoreyshi, Ali Asghar, "Evaluation of CO₂ adsorption with eucalyptus wood based activated carbon modified by ammonia solution through heat treatment," *Chemical Engineering Journal*, vol. 254, pp. 503–513, 2014.
- [7] Ahmed, Muthana J., "Application of agricultural based activate carbons by microwave and conventional activation for basic dye adsorption: Review", *Journal of Environmental Chemical Engineering*, 2015.
- [8] Owamah, H.I., "Biosorptive removal of Pb(II) and Cu(II) from wastewater using activated carbon from cassava peels", *Journal Material Cycle Waste Management*, 2013.
- [9] Zhou, Weihua., Bai, Hangjuan., Goo, Shuaipeng and Li, Ke, "Characterization of modified sawdust, kinetic and equilibrium study about methylene blue adsorption in batch mode", *Korean Journal Chemical Engineering*, vol. 30 (1), pp. 111-122, 2013.
- [10] Abdel Ghani, N.T., M, Henfy and El-Chaghaby, "Removal of lead from aqueous solution using low cost abundantly available adsorbents", *Journal Environmental Science Technology*, vol. 4, pp. 67, 2007.
- [11] Karnib, Mona, Kabbani, Ahmad, Holaila, Hanafy, and Olama, Zakia, "Heavy Metals Removal Using Activated Carbon, Silica and Silica Activated Carbon Composite", *Energy Procedia*, vol. 50, pp. 113 – 120, 2014.

Optimizing Thermal Cracking Polystyrene : Waste Plastic to Produce Liquid Fuel – A Review

Oci Oktarini, Adi Agustiansyah, Muhammad Ariq Perdana, Muhamad Fadil Taufik

Chemical Engineering Department, State Polytechnic of Sriwijaya

Palembang, Indonesia

Oktarinioci@gmail.com, Adiagustiansyah@gmail.com, Ariq_Perdana@yahoo.com, Muhfadiltaufik@gmail.com

ABSTRACT

Waste plastics contribute to great environmental and social problems due to the loss of natural resources, environmental pollution, depletion of landfill space on the one hand and demands of environmentally-oriented society on the other hand. Indonesia produces waste plastics about 5.4 million ton per year. However, waste plastics can become a source of enormous energy with the correct treatment. That is by making alternative energy from altering waste of plastic polyethylene (Low Density Polyethylene) become liquid fuel by pyrolyzing. This research aims to design pyrolysis reactor, develop pyrolysis operating procedure, and to investigate the effect of pyrolysis temperature to liquid product quality. The pyrolysis experiments will be performed in batch reactor equipped from stainless steel with 15 cm inside diameter and 50 cm height. The experimental conditions are as follows: temperature range 400-600°C, and reaction time 0-120 min. The results showed that the product is a liquid fuel that is highest at a temperature of 300°C. Based on the analysis of thermal cracking products of polystyrene that turned out to be a liquid fuel produced 3 components of 70% volume of gasoline, 20% volume of kerosene, and 10% volume diesel (diesel).

Keywords : waste; plastics; fuel

I. INTRODUCTION

The needs of fuels are increasing steadily and almost all of them are derived from fossil energy. The impact of global climate change caused by the use of fossil energy as fuel becomes a big issue. Global climate change caused by the accumulation of carbon dioxide (CO₂) as a result of burning fossil fuels has been felt by all the inhabitants. In addition, since plastics are synthesized from non-renewable sources and are generally not biodegradable, waste plastics are the cause of many of the serious environmental problems the world today.

Waste plastics contribute to great environmental and social problems due to the loss of natural resources, environmental pollution, depletion of landfill space on the one hand and demands of environmentally-oriented society on the other hand. Indonesia produces waste plastics about 5.4 million ton per year. The garbage wastes most plastics are not readily biodegradable and will remain in the landfill for indeterminate periods.

The ever increasing costs of landfill disposal coupled with a significant public resistance to the creation of new waste landfill has led to increased efforts toward finding economically feasible and environmentally acceptable means of recycling these materials. At present, it is almost impossible to dispose of waste plastics by landfill due to the law, high costs, and higher ecological consciousness of people. Land filling not only wastes the resources but also engrosses land with pollution with macromolecules of plastic that are not biodegradable, it is important to find an efficient strategy to treat them.

However, waste plastics can become a source of enormous energy (a source of fuel) with the correct treatment by means of pyrolysis. Pyrolysis means thermal decomposition of organic matter, in a vacuum or in an inert atmosphere.

The research of plastic polystyrene cracking using a reactor with heating thermal element was conducted. However the research had not reached the optimum temperature for cracking of polystyrene because the element had not function well at temperature above 300°C. That is by making alternative energy from altering waste of plastic polyethylene (Low Density Polyethylene) become liquid fuel by pyrolyzing.

II. RESULT AND DISCUSSION

a. *The impact of Using Plastic Waste as Fuels*

Plastic provides many benefits to modern life possible. They help keep fresher food for longer, reducing the weight of cars in order to reduce a little fuel, protect our homes so that we use less energy, and maintain medical supplies countless safe and sterile. While some plastics are recyclable, but the other can be a garbage after use. Plastic is made of polymer chemistry and materials will not decompose when discarded and buried. that's why plastic recycling process developed.

But many who docked in landfills or pollute the marine ecosystem. But new technologies that can utilize the fuel content in non-recycled plastics may help remedy this. This technology works as part of an integrated approach to managing waste and is aimed at creating value from waste - this approach dubbed sustainable materials management.

b. *Plastic has Intrinsic Value as a Fuel Source*

Plastics are made primarily of energy raw materials, usually natural gas or oil (mostly natural gas in the United States). Hydrocarbons are formed of plastic which is manifested in the material itself, essentially making the plastic forms of stored energy, which can be turned into a source of liquid fuel.

Ethylene and Propylene is the main ingredient of making plastic from crude oil with natural gas purification process. Ethane, propane, and various other petrochemical products generated by the purification process. Furthermore, ethane and propane divided using a high-temperature furnace, ethylene and propylene are formed from this process. plastic

polymers (substances such as starch) is formed is made by mixing the catalyst.

c. *Cracking Reactor Using Induction Heating Technology can make Optimizing Thermal Cracking Pyrolystirene*

Technology of Waste Plastic to Produce Liquid Fuel has been many found such as research of Thermal Cracking Polystyrene. This research aims by design a prototype of cracking reactor using induction heating technology and to investigate the effect of optimum pyrolysis temperature and efficiency of electrical energy consumption.

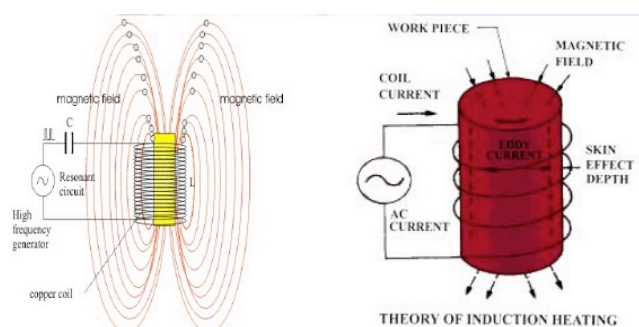


Figure 1. Induction heating reactor scheme

On that research the reactor used is a stainless steel cylindrical reactor with 3.5 inch inside diameter and 20 cm high. Induction heating is the onset of heat on the metal exposed to the induction of the magnetic field. When a metal body (reactor body) is inserted into a copper wire coil with 4 inch diameter, which is placed at the bottom of the reactor, connected to an alternating power source. Alternating magnetic flux will flow through the reactor body. This flux induces electromagnetically an eddy current in the reactor body, which creates Joule heat and raises the temperature of reactor itself. As induction heating coils are installed at the periphery of reactor body, the reactor body is heated by the induced heat directly, heats up input waste plastics very quickly, and keeps at high temperature, required for the continuation of the pyrolysis (400-500°C). It is well known that plastics in general decompose at 200-250°C primarily and at

around 350°C secondarily, generating hydrocarbons (gases and liquids). The decomposition of most polymers at 450-500°C into fuel oil and gas at oxygen free atmosphere. The temperature at certain points inside the reactor is measured by means of thermocouples. The gas is cooled in a condenser collected in a storage tank, and liquid fuel condensate is then. Thus, the components of the liquid fuel can produce more optimally component of gasoline fraction (C₅-C₁₂), kerosene fraction (C₁₁-C₁₃), solar fraction (C₁₃-C₁₇), accordance with the principle of the Directorate General of oil and gas Agreement No. 940/34/DJM.O/2002. The advantage of induction heating is precise, repeatable and temperature can be rapidly and easily controlled to increase more plastic fuel products in a shorter time. It also has high energy efficiency due to fast startup in the process causing low equipment cost and heating treatment method also having a low possibility of dioxin generations.

d. Optimizing Thermal Cracking Polystyrene can Produce Fuel

Based on purpose of previous research of Thermal Cracking Polystyrene is to design pyrolysis reactor, develop pyrolysis operating procedure, and to investigate the effect of pyrolysis temperature to liquid product quality. The pyrolysis experiments will be performed in batch reactor equipped from stainless steel with 15 cm inside diameter and 50 cm height. The experimental conditions are as follows: temperature range 400-600°C, and reaction time 0-120 min. From all variables studied, it seemed that temperature had the highest effect. The pyrolytic oil yield increase with the increase of the temperature and its composition becomes more variative and few contents of carboxylic acids and aromatics compound.

E. The Result of Thermal Cracking Polystyrene for Produce Liquid Fuel from Waste Plastic

The experimental of plastic polystyrene cracking thermal reactor before, It was not yet come up with to determine optimum temperature for plastic cracking thermal of polystyrene because there were trouble of its heater element. So that from research, suggested the existence of repair to element heater of reactor that can know influence of higher yield level temperature to liquid fuel product.

The results of Optimizing Thermal Cracking Polystyrene showed that the product is a liquid fuel

that is highest at a temperature of 300 °C. Based on the analysis of thermal cracking products of polystyrene that turned out to be a liquid fuel produced 3 components of 70% volume of gasoline, 20% volume of kerosene, and 10% volume diesel (diesel). The characterization product qualified by Persetujuan Prinsip Dirjen Migas No. 940/34/DJM.O/2002.

III. CONCLUSION

Optimizing Polystyrene Thermal Cracking Plastic Waste to Produce Liquid Fuel is an alternative treatment in reducing plastic waste into a source of environmental pollution. In this processing the resulting temperature is more optimal than the previous treatment, the temperature can be reached more than 300. This processing is more environmentally friendly because of the ongoing process of non-polluting and more efficient. Based on the analysis of polystyrene thermal cracking product which turned into a liquid fuel produced three components of 70% by volume of gasoline, Volume 20% of kerosene and 10% volume of diesel (diesel).

Acknowledgment

This paper is made possible through the help and support from everyone, including : parents, teachers, family, friends and in essence, all sentient beings.

First and foremost, we are grateful to the Allah SWT for establishing us to complete this paper

Second, we would like to thank our instructor for her most support and encouragement for giving us this paper. This gives us the experience on how to cooperate and engage ourselves in a serious project.

Finally, we sincerely thanks to our parents, family, and friends, who provide the advice and financial support. The result of this paper would not be possible without all of them. Thank you

References

- [1] MUJIARTO, I. (2005) *Sifat Dan Karakteristik Material Plastik Dan Bahan Aditif*. Semarang: Traksi.
- [2] PERTAMINA (PERSERO). (1996-2009) *Spesifikasi Minyak Bakar*. [Online] Available from: Corporate Website. [Accessed: 28th April 2011].

- [3] PERTAMINA (PERSERO). (1996-2009) *Spesifikasi Minyak Solar*. [Online] Available from: Corporate Website. [Accessed:28th April 2011].
- [4] PERTAMINA (PERSERO). (1996-2009) *Spesifikasi Minyak Tanah*. [Online] Available from: Corporate Website. [Accessed:28th April 2011].
- [5] PUTRI, A. (2011) *Tinjauan Terhadap Temperatur Operasi Pada Thermal Cracking Limbah Plastik Polysterine Untuk Menghasilkan Bahan Bakar Cair*. Palembang : Politeknik Negeri Sriwijaya.
- [6] PRATIWI, R. (2010) *Thermal Cracking Limbah Plastik Polyethylene Untuk Menghasilkan Bahan Bakar Cair Alternatif*. Palembang : Politeknik Negeri Sriwijaya.
- [7] SABARODIN, A. and Derwanto, A. (1998) *Pembuatan Minyak Bakar Dari Limbah Plastik Sebagai Sumber Energi Alternatif*. Yogyakarta: Buletin Penalaran Mahasiswa UGM Vol.4.50
- [8] SOETARJO, F. E. (2009) *Pembuatan dan Karakteristik Katalis dari Bentonite Pacitan Untuk Aplikasi Pembuatan Bahan Bakar Sintesis dari Limbah Plastik*. Bandung: Seminar Nasional Teknik Kimia.

A Finite Integration Method for A Time-Dependent Heat Source Identification of Inverse Problem

Rama Lesmana, Areena Hazanee, Aniruth Phon-On, Jarunee Saelee

Department of Mathematics and Computer Science
Faculty of Science and Technology, Prince of Songkla University
Pattani, Thailand

Email : lesmanarama5@gmail.com, areena.h@psu.ac.th, aniruth.p@psu.ac.th, jarunee.sa@psu.ac.th.

ABSTRACT

We investigate an inverse problem of reconstructing a timewise-dependent source for the heat equation. The solution of this problem is uniquely solvable, yet unstable. The inverse source problem two unknowns is reformulated to be a new form of forward problem one unknown. Furthermore, we propose that the finite integration method combined with the backward finite difference method can be used to solve the reformulated heat equation. The Tikhonov regularization method is employed to stabilize the noisy data. The proposed algorithm is not only easy to use but also can give an accurate and stable solution. Numerical result is presented and discussed.

Keywords: Heat Equation, Inverse Problem, Tikhonov Regularization.

I. INTRODUCTION

Inverse source problem for the heat equation commonly appear in mathematical modeling to identify the unknown source function in pollution source intensity, melting and freezing process. Recently, the inverse problem has been the point of interest by many authors, see [1,4,5,6,11]. The source can be determined as a function depending on both space and time for one dimension heat equation, in practical many researchers considered the heat source as a function of either space or time only. The identification of space-dependent heat source function can be seen in [2,7] whereas for the time-dependent heat source function can be seen in [13,14]. Furthermore, several numerical methods have been employed to seek out the time-dependent heat source function of the inverse problem [3,13,14].

In this present paper, we only focus on the identification for the time-dependent source function for the heat equation under the initial and the Neuman boundary conditions, together with the given observed data considered as the over-determination condition. Accordingly, we propose the finite integration method (FIM) with the ordinary linear approximation (OLA) to solve the inverse source problem. This proposed method is based on the trapezoidal rule which is numerical integration of using linear function to approximate the

integral. The FIM (OLA) was first reconstructed and introduced by [8] and has been improving to be able to solve various kinds of the differential equations. Therefore, this method has been extensively used for dealing the direct problem with both ordinary and partial differential equations. For example, the problem of nonlocal elastic bar under static [8], fractional-order of PDE [12] and extended to two dimensional potential problem [9]. However, no author has been using the FIM (OLA) to solve the inverse heat source problem. To deal with the inverse problem, there are many methods/procedures for obtaining the numerical solution such as method of fundamental solution (MFS), boundary element method (BEM) and the direct numerical method. In [13] has used the direct numerical method which is a method about to reform the inverse problem into the direct problem by using differentiation and integration. Therefore, in this study, we propose to use the FIM (OLA) to solve the inverse problem of finding the time-dependent heat source function by the direct numerical method.

The paper is organized as follows. In Section 2, the problem is clearly stated. In Section 3, the use of the direct method is applied mathematically to seek the time-dependent source function. In Section 4, the FIM (OLA)

is employed together with the backward difference in order to discretize the problem obtained from Section 3. In the Section 5, we use the Tikhonov regularization method to stabilize and approximate the noisy function. To illustrate a clear overview and test the accuracy of the proposed method, in Section 6, a benchmark numerical example is provided. Section 7 ends this paper with the conclusion.

II. THE PROBLEM STATEMENT

Let $D_T = C^2[0,1] \times C^1[0,T]$ be the solution domain with the final time $T > 0$. We consider the inverse problem of finding the pair solution $(f(t), u(x,t)) \in C([0,T]) \times C^{2,1}(D_T)$ for the following the heat conduction equation,

$$u_t(x,t) = u_{xx}(x,t) + f(t), \quad 0 < x < 1, \quad 0 < t < T, \quad (1)$$

subject to the initial data and boundary conditions

$$u(x,t) = u_0(x), \quad 0 < x < 1, \quad (2)$$

$$u_x(0,t) = s(t), \quad u_x(1,t) = r(t), \quad 0 < t < T. \quad (3)$$

The additional condition is considered as

$$u(x_f,t) = g(t), \quad 0 \leq x_f \leq 1, \quad (4)$$

In order to ensure the existence and uniqueness of the solution, the given functions $u_0(x)$, $s(t)$ and $r(t)$ are assumed to satisfy the following compatibility conditions:

- 1) $s, r \in C[0,T]$, $g \in C^1[0,T]$, and $u_0 \in C^1[0,1]$.
- 2) $(u_0)_x(0) = s(0)$, $(u_0)_x(1) = r(0)$, $g(0) = u_0(x_f)$.

One thing to note that although the inverse problem (1)-(4) under the above compatibility conditions is uniquely solvable, it is still ill-posed as the small errors in the input data leading to gain the large errors in the solution.

III. THE DIRECT METHOD

In [13] Xiangtuan *et al.* have established a direct numerical method which is an algorithm for seeking the time-dependent and space-dependent heat source of the inverse problems. In this present study, we would like to apply the algorithm of this method to the time-wise inverse heat source problem as following explanation. The purpose of method is not to determine the source directly but rather to construct the forward problem as an

access for obtaining the heat source eventually. In order to employ the direct numerical method suggested by [13] for solving the inverse problem (1)-(4), we firstly take the derivative with respect to x over the heat equation (1), this yields

$$u_{tx}(x,t) = u_{xxx}(x,t). \quad (5)$$

Let $w(x,t) = u_x(x,t)$ for $w(x,t) \in D_T$ and taking the integration with respect to x over $[x_f, x]$ gives

$$u(x,t) = \int_{x_f}^x w(y,t) dy + g(t). \quad (6)$$

Since $w(x,t) \in D_T$, then the differential equation (5) and the initial and boundary conditions (2)-(3) become

$$w_t(x,t) = w_{xx}(x,t), \quad (7)$$

with the reformed initial and boundary conditions

$$w(x,0) = (u_0)_x(x), \quad w(0,t) = s(t), \quad w(1,t) = r(t). \quad (8)$$

Taking the integration with respect to x on $[x_f, x]$ over the equation (5) gives

$$\int_{x_f}^x u_{tx}(x,t) dx = \int_{x_f}^x u_{xxx}(x,t) dx. \quad (9)$$

Then, we have

$$u_t(x,t) - u_t(x_f,t) = u_{xx}(x,t) - u_{xx}(x_f,t).$$

Consider the over-determination condition (4), i.e. $u(x_f,t) = g(t)$ and since $w_x(x_f,t) = u_{xx}(x_f,t)$, then we obtain

$$u_t(x,t) = u_{xx}(x,t) + g'(t) - w_x(x_f,t). \quad (10)$$

Here, the above heat equation (10) is now written as the heat equation (1) with the source function defined as

$$f(t) = g'(t) - w_x(x_f,t). \quad (11)$$

In general, the given data $g(t)$ normally consists some measurement errors unavoidably, we therefore use the

Tikhonov regularization method to stabilize the noisy function denoted as $g^\delta(t)$. Now let us summarize the systematic step for determining $f(t)$ as follows

- Step 1. Solve numerically the following problem to get $w(x_f, t)$:

$$\begin{aligned} w_t(x, t) &= w_{xx}(x, t), & 0 < x < 1, \quad 0 < t < T, \\ w(x, 0) &= (u_0)_x(x), & 0 < x < 1, \end{aligned} \quad (12)$$

$$w(0, t) = s(t), \quad w(1, t) = r(t), \quad 0 < x < 1,$$

- Step 2. Find $w_x(x_f, t)$ by using the central finite difference method.
- Step 3. Use the Tikhonov to stabilize noisy function $g(t)$.
- Step 4. Approximate the first-order derivative $g'(t)$ by the central finite difference method.
- Step 5. Compute $f(t)$ by $f(t) = g'(t) - w_x(x_f, t)$.

IV. THE USE OF FIM (OLA)

The FIM (OLA) is a renewed numerical method for solving the differential equation (the direct problem) suggested by Li *et al* [8]. In this section, we propose to use the FIM (OLA), [12], to discretize the space-wise and employ the backward finite difference method to discretize the time-wise of the reformulated problem in step 1 of (12).

A. Finite difference method

This subsection is devoted to describe the numerical method for approximating the timewise first order derivative of the unknown function $w(x, t)$ with respect to t . Let $w_j = w(x, t_j)$ for $t_j = j\Delta t$, $j \in \{0, 1, 2, \dots, M\}$ and $\Delta t = \frac{T}{M}$. Consider the uniform grid partitions

$$w_0 < w_1 < w_2 < \dots < w_M, \quad j \in \{0, 1, 2, \dots, M\},$$

we can approximate the first order derivative of unknown function $w(x, t)$ by using the backward FDM which can be expressed as

$$w_t(x, t) = \frac{w(x, t_j) - w(x, t_{j-1})}{\Delta t}. \quad (13)$$

B. Finite integration method

For dealing with the FIM, we start with approximating a definite integral of a smooth function from a to b ,

$\int_a^b w_j(x) dx$, by using the trapezoidal rule as the following formula

$$\int_a^b w_j(x) dx = \frac{\Delta x}{2} [w_j(x_0) + 2w_j(x_1) + \dots + 2w_j(x_{N-1}) + w_j(x_N)]$$

where $\Delta x = \frac{b-a}{N}$ and $x_i = a + i\Delta x$ for

$i \in \{0, 1, 2, \dots, N\}$. Define the (single-layer) definite integration function as

$$W^{(1)}(x_k) = \int_a^{x_k} w_j(x) dx \approx \sum_{i=0}^k a_{ki}^{(1)} w_j(x_i),$$

Where $a_{01}^{(1)} = 0$ and $a_{ki}^{(1)} = \Delta x \begin{cases} \frac{1}{2}, & i=0, k, \\ 1 & i=1, 2, \dots, k-1. \end{cases}$

And also the matrix form of integration is expressed as follow:

$$\underline{W}_j^{(1)} = A^{(1)} \underline{w}_j,$$

where

$$\underline{W}_j^{(1)} = \left[\int_a^{x_0} w_j(x) dx, \int_a^{x_1} w_j(x) dx, \dots, \int_a^{x_N} w_j(x) dx \right]^T,$$

$$\underline{w}_j = [w_j(x_0), w_j(x_1), \dots, w_j(x_N)]^T,$$

$$A^{(1)} = (\Delta x) \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 1/2 & 1/2 & 0 & 0 & 0 & 0 \\ 1/2 & 1 & 1/2 & 0 & 0 & 0 \\ 1/2 & 1 & 1 & 1/2 & 0 & 0 \\ \dots & \dots & \dots & \dots & \dots & \dots \\ 1/2 & 1 & 1 & 1 & 1 & 1/2 \end{bmatrix}_{(N+1) \times (N+1)}.$$

We then consider a double-layer definite integral as

$$W^{(2)}(x_k) = \int_a^{x_k} \int_a^{y_1} w_j(y) dy dy_1 = \sum_{i=0}^k \sum_{j=0}^i a_{ki}^{(1)} a_{ij}^{(1)} w_j(x_i).$$

Here, we reform the double-layer integral above as

$$W^{(2)}(x_k) = \sum_{i=0}^k a_{ki}^{(2)} w_j(x_i, t)$$

where

$$a_{01}^{(2)} = 0 \text{ and } a_{ki}^{(2)} = \Delta x \begin{cases} \frac{1+2(k-2)}{4}, & i=0, \\ k-i, & i=1, 2, \dots, k-1, \\ \frac{1}{4}, & i=k. \end{cases}$$

Again, we can write this in matrix form as

$$\underline{W}_j^{(2)} = A^{(2)} \underline{w}_j,$$

where

$$\underline{W}_j^{(2)} = \left[\int_a^{x_0} \int_a^{y_1} w_j(y) dy dy_1, \int_a^{x_1} \int_a^{y_1} w_j(y) dy dy_1, \dots, \int_a^{x_N} \int_a^{y_1} w_j(y) dy dy_1 \right]^T,$$

$$\underline{w}_j = [w_j(x_0), w_j(x_1), \dots, w_j(x_N)]^T,$$

$$A^{(2)} = (\Delta x)^2 \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 1/4 & 1/4 & 0 & 0 & 0 & 0 \\ 3/4 & 1 & 1/4 & 0 & 0 & 0 \\ 5/4 & 2 & 1 & 1/4 & 0 & 0 \\ \dots & \dots & \dots & \dots & \dots & \dots \\ \frac{1+2(N-1)}{4} & N-1 & N-2 & \dots & 1 & 1/4 \end{bmatrix}_{(N+1) \times (N+1)}$$

One thing to note that $A^{(2)} = A^{(1)} A^{(1)}$. Therefore if we denote $A = A^{(1)}$, we can get $A^2 = A^{(2)}$. To use the FIM (OLA) for solving the differentiation equation as in problem (12) we can perform by taking the integration with respect x twice over the heat equation and combining with (13). Therefore, the PDE in (12) becomes

$$A^2 \underline{w}_j - \Delta t \underline{w}_j = A^2 \underline{w}_{j-1} + c_0 \underline{x} + c_1 \underline{i},$$

in discrete sense. Where c_0 and c_1 are integral constants, $\underline{x} = [x_0, x_1, \dots, x_N]^T$ and $\underline{i} = [1, 1, \dots, 1]^T$. For more detail on how to solve the system, we will describe in the section of numerical example.

V. THE TIKHONOV REGULARIZATION

As along the previous section, the equation (11) holds the first-order derivative $g'(t)$. Since the measured data $g(t)$ is normally obtained from the experiment and there exist measurement errors unavoidably. We denote g^δ as a noisy observed data. This brings us to involve an ill-posed problem of the first-order numerical differentiation.

Hence, we should tackle the first-order numerical differentiation stable approximation method. In this section, we wish to employ the Tikhonov regularization method to stabilize the noisy data g^δ by the following Tikhonov functional,

$$H_\alpha(g_\alpha^\delta) = \|g_\alpha^\delta(t) - g^\delta(t)\|^2 + \alpha \left\| \frac{d^2 g_\alpha^\delta(t)}{dt^2} \right\|^2, \quad (14)$$

where g_α^δ is the selected data obtained from the minimization (14) with the appropriate regularization parameter α . Eventually in the numerical process, we can obtain a stabilize data $g_\alpha^\delta(t)$ by minimizing the functional (14) as

$$\underline{g}_\alpha^\delta = (I + \alpha R^T R)^{-1} (\underline{g}^\delta), \quad (15)$$

where R is the regularization matrix to be used as the second order derivative as

$$R_2 = \begin{bmatrix} -1 & 1 & 0 & 0 & 0 \\ 1 & -2 & 1 & 0 & 0 \\ 0 & 1 & -2 & 1 & 0 \\ \vdots & \ddots & \ddots & \ddots & \ddots \\ 0 & \dots & 1 & -2 & 1 \\ 0 & \dots & 0 & 1 & -1 \end{bmatrix}_{(N+1) \times (N+1)}.$$

Here, we are using the scaling technique to avoid the large value by omitting the step size term $\frac{1}{(\Delta t)^2}$. Thus

stabilized data g_α^δ is now used to approximate the first-order derivative $(g_\alpha^\delta)'$ by using the finite difference method as following formula:

For $i = 0$,

$$(g_\alpha^\delta)'(t_i) = \frac{g_\alpha^\delta(t_{i+1}) - g_\alpha^\delta(t_i)}{\Delta t},$$

for $i = 1, 2, \dots, M-1$,

$$(g_\alpha^\delta)'(t_i) = \frac{g_\alpha^\delta(t_{i+1}) - g_\alpha^\delta(t_{i-1})}{2\Delta t},$$

For $i = M$,

$$(g_\alpha^\delta)'(t_i) = \frac{g_\alpha^\delta(t_i) - g_\alpha^\delta(t_{i-1})}{\Delta t},$$

Therefore, the source function $f(t)$ can be calculated as the formula in step 5 of (12) as $f(t) = (g_\alpha^\delta)'(t) - w_x(x_f, t)$.

VI. NUMERICAL EXAMPLE

In this section, we present a benchmark test example to illustrate the accuracy of the method presented in the previous section. In order to review the accuracy of the numerical result, we introduce the root mean square error (RMSE) defined as

$$\text{RMSE}(f(t)) = \sqrt{\frac{T}{M+1} \sum_{i=0}^M (f_{\text{exact}}(t_i) - f_{\text{numerical}}(t_i))^2}.$$

In this example, we consider the inverse problem (1)-(4), with $T = 1$, the input data are given as

$$u(x, t) = u_0(x) = x^2 \quad \text{for } x \in [0, 1]$$

$$u_x(0, t) = 0 = s(t), \quad \text{and } u_x(1, t) = 2 = l(t), \quad t \in [0, 1],$$

and the additional condition is given by

$$u\left(\frac{1}{2}, t\right) = g(t) = \frac{1}{4} + 2t + \sin(2\pi t), \quad t \in [0, 1].$$

The number of discretization of space x and time t are $N = 10$ and $M = 30$, respectively. We investigate the solution $f(t)$ along the noisy data $g^\delta(t)$, contaminated as

$$\underline{g}^\delta = \underline{g} + \text{random}('Normal', 0, \sigma, 1, M),$$

where the $\text{random}('Normal', 0, \sigma, 1, M)$ is a command in MATLAB generating randomly the variable from normal distribution with zero mean and standard deviation σ which is taken to be $\sigma = p \times \max_{0 \leq t \leq T} |g(t)| = 2.25p$, and p is the percentage of the error. A regularization formula holds regularization parameter α , basically, a regularization parameter $\alpha > 0$ controls the neighborhood properties of the auxiliary problem. Larger values of α indicates higher stability of the approximate solution but this makes the auxiliary problem being far from the original one. While values of α near zero expresses the auxiliary problem close to the original one, but this leads to become still unstable as $\alpha \rightarrow 0$. Hence, the suitable regularization parameter has to be chosen carefully with consideration between the conflicting purpose of stability and approximating, [15]. Actually, there are many methods to choose the regularization parameter α such as the discrepancy principle criterion, the generalized cross-validation (GCV) or the L-curve method. Nevertheless in this study, the regularization parameter α is chosen according to the trial and error. This means that we consider the error in each value cases and then select the regularization parameter which yields the smallest error. In order to illustrate the accuracy of the method, the analytical solution of this inverse problem is given as

$$f(t) = 2\pi \cos(2\pi t), \quad t \in [0, 1].$$

For the forward problem (1)-(3), $f(t)$ is known function, we have tried to solve the forward problem by using the FIM (OLA) together with the FDM, we first discretize the first derivative of u with respect to t by FDM, then take the integration twice over its discretized equation and yield

$$A^2 \underline{u}_j - \Delta t \underline{u}_j = A^2 \underline{u}_{j-1} + \frac{\Delta t}{2} f_j \underline{x}^2 + c_0 \underline{x} + c_1 \underline{i},$$

where c_0 and c_1 are integral constants, $\underline{x} = [x_0, x_1, \dots, x_N]^T$ and $\underline{i} = [1, 1, \dots, 1]^T$. Although we do not present the temperature result $u(x, t)$ graphically yet, we can even know how good the method for solving the forward problem as its mean average error is less than 1%.

The powerful method extends to the inverse problem. Firstly, we consider the case of exact data, i.e. no noise is added to the additional condition. The analytical and numerical solutions of $f(t)$ are displayed in Figure 1. This can be clearly seen that the proposed method in this study can capture the heat source term $f(t)$ in very good agreement with RMSE=0.0324 as shown in table 1.

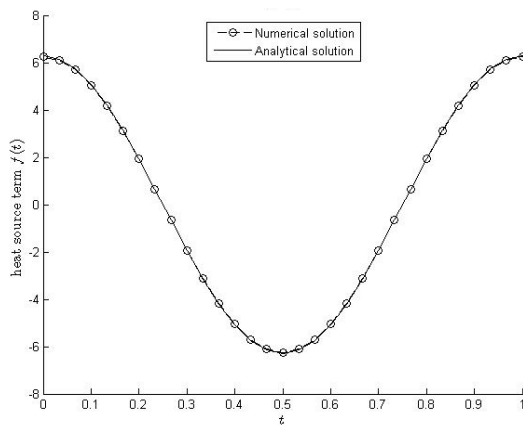


Figure 12. The analytical and numerical result of $f(t)$ for the exact data.

TABLE IV. THE VALUE OF λ AND RMSE FOR $f(t)$ AND $g(t)$

| p | λ | RMSE of $g(t)$ | RMSE of $f(t)$ |
|-----|-----------------|----------------|----------------|
| 0% | $\lambda = 0$ | 0 | 0.0324 |
| 3% | $\lambda = 0$ | 0.093977 | 1.9807 |
| 3% | $\lambda = 0.6$ | 0.062605 | 1.1078 |
| 3% | $\lambda = 3.1$ | 0.066401 | 1.3482 |

In the case of noisy data, as we have mentioned earlier, we add noise to the over-determination condition (4) with 3% noisy input. Then now the specific temperature is

perturbed as g^δ . Figure 2(a) displays the numerical result of $f(t)$ obtained by using the algorithm introduced in Section 3 with $p = 3\%$ noisy input and with no regularization, i.e. $\lambda = 0$. This can be seen that the numerical solution is inaccurate unstable since a 3% small perturbation causes significant error in the solution. In order to retrieve this issues, we then employ the Tikhonov regularization method that we have mentioned in the Section 4. By the trial and error of selecting the regularization parameter among 10^{-6} to 1, we found that $\lambda = 0.6$ is the most suitable regularization parameter for this problem.

Figure 2 illustrates the numerical results obtained when applying the second-order Tikhonov regularization. From Figure 2(b) we can observe that the numerical results are alleviated, compare to Figure 2(a). In addition, the smoothest result for this example can be obtained when setting $\lambda = 3.1$ and that is shown in Figure 3. This can be seen that the interior point of numerical solution, i.e. $t \in [0.1, 0.9]$ approximately, is more accurate and stable, whereas the starting and end point on $t \in \{0, 1\}$ are getting far away from the exact one.

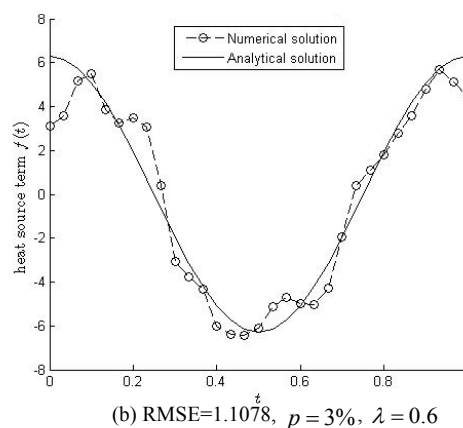
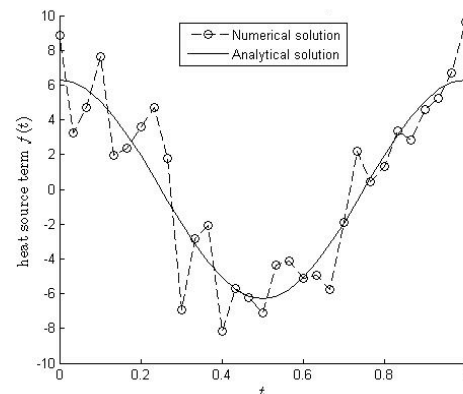


Figure 13. The analytical and numerical result of $f(t)$ with $\lambda = \{0, 0.6\}$

The inaccuracy at both starting and end points is frequently found elsewhere when using stabilizing technique such as the Tikhonov regularization method. Accordingly, this is obviously seen that the FIM (OLA) and Tikhonov regularization can be used to deal with the inverse problem. In [13] Xiangtuan *et al.* combined the direct numerical method with the finite difference method for solving this kind of problems. The method really works well with appropriate step length but this has one drawback: This algorithm always needs requirement of step length i.e. $\frac{\Delta t}{(\Delta x)^2} \leq \frac{1}{2}$. This can be

noted that with $N=10$ and $M=30$, which is not satisfied the above requirement. As a long to the requirement of step length, to set up $N=10$ we need to put $M=300$ which is a large number of time discretization and it also makes long computational time. Then we can conclude here that the FIM is a success method to deal with time-dependent inverse heat source, without any requirement of step length.

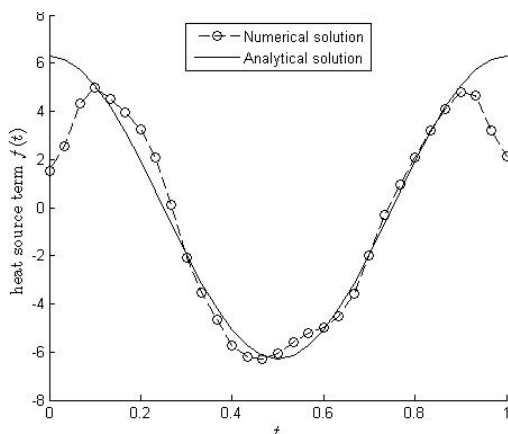


Figure 14. The analytical and numerical result of $f(t)$ with $\lambda = 3.1$

VII. CONCLUSION

The inverse problem of finding the time-dependent source function has been discussed. The inverse heat source problem, with two unknown, has been transformed to be a forward problem, with an unknown by employing the direct numerical method suggested by [13]. The numerical discretization of the forward problem was based on the finite integration method combined with the backward finite difference. Since to obtain the unknown source function $f(t)$ holds the first-order derivative $g(t)$ which is an observed data

containing measurement errors. Furthermore, the Tikhonov regularization method has been employed together with the trial and error for selecting the suitable regularization parameter. The numerical result was found to be accurate and stable at interior points, yet not at both starting and end points.

Acknowledgment

Our massive gratitude goes to Faculty of Science and Technology, Prince of Songkla University for supporting the study with SAT-ASEAN Scholarship for international students and Graduate School, Prince of Songkla University for providing research funding.

References

- [1] A. Farcas and D. Lesnic. The boundary-element method for the determining of a heat source dependent on one variable. *Journal of Engineering Mathematics*, 2006, pp. 375-388.
- [2] A. Hasanov. Simultaneous determination of source terms in a linear parabolic problem from the final overdetermination: Weak solution approach.. *Journal of Mathematical Analysis and Applications*, 2007, pp. 766-779.
- [3] A. Hazanee., M. I. Ismailov, D. Lesnic and N. B. Kerimov. An inverse time-dependent source problem for the heat equation. *Applied Numerical Mathematics*, 2013, pp. 13-33.
- [4] A. Hazanee, D. Lesnic, M. I. Ismailov and N. B. Kerimov. An inverse time-dependent source problem for the heat equation with a non-classical boundary condition. *Applied Mathematical Modelling*, 2015, pp. 6258-6272.
- [5] M. I. Ismailov, F. Kanca, D. Lesnic. Determination of time-dependent heat source under nonlocal boundary and integral overdetermination conditions. *Applied Mathematics and Computation*, 2011, pp. 4138-4146.
- [6] N. I. Ivanchov. On the determination of unknown source in the heat equation with nonlocal boundary conditions. *Ukrainian Mathematics Journal*, 1995, pp. 1647-1652.
- [7] T. Johansson and D. Lesnic. A variational method for identifying a spacewise-dependent heat source. *Journal of Applied Mathematics*, 2007, pp. 748-760.
- [8] M. Li, Y. C. Hon, T. Korakianitis and P. H. Wen. Finite integration method for nonlocal elastic bar under static and dynamic loads. *Engineering Analysis with Boundary Elements*, 2013, pp. 842-849.

- [9] M. Li, Y. C. Hon, Z. L. Tian, C. S. Chen and P. H. Wen. Improved finite integration method for partial differential equations. *Engineering Analysis with Boundary Elements*, 2016, pp. 230-236.
- [10] S. Lu and Y. Wang. First and second order numerical differentiation with Tikhonov regularization. *Numerical Mathematics*, 2006, pp. 354-367.
- [11] I. Malyshev. An inverse source problem for heat equation. *Journal of Mathematical Analysis and Application*, 1989, pp. 206-218.
- [12] P. H. Wen, Y. C. Hon, M. Li. and T. Korakianitis. Finite integration method for partial differential equations. *Applied Mathematical Modelling*, 2013, pp. 100092-10106.
- [13] X. Xiangtuan, Y. Yaomei and W. Junxia. A direct numerical method for solving inverse heat source problems. *Journal of Physics: Conference Series*, 2010, pp. 1-9.
- [14] L. Yan. C. L. Fu and F. L. Yang. The method of fundamental solution for the inverse heat source problem. *Engineering Analysis with Boundary Elements*, 2008, pp. 216-222.
- [15] T. Schuster, B. Kaltenbacher, B. Hofmann and K. S. Kazimierski. Regularization Methods In Banach Spaces. Berlin: Gruyter, 2012, pp.56–57.

A Comparative Study of Green Technology in Cement Industry

Restu Kholifatul Ummi

Civil Engineering

North China University of Water Resources and Electric Power (NCWU)

PPI DUNIA (Indonesian Student Association of the World)

Zhengzhou, China

restu_ummi@yahoo.com

ABSTRACT

The insufficiency of infrastructure is the main bottlenecks in Indonesian society that prevent higher economic growth, as it weakens connectivity hence increasing logistics costs, making businesses less competitive, and also initiating social problems. Then the Indonesian government has given more attention to infrastructure development in order to enhance the economic growth. Cement industry is one of the industries that are very important in supporting the development of infrastructure and property. However, a large number of demonstrations against the operation of a cement factory have been arising from some protest and communities (Civil Society Organization/LSM) due to the environmental issues. In general, every ton of Ordinary Portland Cement (OPC) that is manufactured releases on a similar amount of CO₂ into the atmosphere, or for roughly 6% of all human-generated greenhouse gas emissions. A developed production method that minimizes or eliminates CO₂ emissions from cement manufacturing process is essential. Innovation on green or environmentally technology in cement industry with the focus on green energy (use of renewable energy sources or alternative fuel and higher energy efficiency), green products (use of an industrial waste as raw material), and green processes (reducing waste generation and conserving water, hence improving operational efficiency and lowering costs) become the global trends. In this study, the latest developments in eco-friendly technologies of the mining/quarrying operations and cement manufacturing that will be operated in Rembang by PT Semen Indonesia will be described and compared with the other countries. Existing technologies in the European cement industry has made significant progress in reducing the environmental impact of the industry. It is including the rehabilitation of the quarry to protect and promote biodiversity, more efficient clinker and cement production processes that reduce greenhouse emissions, provide waste utilization, and produce innovative concrete which can reduce the energy consumption of buildings and roads. Cement factory that will be operated in Rembang by PT Semen Indonesia is applying a modern environmentally friendly plant with the latest technology and a higher efficiency than another cement factory in Asia (more efficient use of water, chemicals, fuel and electricity). Quarrying methods will be used a Zero Run Off concepts, in which the ground water is carefully managed to prevent the discharge from the mine area, then the amount of ground water is increased. In addition to the utilization of renewable energy biomass as an alternative fuel, they also developed technology that converts the hot exhaust gasses into electrical energy through the Waste Heat Recovery Power Generation (WHRPG) project. Then, these technologies will become a pioneer and a standard for the construction of a new cement industry in Indonesia. Direct effect of the cement factory operation to the local communities will also be discussed.

Keywords : Cement industry, green technology, Zero Run Off concepts, Waste Heat Recovery Power Generation (WHRPG) project.

I. INTRODUCTION

The lack of quality and quantity of infrastructure is the main bottlenecks in Indonesian society that prevent higher economic growth, as it weakens connectivity hence increasing logistics costs, making businesses less competitive. It also can initiate social problems because access to healthcare can be difficult in the rural regions. Then the Indonesian government has given more attention to infrastructure development in order to enhance the economic growth. Cement industry is one of the industries that are very important in supporting the development of infrastructure and property. Many programs that launched by the government, for example, "one million houses program", the 35,000 MW power plant program, the 2,700 kilometers-long Trans-Sumatra toll road, and the construction of smelters, will require plenty of cement [1]. However, a large number of demonstrations against the operation of a cement factory have been arising from some protest and communities (Civil Society Organization/LSM) due to the environmental issues, especially with the operation of a new cement plant in Rembang.

The cement industry is facing unprecedented challenges relating to energy resources, CO₂ emissions and the use of alternative materials. In general, every ton of Ordinary Portland Cement (OPC) that is manufactured releases on a similar amount of CO₂ into the atmosphere, or for roughly 6% of all human-generated greenhouse gas emissions [2]. OPC is a vital construction material and also a strategic commodity. A developed production method that minimizes or eliminates CO₂ emissions from cement manufacturing process is essential. Then, innovation on green or environmentally technology in cement industry with the focus on green energy (use of renewable energy sources or alternative fuel and higher energy efficiency), green products (use of an industrial waste as raw material), and green processes (reducing waste generation and conserving water, hence improving operational efficiency and lowering costs) become the global trends [2-15]. Existing technologies in the European cement industry has made significant progress in reducing the environmental impact of the industry. It is including the rehabilitation of the quarry to protect and promote biodiversity, more efficient clinker and cement production processes that reduce greenhouse emissions, provide waste utilization, and produce innovative concrete which can reduce the energy consumption of buildings and roads. Cement factory that will be operated in Rembang by PT Semen Indonesia is also will apply a modern green technology plant. In this study, the latest developments in eco-friendly technologies of the mining/quarrying operations and cement manufacturing in existing plant PT Semen Indonesia and new Rembang

plant will be described and compared with the European cement industry. Direct effect of the cement factory operation to the local communities will also be discussed.

II. LITERATURE REVIEW

There are many studies about green technology in cement industry that have been published, but the comparison study of the latest technology is still limited. Imbabi et al. have been investigated about trend and development in green cement and concrete technology [2]. They conclude that locally recycled materials and waste from industry may be suitable for blending with OPC as a substitute both in laboratory tests and in practice. They also presented the economics of cement production and the trends in the UK and USA to inform future developments in cement production based on maximizing the value of carbon reduction. Benhelal et al. have been reviewed about global strategies and potentials to curb CO₂ emissions in cement industry [3]. They described three strategies of CO₂ reduction including energy saving, carbon separation and storage as well as utilizing alternative materials.

Recent studies and potentials to mitigate CO₂ emissions in cement plant are developed in Europe. In UK, Popescu et al. compared the energy consumption and carbon dioxide emission during production of belite cement and OPC [4]. It was concluded that the energy consumed during production of belite cement was 500-540 kJ/kg less than producing the OPC. In Spain, Rodriguez et al. were proposed a new process to produce carbon dioxide in pure form [5]. As a result, it was possible to reduce 50% of carbon dioxide emission as compared to the conventional process. In France, Cazacliu and Ventura have compared a dry batch and a central mixed plant in terms of technical, environmental and economic aspects [6]. Results indicated that the Environmental Amortization Duration Time (EADT) for CO₂ and particles were below 6 years. Moya et al. have been carried out the cost-effectiveness analysis of some of the Best Available Technologies (BAT) that could result in energy consumption and CO₂ emissions reduction in the European Union's (EU27) cement industry [7]. The results indicated that the possible thermal energy improvement in the clinker production was 10%. Valderrama et al. have been studied the potential improvements of a cement plant in Catalonia (Spain) by upgrading the cement production lines [8]. It was shown that 5% of the impact of global warming could be reduced by implementing new production line.

Several studies have been carried out aimed to utilized alternative materials and alternative fuel in European cement industry. In Portugal, Kikuchi has

reported a technology for producing cement from incineration ash of municipal solid waste, incineration ash of sewage sludge and other wastes such as aluminum dross and copper slag [9]. Mokrzycki et al. were studied the ecological and economical features of utilizing alternative fuels made from waste in the Lafarge Cement, Poland [10]. Prisciandaro et al. were analyzed the experimental results of the emission of alternative fuels replaced with conventional fuel in two different cement plants in Italy [11]. Results indicated that if less than 20% of regular fuel is replaced with tire, stack emissions (NO_x , SO_2 and CO mainly) were slightly increased. In France, Gartner has studied the feasibility of replacing Portland cement with alternative hydraulic cement that could result in lower total CO_2 emissions [12].

These innovation efforts, as described above, have turned the cement industry in Europe into the most active research. Data of the existing cement industry in Europe in this work is obtained mostly from the report of Boston Consulting Group [13], sustainability report of Lafarge Holcim [14] and also from CEMBUREAU or European Cement Association (the representative organization for the cement industry in Europe).

III. METHODOLOGY

A comprehensive report and research about green technology in cement industry were reviewed based on the methodology in Fig. 1. This study is initiated based on the fact that innovation in green technology in cement industry that minimizes or eliminates CO_2 emissions is essential. Various environmentally technologies in cement industry have been developed, especially in Europe. PT Semen Indonesia stated that a new cement plant in Rembang will adopt the latest developments in eco-friendly technologies [15]. How far this technology will be applied in new Rembang plant and its effect on CO_2 emissions are the main problem statement in this study. The latest developments of green technology in this study will focus on three areas: (1) green energy

(use of renewable energy sources or alternative fuel), (2) green products (use of an industrial waste as raw material become a new product), and (3) green processes (reducing waste generation, reducing emissions and conserving water). The recent conditions of green technology that will be compared are the existing technology in the European cement industry, the existing plant of PT Semen Indonesia and new installations that will be operated in Rembang plant. The assessments of this comparative study are based on the quality and quantity of the green technology applied, CO_2 emissions reduction, energy efficiency, etc. The advantage of the cement factory operation to the development of local communities is invaluable and it will support the analysis and conclusions in this paper.

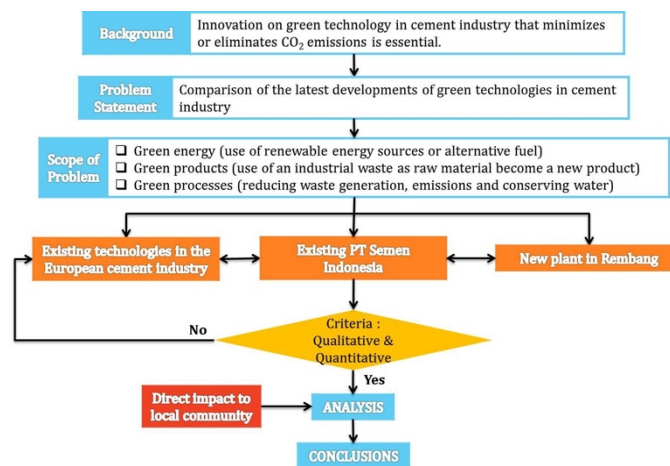


Figure 1. Flowchart of the research methodology used in this study.

VIII.IV. RESULTS AND DISCUSSION

To study the comparison of the green technology in cement industry, we must understand the process flow of cement production and the main sources of emissions that will be discussed in section IV.A. Then, every

development in the process production will be described and compared in section IV.B. The assessment of the green technology in new Rembang plant and direct impact to the local community will be discussed in section IV.C and IV.D, respectively.

A. Process Flow of Cement Production and Sources of Emissions

The process flow of cement production together with the alternative input and sources of particulate and gas emissions is shown in Fig. 2. A conservative estimate for every 1 kg of cement produced gives a by-product of 0.9 kg of carbon dioxide, this equates to 3.24 billion tons of CO₂ per year [2]. The production of Portland cement begins with the quarrying of raw materials (limestone). Most cement factories are located near a limestone quarry to reduce transportation costs. Quarrying limestone involves drilling, blasting, excavating as well as crushing, screening and storing. Limestone is mixed together with clay, iron sand and silica sand to achieve the appropriate compositions and start the first stage of grinding with crusher into the form of powder. The alternative raw materials from third-party industrial waste are also used and mixed together as the development of green processes. Only the operation of machinery is responsible for CO₂ emissions when quarrying for raw materials (about 7% of total emissions) [2].

The raw mill then heated in the preheater and the heating is continued inside the rotary kiln to a temperature 1450 °C with pulverized coal and additional alternative fuels. Rotary kiln is a long cylindrical rotary furnace that turns around once or twice every minute. Temperatures are generally around 1400-1600 °C, and energy demand varies depending on the calcination process. Through a chemical reaction known as calcination, the raw materials are turned into cement clinker granules. Calcination is the decomposition of calcium carbonate (limestone) to calcium oxide (lime) in order to produce basic cement usually referred to “calcine”, and in the cement business, it is called clinker. Clinker crystal is cooled in clinker cooling and the heat output is recirculated to the preheater to save energy. The theoretical heat requirement for clinker-making is calculated to be about 1.75 MJ per kg. The calcination

process is the main sources of emissions (contribute to 50% of total emissions) [2]. The CO₂ emissions result from fuel consumption in the kiln and the de-carbonation of limestone to produce CaO ($\text{CaCO}_3 + \text{Heat} \rightarrow \text{CaO} + \text{CO}_2$). Using clinker substitutes may reduce calcination CO₂ emissions but will generally require more heat energy.

Clinker is ground again with gypsum as well as additives to produce fine cement powder. Then, the fine clinker is stored in cement storage (silos). From this silo, cement is packed and distributed in packaging bags. The CO₂ emission in 2012 is 3.24 billion tons of CO₂ per year [2]. The projected CO₂ emissions in 2050 from the cement industry if no changes are made to current production methods is increased by almost 5 times the value in 1990. This would be very bad news indeed and so must clearly never be allowed to happen. Cement industry must reduce CO₂ emissions by promoting the best available efficiency technologies for new and existing production plants, increasing awareness of alternative fuels and encouraging clinker substitution.

The energy efficiency of cement production varies significantly depending on the cement production process and the rotary kiln technology. Over the past decades, the cement industry in Europe has heavily invested in rotary kiln technology with now more than 90 percent of the kilns being highly efficient dry kilns, and less than 10 percent semi-wet and wet kilns [2,13]. These developments have improved thermal and heat efficiency reduced the amount of water that needs to be evaporated in the kiln, and, overall, improved energy efficiency in the clinker production process. In addition to installing cleaner technologies, the cement industry also focuses strongly on the operational efficiency of a plant. Equipment must be operated efficiently and maintained correctly to ensure that the maximum potential savings are achieved.

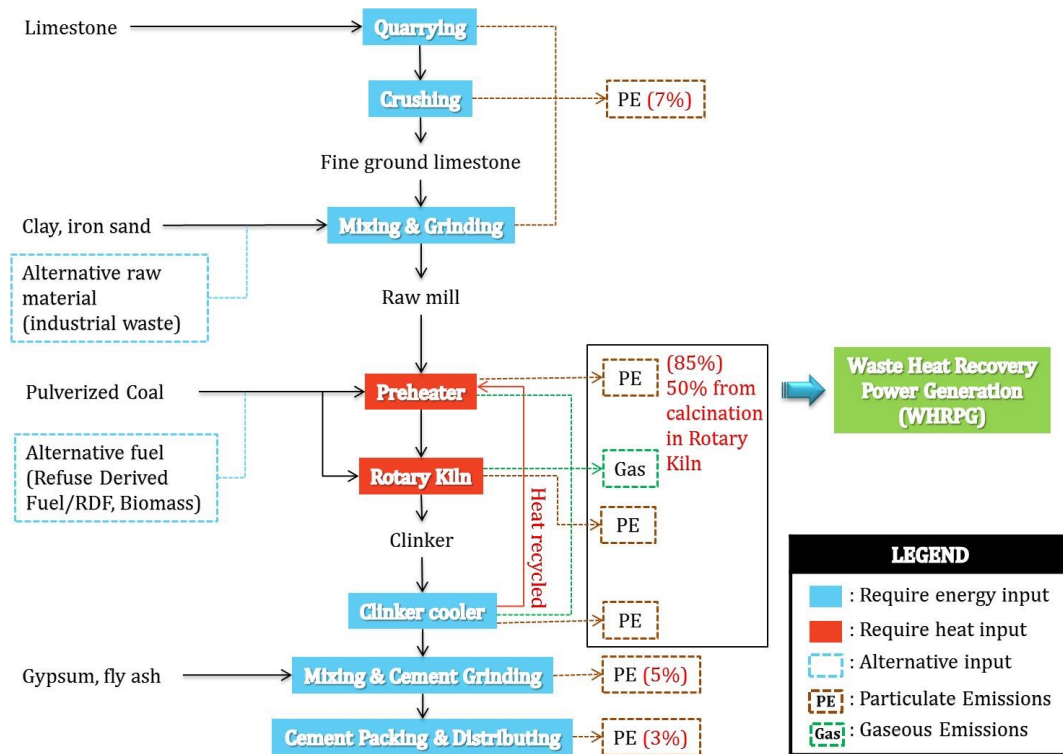


Figure 2. Process flow of cement production together with the alternative input and the main sources of emissions.

B. Comparison of the Green Technology in Cement Industry

The European cement industry has made tremendous efforts to reduce its greenhouse gas emissions. As a result, the cement industry in Europe has a low CO₂ emission rate per ton of product (0.65 million tons of gross CO₂ emissions) [13]. A consistent focus on research and innovation has resulted in new, more environmentally-friendly production technologies, innovative products and increased resource efficiency. These innovation efforts have turned the cement industry in Europe into the second most active in terms of patent filing in 2011, after Asia-Pacific (excluding China), accounting for more than 800 patents. Also, Europe is the

main global equipment supplier to the cement industry, accounting for over 60 percent of the global market (excluding China) [13]. Technologies developed in Europe are often then transferred to other parts of the world. The main initiatives or development to control emissions in line with the efforts to save energy and environments are divided into; (1) reclamation and biodiversity after quarrying, (2) alternative raw material, (3) alternative fuel, (4) Waste Heat Recovery Power Generation (WHRPG), (5) green product and (6) other development. The comparison and assessment of the green technology between existing PT Semen Indonesia (including a new plant in Rembang) and existing European cement industry are summarized in Table 1.

TABLE I. THE COMPARISON AND ASSESSMENT OF THE GREEN TECHNOLOGY

| No | Development / Technology | Existing European cement industry | | Existing PT Semen Indonesia (new plant in Rembang) | | Assessment | |
|----|--|---|---|--|--|-------------|----------------------------|
| | | Description | Quantity | Description | Quantity | Qualitative | Quantitative ¹⁾ |
| 1 | Reclamation and biodiversity after quarrying | Biological corridors/ green infrastructure, artificial bat cave, | Total rehabilitated area: 15.96 hectares (Lafarge Holcim, France) | Freshwater fish farming, development of mangrove forests, conservation of Javan deer | Total rehabilitated area: 80.42 hectares (Tuban plant) | ✓ | ⇕ |
| 2 | Alternative raw material | Recovering waste materials, industrial by-products | Alternative raw material substitution rate: 10.5% (Lafarge Holcim, France). | Blended cement program (hazardous and toxic waste) | Alternative raw material substitution rate: 6.27% (Tuban plant). | ✓ | ⇓ |
| 3 | Alternative fuel | Waste tires, sewage sludge, plastics, waste oils and biomass | Reduce CO ₂ emissions: 100,000 tons/yr (Lafarge Holcim, France). | RDF (Refuse Derived Fuel) and Biomass | Reduce CO ₂ emissions: 10,000 tons/yr from RDF, 150,000 tons/yr from biomass. | ✓ | ⇕ |
| 4 | WHRPG | ORC (Organic Rankine Cycle) plant | Capacity: 7 MW. Reduce CO ₂ emissions: 30,000 tons/yr (Rohrdorf, Germany) | Waste Heat Recovery Power Generation (WHRPG) joint with Nedo, Japan | Capacity: 8.5 MW (Indarung Padang plant), 30.6 MW (Tuban plant) Reduce CO ₂ emissions: 122,000 tons/years | ✓ | ⇕ |
| 5 | Green product | Zero-emission concrete, pervious concrete, photocatalytic concrete, insulated concrete | Recycling rate of ~46 percent | Porous concrete, flash concrete, blended or mix cement | Not available | ✓ | ⇓ |
| 6 | Other development | zero “process-water discharge” NO _x , SO _x and dust emissions reduction | Dust emissions: 55 gr/ton cement, NO _x emissions: 982 gr/ton cement, SO _x emissions: 196 gr/ton cement (Lafarge Holcim) | Zero Run Off, main bag house filter, long belt conveyor, Wirtgen and Vermeer equipment (Rembang plant) | Dust emissions: below 30 mg/Nm ³ (Rembang plant) NO _x emissions: 80 mg/m ³ , SO _x emissions: 4 mg/m ³ (Tuban plant) | ✓ | ⇔ |

1) ⇔ : equal, ⇕: higher, ⇓: lower

1) Reclamation and Biodiversity After Quarrying

Cement industry is dependent on access to raw materials for the production of clinker. As a result, nature conservation, biodiversity and ecosystems management play an important role in its long-term resource and reserve strategy. Quarrying and biodiversity are compatible through correct resource management before, during and after extraction. For example, correct quarry rehabilitation can help minimize the impact of invasive species through the introduction of native species, as seen in Portugal [13]. In France (Altkirch), almost half of the exploited area has been completely rehabilitated and has resulted in significant biodiversity enrichment. The Lafarge Holcim quarry in Yepes, Spain, covers 1,000 hectares in the center of the semi-arid Iberian Peninsula [14]. They have progressively restored the quarry over a

number of years. They also have avoided monoculture pine re-planting. Instead, they provided heterogeneous with slopes, holes, and ponds, creating habitats for fauna that was already colonizing these areas.

Quarry rehabilitation can also contribute to the development of biological corridors (referred as green corridors) or green infrastructure. In the UK, a site has built an artificial bat cave, which is intended to provide an alternative long-term safe haven for bats [13]. Some companies focus on the rehabilitation of ecosystem services, which can include flood resilience, pollination, leisure facilities, as well as support for the local heritage, and in many instances, these actions address the needs of the local community. In Spain, one site has rehabilitated its quarry to provide not only habits of particular species but also leisure facilities (such as cross-country cycling,

picnic areas and botanic paths) for the enjoyment of the local communities.

Existing PT Semen Indonesia conducts quarrying process of raw materials with consideration to biodiversities like conservation of flora and fauna, post-quarrying activities and reforestation. Then, no quarries in all work areas are located within and adjacent to the protected area and conservation area. The quarrying operations adopted the tiered system, which is completing one tier/plot and then moving to another plot. Thus, significant negative impact on biodiversity can be minimized. Until the end of 2015, PT Semen Indonesia has planted 57,362 trees for reforestation, covering an area of 80.42 hectares in Tuban plant [15].

In addition, PT Semen Indonesia has the initiative to optimize the clay post-quarrying area in Tuban as the freshwater fish farming with floating cages to maintain the sustainability of coastal area environment named Green Socorejo program. The area has been designated by the regional government as a strategic area for fishing zone, fish pond culture, maritime industry, agro-industry, wetland agriculture, forests, tourism, and development of mangrove forests to mitigate disasters. Through this program, Semen Indonesia has contributed by planting 60,000 trees. The planting was conducted along the coastal border area of Socorejo village that stretches approximately along 1.7 km with an area of approximately 6 hectares. The trees planted in the area are "*Casuariana equisetifolia*" and Mangrove ("*Rhizophora mucronata*"). Conservation of "*Rusa Timorensis*" or better known as Javan deer is also conducted to maintain populations of endangered fauna in their natural habitat [15].

2) Development of Alternative Raw Material

Over the last 20 years, the cement industry in Europe has played an increasingly relevant role in waste management by effectively recovering waste materials. The recovery of waste in the cement industry referred to 'co-processing', is the optimum way of recovering energy and material from waste. For example, use of alternative raw materials to replace the traditional raw materials, such as clay, shale and limestone. Examples of these alternative materials include contaminated soil, waste from road cleaning and other iron-, aluminum-, and silica-containing waste. Industrial by-products such as blast-furnace slag (a by-product of the iron manufacturing process) and fly ash (residues generated from coal combustion) can be used to partially substitute clinker in cement. In Europe, an additional 8.3 million tons of clinker were substituted with by-products in 2010 compared to 1990. Lower-clinker cement have become a widely-used hydraulic binder in the production of

concrete for specific applications, such as infrastructure in chemically aggressive environments [13].

Co-processing offers a win-win-win solution for society, as it is beneficial to the environment, is cost competitive, and reduces the consumption of natural resources. In addition, the industry contributes to the reduction of landfills (it should be noted that landfills emissions consist of about 60 percent methane, a gas with a global warming potential which is 21 times higher than CO₂) and reduces the need for solid waste incineration in Europe. The increased use of industrial by-products represented a reduction of around 7.2 million gross tons of CO₂ in 2010 compared to 1990 levels (9.8%). Since 1990 Lafarge Holcim has reduced the amount of clinker in products by 14 percent with alternative mineral components. In 2016, the alternative raw material substitution rate is 10.5% [14].

Existing PT Semen Indonesia has been developing "Blended Cement program" to reduce the use of clinker by utilizing external waste from other industries for alternative raw material. They have utilized the B3 (hazardous and toxic materials) waste from other industries, such as fly ash and bottom ash from the coal-fired power plant, purified/crude gypsum from the petrochemical industry and copper slag from copper industry. Waste producer industries benefit from the practice because it reduces landfill and B3 waste management activities, which often cause environmental problems. Instead, cement plant is treating the waste with high standards to be used for combustion in the production process. External hazardous and toxic waste is treated through co-processing with combustion at high temperatures (1400 °C). The combustion process is able to decompose content of heavy metal waste into oxides. This process can improve the quality of cement produced and will not harm the environment. The blended cement that has been produced by Semen Indonesia included PPC (Pozzolana Portland Cement), SBC (Special Blended Cement) and PCC (Portland Composite Cement). Waste utilization consumed an average of 8% per year. In addition to reducing the consumption of clinker, utilization of alternative raw materials could reduce CO₂ emissions and energy efficiency. In 2015, the cement mix project is able to reduce emissions of 79,758 tons of CO₂, higher than the previous year 44,261 tons of CO₂. Results of emission measurement at Tuban Plant since 2009 until the end of 2015 showed a decrease in CO₂ emissions to 11.2% [15].

3) Development of Alternative Fuel

Use of fuel energy sources in the cement industry reached 15-20% of total production costs. The sources of energy are from fuel, coal and power, which are non-renewable energy. Around 40% of emissions related to

the clinker production are linked to the fuel combustion. Efforts to reduce CO₂ emissions in this part of the process have resulted in an increase of the usage of alternative fuels (such as waste tires, sewage sludge, plastics, waste oils and biomass) or an optimization of the energy efficiency of the kiln. A major advantage of the energy recovery from waste is that the non-combustible ash fraction is recovered as a raw material. Another reason why using waste as an alternative fuel when producing cement is good for the environment is that it preserves non-renewable fossil fuels, such as coal or oil, and it also lowers the region's dependence on such fuels. Every year the cement industry in the Europe saves the equivalent of about 7 Mt of coal. The cement industry in Europe has significantly increased its use of alternative fuels resulting in a reduction of 15.6 million tons of CO₂ emissions. Having increased from 3 percent in 1990 to 31 percent in 2010, resulting in a total usage of 9.2 tons of waste, the cement industry in Europe uses by far the highest amount of alternative fuels in the world, followed by North America with a 13 percent substitution rate [13].

The largest Lafarge Holcim cement plant in France developed a new line with 80 percent of the fuel used in the cement plant comes from alternative sources. This equates to savings of 100,000 tons of CO₂ emissions annually and reduces the amount of waste going to landfill by 60,000 tons per year. In 2016, 15 percent of Lafarge Holcim's thermal energy demand for clinker production was covered by alternative fuels, reducing CO₂ emissions by 8 million tons [14].

As the development of alternative fuel, PT Semen Indonesia develops utilization of RDF (Refuse Derived Fuel) and biomass for production process while reducing CO₂ emissions. PT Semen Indonesia has built municipal solid waste treatment facilities at Ngipik landfill, Gresik regency. They process municipal solid waste into the alternative fuel of RDF in the production process of slag burning. RDF is capable of producing a calorific value of 3500-4000 kcal/kg and reduces the emission of 10,000 tons of CO₂ per year. This initiative also contributes to the solid waste reduction of 650 cubic meters or 217 tons/day. PT Semen Indonesia also reuses agricultural product waste or biomass as an alternative fuel in the early combustion process. This initiative could reduce 150,000 tons/yr of CO₂ emissions. The waste includes rice husk, sawdust and tobacco waste. In addition, to increasing energy efficiency and reduce emissions, use of biomass can provide a stimulus for the economy of the local community. Volume of alternative fuel utilization at Tuban plant is 83,991 tons. The portion of alternative energy utilization has now reached 5-8% of the total energy needs, which usually took more than 2 million of

coal per year. This quantity can increase 4% efficiency in energy use. In 2015, the intensity of energy consumption per cement products is 2.15 GJ/tons of cement, lower than the previous year 3.34 GJ/ tons of cement [15].

4) *Waste Heat Recovery Power Generation (WHRPG)*

Waste Heat Recovery Power Generation (WHRPG) program is the utilization of exhaust gases from the combustion process to generate power or electricity (Fig. 2). WHRPG is a proven technology, but until now WHRPG uptake has been limited except in China. China has become the market leader in WHRPG installations. Regulatory measures and lower capital costs have been key factors behind China's success in mainstreaming WHRPG technology [16]. The Organic Rankine Cycle (ORC) systems have been widely used to generate power from biomass systems in Europe. The Rankine cycle is a thermodynamic cycle that converts heat into work. In Europe there are more than 250 cement plants and the theoretical ORC potential has been estimated in more than 500 MW [17]. With the festive commissioning of the waste heat power plant, the Rohrdorf cement company (Germany) can claim that it runs the most environmentally friendly and, at the same time, the most energy efficient cement plant in the world. Based on a new process, fresh superheated steam is produced by means of the heat energy of the waste gases. This steam drives the turbine that produces the electric current via the generator. At least one-third of the power requirement of the entire plant is met by the electricity produced there. The waste heat power plant is to produce a total of about seven megawatts of electric power. 12,000 tons of fossil fuels will be saved and, consequently, the emission of CO₂ will be reduced by 30,000 tons/year [13]. Development of WHRPG in China leaped forward in step with rapid cement industry development. By the end of 2012, 739 waste heat power systems were operating, with a total installed capacity of 6,575 MW [16].

The WHRPG project has been implemented at Indarung Padang plant and Tuban plant, PT Semen Indonesia with a capacity of 8.5 MW and 30.6 MW, respectively. This program can reduce the cost of power from PLN and reduce CO₂ emissions. The estimated efficiency of WHRPG implementation in Tuban can save power costs up to Rp. 120 billion per year and reduce consumption of power from PLN by 152 million kWh per year, and also will reduce emissions of CO₂ by 122,000 tons per year as compared to the use of conventional energy [15].

5) *Development of Green Product*

Innovation to create new products that are environmentally friendly with attention to the health and safety of customers are necessary. Although PT Semen Indonesia is also used hazardous waste from other

industries, it can still produce environmentally friendly cement products in good quality. The opportunity of reducing emissions is not limited solely to the cement production process but also lies in the whole life cycle of downstream products, namely concrete. Porous concrete is one of the “green products” of Semen Indonesia that is able to absorb the surface water and channeled it into the ground. Paving blocks with high porosity are suitable to be used for the road surface, the home yard, and parking area. The advantage in applying this porous concrete is increasing the deposit of groundwater and prevents the risk of flooding. Another green product is flash concrete that dried quicker than ordinary cement then making the roadwork faster [15].

Concrete can contribute significantly to reduce CO₂ emissions as concrete construction offers a higher energy saving potential compared to other construction materials. This is due to the high level of insulation offered by concrete which means that the indoor temperature remains stable even when there are fluctuations in the temperature outside. The saving potential provided by concrete buildings resulting from the production of cement. By combining all of the above, the thermal mass potential of concrete can be maximized and allow for the construction of low energy concrete buildings that reduce energy usage from an average of 200-150 kWh/m² to 50 kWh/m², or even to zero emission. In relation to civil engineering, concrete is able to withstand moisture and varying weather conditions, as well as mechanical wear and high temperatures. It is commonly used in flood-prone areas due to its resilience to flooding, in tunnels due to the benefits it offers in terms of fire safety, in power plants due to the provision of safe and secure storage of potentially dangerous fuels and in water treatment, run-off catchment and water distribution systems which provide fresh water. Concrete pavements can reduce the fuel consumption of heavy trucks by up to 6 percent, by reducing the rolling resistance between the road and the truck as concrete pavements offer a smoother surface with fewer undulations than asphalt pavements. Furthermore, the total life cycle costs of concrete are lower than those of asphalt. The other new concrete applications have also been developed, including; photo-catalytic concrete, (can reduce air pollution by 25-60%), pervious concrete (for better soil conservation by capturing rainwater), and insulated concrete formwork (for a more cost-efficient, quicker to build and energy-efficient structure). The innovation of cement and concrete industry to material recovery and recycling has led to a reduction in construction and demolition waste, and resulted in a recycling rate of ~46 percent, implying a reduction of ~250 million tons of all the waste landfilled in Europe. As a result, in Europe (excluding the UK) on average 8

percent of aggregates are recycled and recovered aggregates [13].

6) Other Development

All development that has been applied in existing PT Semen Indonesia plant will be adopted in a new plant at Rembang with some innovations. For example the innovation of dust emission and noise reduction to minimize the impact of cement operation and to create a balance of the natural and social environment by replacing Electrostatic Precipitator (ESP) device with main bag house filter. ESP device has the weakness in the safety interlock that will shut off the system when the rotary kiln generates gas, then resulted in high CO₂ gas. The dust that is not captured by the ESP will look like thick smoke over the stack. All the equipment installed at Rembang Plant reduced dust emissions to below 30 mg/Nm³, even when the rotary kiln operation is being offset. Development of long belt conveyor from quarries to processing plant will reduce dust emissions significantly. In addition to dust control, new Rembang plant will operate Wirtgen and Vermeer equipment to minimize the impact of noise during quarrying activities. In contrast to the blasting method, the supporting equipment for limestone quarrying process does not cause noise. Quarrying methods will be used a Zero Run Off concepts, in which the ground water is carefully managed to prevent the discharge from the mine area, then the amount of ground water is increased. Rembang plant is equipped with the Variable Frequency Drive (VFD) technology on the application of large motors, which is claimed to be able to save electricity consumption up to 60 percent. The decline in electricity consumption also indirectly reduces greenhouse gas (GHG) emissions. To manage water use, Rembang Plant is equipped with technology and mechanism of surface water utilization from the reprocessing of gray water. The processing is carried out at the water treatment plant (WTP) through the process of dissolved air flotation (DAF) and ultrafiltration (UF), which is more efficient in chemicals and electricity consumption [15].

In Europe, notable improvements have been achieved in other areas such as NO_x, SO_x and dust emissions reduction. From 1995 to 2010, the European cement industry reduced NO_x emissions by a total of 20 percent, which represents the emissions of 870,000 cars in one year, and SO_x emissions by 34 percent [13]. In France, to reducing freshwater withdrawal in its cement segment, Lafarge Holcim operates on a zero “process-water discharge” and uses recycled water in its batching operations over freshwater, wherever possible. In 2016, they withdrew 356 liters of freshwater per ton of cement. In its quarrying operations, they harvest and stores rainwater in large onsite catchment areas for production

use. The system is designed to allow excess rainwater to bypass the catchment area and leave the site as uncontaminated stormwater run-off. Projects include a storm water project at Beenleigh aggregate quarry resulting in increased rainwater holding capacity and real-time remote access water use monitoring [14].

C. Assessment of the Green Technology in Cement Industry

Based on the comparison that has been discussed in section IV.B and summarized in Table 1, green technology that has been applied in existing plant of PT Semen Indonesia and new installations that will be operated in Rembang plant have equal quality with the existing technology in European cement industry. All new developments in European cement industry are also developed by PT Semen Indonesia qualitatively. Quantitatively (based on some parameter for example total rehabilitated area, CO₂ emissions, etc.), green technologies in PT Semen Indonesia are better than selected cement plant in Europe (for example Lafarge Holcim) in case of reclamation and biodiversity after quarrying, use of alternative fuel and Waste Heat Recovery Power Generation (WHRPG). Meanwhile, in case of alternative raw material substitution rate and development of green product, technologies in PT Semen Indonesia are still left behind with Europe.

Total direct green-house gas (GHG) in 2015 at Tuban plant is 656 kg CO₂ per ton cement product [15]. This value is equal to average gross CO₂ per ton cement product of China and lower than the rest of Asia and North America (Fig. 3) [13]. Meanwhile, the world average value is 657 kg CO₂ per ton cement product. Brazil's cement industry is among the most advanced in the world. It had average CO₂ emissions as low as 592 kg CO₂ per ton of cement, ahead of Europe, China, Japan, Australia and New Zealand. Fig. 4 shows the comparison of gross CO₂ emissions between Lafarge Holcim and PT Semen Indonesia at Tuban plant. Lafarge Holcim is one of the most carbon-efficient cement companies in the world. In 2016, their cement contained an average of 72 percent clinker, and gross CO₂ emissions per ton of cement were 603 kg/ton, a reduction of 24 percent against the 1990 benchmark [14]. The new plant of PT Semen Indonesia in Rembang is expected to reach these values.

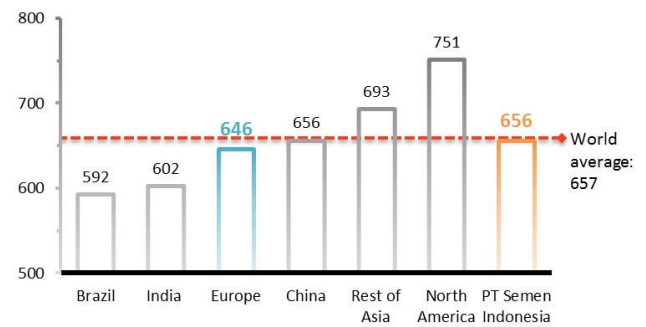


Figure 3. Total direct or gross CO₂ emissions (kg CO₂/ton cement).

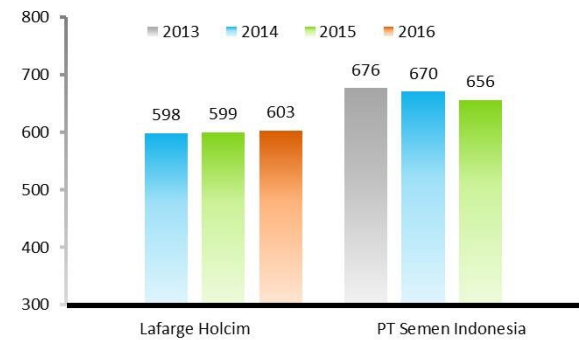


Figure 4. Comparison of gross CO₂ emissions between Lafarge Holcim and PT Semen Indonesia (kg CO₂/ton cement).

Even though the comparison of green technology between PT Semen Indonesia and European cement industry in this work is not a straightforward assessment due to the various factor influences and limited data available. But, from the results, as discussed above, we can conclude that cement factory that will be operated in Rembang by PT Semen Indonesia is applying a modern environmentally friendly plant with the latest technology and lower CO₂ emissions than some cement factory in Asia (more efficient use of water, chemicals, fuel, and electricity). Then, these technologies will become a pioneer and a standard for the construction of a new cement industry in Indonesia. The operations of the Rembang plant will cause positive and negative impacts on the environment and surrounding communities. To minimize the negative impacts and enhance positive impacts, a study on environmental and social impact has been conducted.

D. Direct Impact to Local Community

The advantage of the cement factory operation to the development of local communities is invaluable as it also develops local wisdom. The positive impact of plant development began to be enjoyed by communities, including job opportunities, serves as the backbone for local economies by promoting a local industrial base, education and socio-economic programs. The presence of PT Semen Indonesia operation and local suppliers managed to employ the surrounding community who

support operational activities. Construction of the new plant in Rembang is also expected to give a socio-economic contribution to the communities around the area of operation. Until the end of 2015, total local suppliers of PT Semen Indonesia reached 313 companies. Total plant employees reached 3,282 people, who originated from Rembang was 1,009 people (approximately 30%) [15].

PT Semen Indonesia managed to change the post-quarrying land with an area of 8 hectares of clay into a “source of life” for communities around Tuban Plant. They built retention basin (reservoirs of surface water) that has been utilized by 40 farmers in fish farming with floating cage system. In addition, the retention basin has been used by residents around the plant to irrigate of rice fields during the dry season. To produce alternative fuels, PT Semen Indonesia has built partner with local biomass suppliers. They use agricultural product waste such as rice husk, cocopeat, tobacco waste and sawdust in order to reduce the use of fossil fuels. This pattern has had a positive impact; it develops 11 local suppliers in the area around the plant operations and each local supplier has been able to employ 15-20 workers, then providing extra income for farmers, owners of rice husk mill and sawmills [15].

As for the community around the operational areas of PT Semen Indonesia who have a strong will in entrepreneurship, the company has provided support through corporate social responsibility (CSR) programs. This program focuses on; improving competence through education programs (include scholarships, training and skills of the community, as well as providing learning facilities), environmental programs (include the development of Green Secorejo and limestone post-quarrying reclamation in Tuban Plant), socio-economic programs (include assistance for education, sports, arts, health, public facilities and infrastructure, as well as assistance for natural disasters), coaching and mentoring the partners. The partner business sectors include trade, culinary, agribusiness, creative industries, to the various other small industrial sectors.

In Europe, the production of cement provides an estimated 61,000 direct skilled jobs, and up to 3-5 times as many indirect jobs, translating into a total of ~245,000 to ~365,000 jobs related to cement production. In addition, over 305,000 people are employed in concrete production. The European cement industry also contributes to the prosperity of local communities. In France, over 50 percent of French cement plants are located in municipalities with less than 5000 inhabitants. In addition, the hiring of local people contributes towards maintaining positive contact with communities. Many companies work with communities at regional and local

level offering educational programs. Companies also develop community collaboration plans to foster activities such as school visits, create foundations to support local community projects or partner with local NGOs to support the underprivileged [13,14].

IX. V. CONCLUSION

The latest developments of green technologies in European cement industry and the existing plant of PT Semen Indonesia including new installations in Rembang plant were described and compared. Qualitatively, all new developments in European cement industry are also developed by PT Semen Indonesia. Quantitatively, green technologies in PT Semen Indonesia are better than selected cement plant in Europe in case of reclamation and biodiversity after quarrying, use of alternative fuel and Waste Heat Recovery Power Generation (WHRPG). Meanwhile, in case of alternative raw material substitution rate and development of green product, technologies in PT Semen Indonesia are still left behind with Europe. Total gross CO₂ per ton cement product of existing plant PT Semen Indonesia is lower than the rest of Asia and North America.

Cement factory that will be operated in Rembang by PT Semen Indonesia is applying a modern environmentally friendly plant with the latest technology and a higher efficiency than another cement factory in Asia (more efficient use of water, chemicals, fuel and electricity). Then, these technologies will become a pioneer and a standard for the construction of a new cement industry in Indonesia. The advantage of the cement factory operation to the development of local communities is invaluable as it also develops local wisdom.

Acknowledgment

The author would like to thanks the Henan Government Scholarship for the financial support of the study in NCWU, Zhengzhou, China.

References

- [1] P.P. Nainggolan, “Maritime axis policy and its international implications”, *Politica* vol. 6, 2015.
- [2] M.S. Imbabi, C. Carrigan and S. McKenna, “Trends and developments in green cement and concrete technology”, *Int. J. Sustain. Built Environ.*, vol. 1, pp. 194–216, 2012.
- [3] E. Benhelal, G. Zahedi, E. Shamsaei and A. Bahadori, “Global strategies and potentials to curb CO₂ emissions in cement industry”, *J Clean Prod*, vol. 51, pp. 142–161, 2013.
- [4] Popescu, M. Muntean and J.H. Sharp, “Industrial trial production of low energy belite

- cement”, *Cement & Concrete Composites*, vol. 25 pp. 689–693, 2003.
- [5] N. Rodriguez, M. Alonso, J.C. Abanades, G. Grasa and R. Murillo, “Analysis of a process the capture the CO₂ resulting from the pre-calcination of the limestone feed to cement plant”, *Energy Procedia*, vol. 1, pp. 141–148, 2009.
- [6] B. Cazacliu and A. Ventura, “Technical and environmental effects of concrete production: dry batch versus central mixed plant”, *J Clean Prod*, vol. 18, pp. 1320–1327, 2010.
- [7] J.A. Moya, N. Pardo and A. Mercier, “The potential for improvements in energy efficiency and CO₂ emissions in the EU27 cement industry and the relationship with the capital budgeting decision criteria”, *J Clean Prod*, vol. 19, pp. 1207–1215, 2011.
- [8] Valderrama, R. Granados, J.L. Cortina, C.M. Gasol, M. Guillem and A. Josa, “Implementation of best available techniques in cement manufacturing: a life-cycle assessment study”, *J Clean Prod*, vol. 25, pp. 60–67, 2012.
- [9] R. Kikuchi, “Recycling of municipal solid waste for cement production: pilot-scale test for transforming incineration ash of solid waste into cement clinker”, *Resources, Conservation and Recycling*, vol. 31, pp. 137–147, 2001.
- [10] E. Mokrzycki, A.U. Bocheńczyk and M. Sarna, “Use of alternative fuels in the Polish cement industry”, *Applied Energy*, vol. 74 (1–2), pp. 101–111, 2003.
- [11] M. Prisciandaro, G. Mazziotti and F. Veglio, “Effect of burning supplementary waste fuels on the pollutant emissions by cement plants: a statistical analysis of process data”, *Resources, Conservation and Recycling*, vol. 39 pp. 161–184, 2003.
- [12] E. Gartner, “Industrially interesting approaches to “low-CO₂” cements”, *Cement and Concrete Research*, vol. 34 (9), pp. 1489–1498, 2004.
- [13] R. Baeza, Micaela Martelli and Rafael Rilo, “The cement sector: a strategic contributor to europe's future“, *The Boston Consulting Group (BCG)*, 2012.
- [14] Lafarge Holcim, Sustainability report 2016.
- [15] PT Semen Indonesia, Sustainability report 2015.
- [16] International Finance Corporation (IFC), *Waste Heat Recovery for the Cement Sector: Market and Supplier Analysis*, 2014.
- [17] D. Forni, F. Campana and D. Di Santo, Innovative system for electricity generation from waste heat recovery, *ECEEE Industrial Summer Study Proceedings*, pp. 393-403.

Technology of Catalytic Cracking Pyrolysis for Liquid Fuels Production from Waste Tires Using Acid Zeolite and Silica Catalysts

¹Rizka Nurdianti, ²Reza Armansyah, ³Hilman Saputra, ⁴Erwana Dewi

^{1,4}Chemical Engineering Department State Polytechnic of Sriwijaya Palembang, South Sumatera, Indonesia

²Electrical Engineering Department State Polytechnic of Sriwijaya Palembang, South Sumatera, Indonesia

³Accounting Department State Polytechnic of Sriwijaya Palembang, South Sumatera, Indonesia

¹rizka.nurdianti23@student.polsri.ac.id

²Aimanfalah06@yahoo.co.id

³Hilmansaputra32@gmail.com

⁴Erwanadewi@gmail.com

ABSTRACT

Tires made from rubber is one of the types of polymers (Polystyrene), which can be recycle for processing of waste tires into energy that is by means of cracking process. This process takes place at high temperature so it takes a catalyst. Catalyst acid zeolite and silica was able to increase the process of pyrolysis by means of lowering the temperature and time of decomposition, so obtained results in the form of liquid fuel. Method in the writing this scientific paper is a research method which consists of stages the design of equipment, research and analysis phase of the product. At the beginning of the study, the variables vary is the weight of the catalyst with the aim to get the weight of the optimum catalyst that produces the maximum product. From the weight variation the catalyst is done (5:1, 5:2, and 5:3) the volume of product that most i.e. in the ratio of raw materials and catalyst 5:2. At later stages done temperature variations in the ratio of raw materials and optimum catalyst (5:2) i.e. 450, 550, and 650°C. From the results of the experiment produced optimum temperature i.e. 550°C with product volume 220 ml. Based on the results of the analysis of such product approaching nature physical on diesel fuel with the density of the product of 0.815-0.88 gr/ml, and the heat value of the product is at the range 10496,18-14227,93 cal/gr.

Keywords : Waste Tires; green technology; liquid fuel; catalysts; cracking pyrolysis.

I. INTRODUCTION

Energy is a component that humans always need to meet their daily needs because almost all human activities depend on the availability of energy. It cannot be denied that the current energy needs are increasing as the population grows and technological progress. Given the fact that we are still dependent on non-renewable energies, such as petroleum derived from fossil energy, this results in the depletion of energy availability because the population is directly proportional to the energy needs.

In recent years, energy is a crucial issue in the world. Increased energy demand caused by population growth and depletion of sources of energy reserves, especially world oil and some emissions from fossil fuels put

pressure on each country to produce and use renewable energy immediately. In addition, the increase in world oil prices to reach 100 U \$ per barrel is also a serious reason that affects many countries in the world, especially Indonesia [1].

To reduce dependence on fossil fuels, the government has issued Presidential Regulation No. 5 of 2006 on national energy policy to develop alternative energy sources in lieu of fuel oil. One innovative that can be developed to overcome this problem is by utilizing waste tires that can be converted into fuel [2].

Indonesia is one of the largest rubber-producing countries in the world, in 2010 producing 2.5 million

tons of rubber, mostly from people's plantations. Badan Pusat Statistik (BPS) said in 2013 rubber production in Indonesia reached 3 million tons. In Indonesia, rubber is one of the leading agricultural products because it supports many of the country's economy. With the increase of Indonesian rubber products, the increase in the tire industry whose main material is rubber also increased. Along with that the existence of used tires that have been used more and more are of course a problem in environmental pollution.

The use of environmentally minded tires has received much attention. Efforts to destruction by burning the usual way it produces harmful pollution impact because it adversely affects human health. If thrown away, tires

will certainly pollute the surrounding environment considering the old tires cannot decompose easily biologically [3].

Therefore, it is necessary to do a business that can turn waste tires into something more useful. Rubber based tires are one type of polymer (Polystyrene). Polystyrene cannot be easily recycled so Polystyrene waste treatment must be done properly so as not to harm the environment. Polystyrene is a molecule that has a mild molecular weight, formed from a styrene-like monomer. Excess Polystyrene is light, hard, heat resistant, slightly stiff, not easily broken, and non-toxic. This cracking process takes place at high temperatures, so a catalyst is required to lower the temperature and shorten the processing time that will eventually be produced by fuel oil [4].

Thus, the process of cracking Polystyrene is in addition to reducing waste tires that can pollute the surrounding environment can also be used as a raw material for making energy alternative. From the above background, the authors are interested to conduct research on the issue of increasing tire waste as raw material for the manufacture of alternative fuels.

II. METHODS

A. Time and Place implementation

The implementation is done in the Chemical Engineering Laboratory of the State Polytechnic of Sriwijaya.

B. Equipment Design

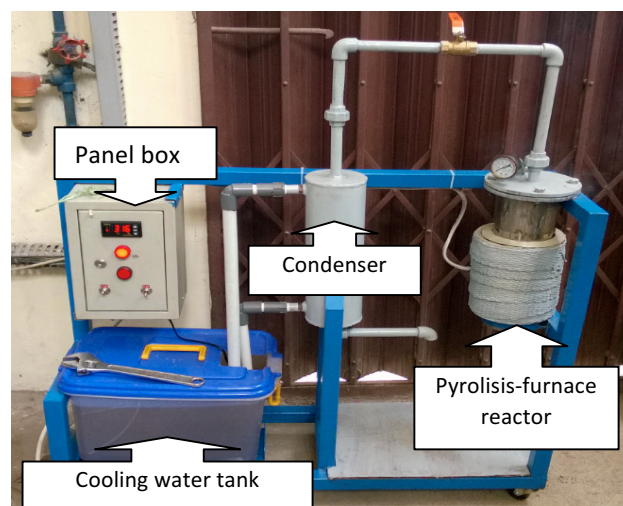
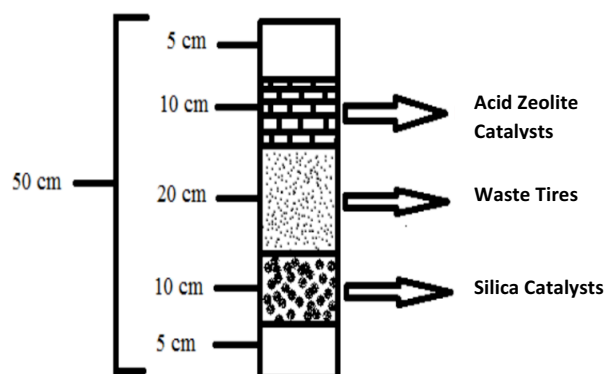


Figure 1. The Series of Pyrolysis Equipment with Catalytic Cracking Technology

Detailed explanation of the tool components:



1. Construction of pyrolysis furnace reactor is a stainless steel-based reactor covered by heater. The pyrolysis furnace reactor has a length of 35.5 cm and a width of 10 cm. The material configuration inside the reactor is the upper part is the acid zeolite catalyst, the middle part is the used tire and the bottom is a silica catalyst.
2. Condenser construction is cylinder and vertical coolant reactor and spiral inner flow pipe. The condenser has a length of 35.5 cm and a width of 12 cm.

- Construction of cooling water container is a plastic-based container with a length of 37 cm, 30 cm wide and 23 cm high.
- Optimum temperature this equipment is 550°C.

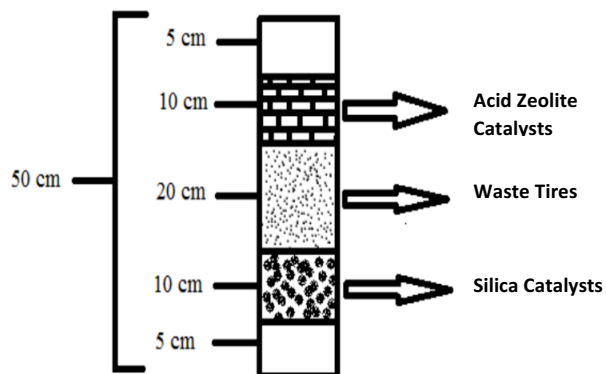


Figure 2. Material Configuration in the Reactor

C. Methods of Research

Tools and Materials

The Materials used: waste tires (5 kg), Acid Zeolite catalyst (150 grams), Silica catalyst (150 gram) and aquadest (1 liter). The tools used : A set of catalytic cracking reactor (1 kg capacity), termosetting, scissors, viscometer, piknometer, flash point apparatus and scale.

Procedure

- Cut small pieces of rubber tires with size 1 cm x 1 cm
- Considering rubber tires that have been cut as much as 1 kg
- Weighing the catalyst of acid zeolite and silica according to variation
- Insert the materials into the reactor by placing the silica catalyst placed at the lower end of the reactor, while the acid zeolite catalyst is placed at the top end of the reactor.
- Conducting the pyrolysis process by heating the reactor using a heater with a predetermined temperature variation.
- Steam formed from the top of the reactor to the cooling back through the heat-resistant hose, while the wax that comes out through the bottom of the reactor is accommodated in a beaker glass
- The experiment is considered to be over if no more steam is flowing or wax is dripping.
- The resulting liquid product will be analyzed its physical properties include density test, viscosity test and flame point test.

Treatment and Research Design

This research stage is at the same time the stage of operation of the equipment. Material used in the form of scrap tires that have undergone the process of reducing

the size of which will then be done pyrolysis process using acid zeolite and silica catalyst. This research stage was done 7 times experiment with variation of catalyst weight, temperature, and time. The treatment and research design of liquid fuel from used tire rubber by using acid zeolite and silica catalyst as follows:

| R u n | Temperature (C) | Weight of Tire waste (gr) | Weight of Silica Catalyst (gr) | Weight of Acid Zeolite Catalyst (gr) | Time (hours) |
|-------------|--------------------|------------------------------------|---|--|-----------------|
| 1 | 450 | 500 | 500 | 100 | 2 |
| 2 | 450 | 500 | 500 | 200 | 2 |
| 3 | 450 | 500 | 500 | 300 | 2 |
| 4 | 550 | 500 | 500 | 200 | 2 |
| 5 | 650 | 500 | 500 | 200 | 2 |
| 6 | 550 | 500 | 500 | 200 | 1 |
| 7 | 550 | 500 | 500 | 200 | 3 |

III. FINDINGS AND ARGUMENTS

In this research produced a prototype used to produce liquid fuel with used tire rubber as the main raw material. In this study the desired product is a liquid product used as a liquid fuel.

At the beginning of the study, the variables varied were the weight of the catalyst in order to obtain the optimum catalyst weight which produced the maximum product. From the variation of catalyst weight (5: 1, 5: 2, and 5: 3) the highest volume of the product is in the ratio of raw material and 5: 2 catalyst which produce the product as much as 82 ml. This is because at the ratio of 5: 1 the number of catalysts used is less optimum because of the considerable weight difference between the catalyst and the raw material, whereas at a ratio of 5: 3 the amount of catalyst is quite large / exceeding so that the vapor that leads toward the condenser is blocked by the pile A large amount of catalyst. At a ratio of 5: 2 the role of this catalyst is to increase the product conversion.

In the next stage, temperature variations in the ratio of raw materials and optimum catalyst (5: 2) are 450, 550, and 650°C. From the experiment result, the optimum temperature is 55 °C with 220 mL product volume. At 450°C the results obtained are not as much as at 550°C because at this temperature there is still some unconverted tire raw material and still in the form of

small chunks. From result of analysis of liquid fuel product got result which tabulated in table below:

Based on the analysis on the fuel product in terms of density, flash point, and calorific value, the product approaches the physical properties of diesel fuel. The density of the analyzed product is in the range 0.8332-0.8688 gr/ ml close to density in diesel fuel that is 0.815-0.88 gr/ ml. But for the flash point is still below the value of the flash point solar. This is because there are still impurities in the product that cause the flame to be faster. On the calorific value of the product is in the range 10496,18-14227,93 kal/ gr is also close to the calorific value of diesel fuel. By reviewing the physical properties of this product, it can be concluded that the most dominant component in the product is solar, but there are other components such as paraffin, olefin, etc [4].

The acquisition of these diesel fuel products could potentially cope with the fuel crisis as well as to tackle the more widely used tire wastes. By utilizing this technology, for the foreseeable future diesel production raw materials can be easily obtained without worrying about the fuel crisis.

IV. CONCLUSION

Utilization of used tires as fuel oil producers certainly can potentially in the handling of fuel crisis besides can reduce the accumulation of tire waste in South Sumatra, especially in Palembang City. The physical properties of the fuel produced close to the physical properties of the diesel fuel so that it can be utilized as a substitute for diesel fuel sourced from petroleum

REFERENCES

- [1] Steel, Alpen. 2017. Renewable Energy, (online), (<http://www.alpensteel.com/>)
- [2] Sertiarto, R. Haryo Bimo. 2015. Penggunaan Sumberdaya Alam Hayati Terbarukan Berbasis Limbah Untuk Mencegah Krisis Energi (online), (<http://u.lipi.go.id/1441856041>).
- [3] Bukit, Nurdin and Erna Frida. 2011. Pengelolaan Ban Bekas Berwawasan Lingkungan Menjadi Bahan Bamber pada Outomotif. Teknologi Indonesia LIPI, (34): 123.
- [4] Damayanthi, Reska and Retno Martini. Proses Pembuatan Bahan Bakar Cair dengan Memanfaatkan Limbah Ban Bekas Menggunakan Katalis Zeolit Y dan ZMS 5.Semarang: Diponegoro University.

- [5] PT. Artha Teknindo Artech. 2011. Mengolah Ban Bekas Menjadi Energi,(online),(www.artech.co.id)
- [6] Buchori, Luqman and Widayat. 2007. Pembuatan Biodiesel dari Minyak Goreng Bekas dengan Proses Catalytic Cracking, Teknik, 2 (28): 83-93.

Implementation of Spatial Hybrid Concept in Sustainable City Growth in Urban Sprawl Periphery

Case Study: Border Area Surabaya with Sidoarjo Regency

Darmansjah Tjahja Prakasa, Suko Istijanto
Architecture Department, Faculty of Engineering
The University of 17 Agustus 1945 Surabaya,
Surabaya, Indonesia
darmansjahhp@yahoo.com; suko@untag-sby.ac.id

ABSTRACT

The growth of a city is closely related to population growth and urbanization process which will result in the increasingly difficult population to live in the city center. Intensive urban growth (inner city compaction) becomes less effective which results in extensive urban growth (out-of-town development). This situation triggered the acceleration of urban development towards the periphery. The city grew broader and seemed always unbounded. The strongest characteristic of suburban growth is sprawl growth. The growth process towards the outskirts of the city or Urban Sprawl has negative impacts (Polidoro, et al., 2011), among others uneven distribution of the population, decreased agricultural land area, the emergence of traffic congestion and discontinuity. Findings on how to overcome sprawl in the suburbs have been done, but still do not find the best solution to mitigate these negative impacts (Setioko, 2009).

The uniqueness of the suburbs is in relation to the dependence on the metropolitan centers (Delik Hudalah, et al 2007). The city center is understood as an established region with intensive growth (compaction). Centered compaction tends to be seen as one way to achieve sustainable urban forms (Stan A, 2013). On the other hand, rural areas already have a clear form of identity typically dominated by agricultural land. While urban-periphery is right between the city center and the rural areas with a vagueness of form. The above conditions indicate that the urban periphery is always viewed in a bad position, while in reality the existence of the border area from time to time still exist and survive against the existing conditions. This can lead to hypotheses as well as a new understanding that border areas can have meaning or positions as sustainable cities, although initially viewed as urban sprawl.

Sustainable urban development is defined as an effort to improve the quality of life of the city and its citizens without causing a burden for future generations due to the depletion of natural resources and environmental degradation (Urban 21, Global Conference in Berlin, July 2000). The concept of spatial hybrid (Gordon and Richardson, 1998) in detail can be indicated as a sustainable urban development that overcomes urban sprawl problems in urban periphery.

Specifically selected cases of Surabaya-Sidoarjo suburban areas as testing factors associated with suburban areas as the application of the concept of spatial hybrid that makes the periphery is still sustainable. The selection of border areas of Sidoarjo Regency with Surabaya City in this study because the readiness of the condition of the land there is more possible than the other Surabaya edge.

Keywords: Urban Sprawl, Urban Periphery, Spatial Hybrid, Sustainable Urban Development

I. BACKGROUND

The city always grows and develops along with the development of socio-cultural, economic and political life that became the basis of its background. The development of the city is a manifestation of the work of the construction of human thought both in the level of adaptation to the environment and from the side of the arrangement. The urban community with a certain background from the traditional to the modern lifestyle will affect the changes in urban formation (Tallo, et al, 2014).

The growth of a city is closely related to population growth and urbanization process. The growing population and urbanization will make it more difficult to live in the city center. Intensive urban growth (inner city compaction) becomes less effective which results in extensive urban growth (out-of-town development). This situation triggered the emergence of accelerated development of the city towards the periphery. The city grew broader and seemed always unbounded. The most powerful feature of peripheral growth is sprawl growth. Sprawl growth is present in both developed and developing countries. Various findings on how to overcome sprawl in the suburbs have been done, but still find no solution (Setioko, 2009).

The suburbs (Winarso, et al, 2015) have the definition of a transition zone located on the outskirts of the city edges. This transition zone has non-rigid, spreading boundaries and displays the diversity of dynamic land uses. The transition zone has a mix of rural and urban characteristics. The process of growing towards the suburb or Urban Sprawl, gives a negative impact. Negative impacts (Polidoro, et al, 2011) include uneven distribution of the population, decreased agricultural land area, the emergence of traffic congestion and discontinuity.

The peri-urban areas generally move away from the metropolitan core. Peri-urban becomes a term because it is characterized by the transformation of the socio-economic structure of much of the countryside into more urban activities, while creating both spatial work and segregation. Uneven development in suburban areas has the potential to create social conflict between

communities. Suburban areas are usually not solid, it can also be defined as rural cities (Adell, 1999).

The above exposes reveal the uniqueness of the peri-urban in relation to the dependence on the metropolitan centers (Delik Hudalah, et al. 2007). The city center is understood as an established region with its intensive growth (compaction). Centered compaction tends to be seen as one way to achieve sustainable urban forms (Stan A, 2013). The New Urbanism movement asserts that "compact city" is the only model accepted as sustainable urban development. The consensus that a compact urban form is offered for a sustainable future (Williams and Burton, 1999). The city of the future is the place where something fragment will once be broken and then it is forming "recomposed" (Rosi, 1984). On the other hand the rural area is also a form of territory that is clearly the typical identity as the dominance of agricultural land. While the urban-periphery is right between the city center and the countryside with a vagueness of form (Atipikal). Urban periphery occupies the border area of the city which is seen as an instrument of social order that divides and regulates contacts between specific classes or groups (Gheorghiu Merklen, 2005).

Urban periphery is positioned on the condition of the worsening region due to sprawl. While another point of view, sprawling urban growth will be formal and become spatial hybridisation, (Gordon and Richardson, 1998). At the end of the decade of the twentieth century, the central term tends to fade as a concept of aligning with the new (Stan A, 2013). The conditions indicate that the periphery urban position is always viewed in a bad position, while in reality the existence of the border area from time to time still exist and survive against the problems. This subject can generate hypotheses as well as a new understanding that border areas can have meaning or position as sustainable urban development, although initially viewed as something bad due to urban sprawl.

Sustainable urban development is in principle consistent with the notion of sustainable development, where space perspective is focused on urban space. As stated in Urban Sustainability (Berlin 21, Global Conference in Berlin, July 2000), sustainable urban development is defined as an effort to improve the

quality of life of the city and its citizens without causing a burden for future generations due to the depletion of natural resources and environmental degradation. The concept of spatial hybrid (Gordon and Richardson, 1998) indirectly can be indicated as a form of sustainable urban development that overcomes the problem of urban sprawl in urban periphery. Specifically selected cases of suburbs of Surabaya-Sidoarjo as a test of the findings of parameters associated with the suburbs as a spatial hybrid concept that makes the periphery areas remain sustainable. Sidoarjo was chosen as the border area with Surabaya City, because the readiness of land conditions is more possible compared to the other Surabaya edge.

II. METHODS

The method of this research is descriptive research that is intended to describe the phenomena that exist and are underway at this time or the past. This study does not manipulate or alter the independent variables, but describes a condition as it is. The depiction of conditions can be individual or use numbers. Descriptive research, not only describes a situation only, but also describes the state in the stages of its development. Such research can be called developmental studies. In this developmental research there is a longitudinal or all the time and there is a cross sectional or in time pieces (Sukmadinata, 2007).

The first step in this study is to summarize the various literature on urban sprawl and urban periphery, yielding a summary of the findings of problems caused by urban sprawl in urban periphery. Subsequently investigated the phenomenon of field due to urban sprawl in case study of suburb of Surabaya and Sidoarjo. In addition to the findings of problems caused by urban sprawl in case studies, as well as sought possibility of positive findings, alleging that something bad due to urban sprawl in the field in fact the area still exist to survive. This is reinforced by the findings of libraries that support the reasons for the area still exist, namely the concept of spatial hybrid. So the purpose of this study is to get a specific model of urban suburb arrangement, which can contribute to urban planning process in the suburbs so as to remain sustainable.

III. RESULT

Definition of Urban Sprawl

The definition of urban Sprawl according to Slaev and Nikivorof (2013) is an unplanned condition of urban development in the form of physical expansion processes and inefficient conditions including urban to surrounding countryside or natural land characterized by: a). Low density of new developments, patchwork, scattered forms, with a tendency to discontinuity, b). Different land use mixtures in urban activities, lack of good definition include developing centers of activity relating to public services and commerce, c). Not sufficiently covered by public transport services.

The first characteristic of urban sprawl is the physical extension of the urban to the surrounding area of rural land. In addition, another definition is suburban development with low density, patchwork, scattered forms, with a tendency to discontinuity. There is a difference in treatment between European and American researchers. Among American writers quoted here, only Galster et al. (2001) which states that expansion as a key element of this phenomenon. Chin (2002) finds that the term "expansion" is used to describe more to the compact form of Urban Sprawl especially in the early definitions of the 1950s and 1960s (Chin cited Diri, 1961, Gottmann and Harper 1967, Gottdiener, 1977, Hall, 1997).

The main factors causing urban sprawl Chin (2002) are: a). Population growth is a strong factor for increasing demand for housing. That is because of the lack of housing supply in the city center and the result of high housing construction on the outskirts, where more land is available (Chin, 2002), c). Residential preferences - a consensus among researchers that housing preferences is the main factor causing urban Sprawl. Housing options in the countryside are driven by higher income levels, increased personal mobility and improvements in transport. Audirac et.al. (1990) have concluded "Ideal having a home for a single family, a strong desire for privacy, and a rural atmosphere are the main reasons for choosing suburban and local exurban", c). The role of the market as a housing demand has been mentioned in terms of either population growth, or preference. Brueckner, 2000, Self, 1961, Audirac et al., 1990, and others analyzed urban Sprawls caused by consumer demand and other market-related factors.

City Dynamics and Metabolism

The urban growth trend is the radial expansion of the district center by a series of concentric circles (Burgess, 2008). Regardless this theory confirms that even more fundamental urban growth is expressed as a result of organization and disorganization of metabolic state of the city that can be measured by mobility. The new territory is characterized by hybridization and "parasitism",

Urban Growth Expansion

According to Stan A. (2013), there is partial overlap in urban dynamics, urban growth and urban expansion, with the worst case in urban most criticized urban Sprawl. This condition refers to the effects of disasters on the environment. Something of what is perceived as "urbanization" but is actually "suburbanization", and in the first stage, it is Sprawl. Judging through the growth of cities in the last period, urban morphology reflects this difference. The urban form coming from different levels can be referred to as "Implant" metabolism. Not all territorial dynamics lead to urban growth, and not all urban growth leads to Urban Sprawl. The Sprawl phenomenon is seen not only on the downside, but as part of urban growth, including urban development is a vision that can bring benefits in future urban planning.

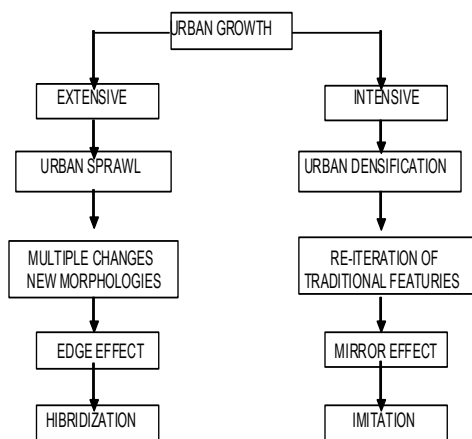


Figure 1. City Growth Chart in Morphology Level

Sprawl as a Process and Change of Urban Limits

Stan A. (2013) describes new areas of an urban border expansion, can not be simply understood, although the

term from the periphery itself etymologically brings the boundary comprehension to the "peri" ending. The process of urban expansion and the emergence of the term periphery has been used in the era of postmodernism. This will speak fragmented culture, where the role of the limit is essentially different from the previous understanding. At the end of the decade of the twentieth century, the waning of the central term as a concept of alignment with the new. Understanding of territory as the number of unstable entities crossed boundaries that can not be defined in terms of coherence (Stan A, 2009). In urban studies often focusing on problem identification and articulation of solutions, the understanding of limits by contemporary intellectuals into discourses with many meanings and interpretations, has resonance in some overlapping urban discourse.

Compactness, Dispersion: Re-composition and Re-creation

The city of the future is the place where something fragment will once be broken and then it is forming "recomposed" (Rosi, 1984). The new theory on the New Urbanism movement asserts that "compact city" is the only model accepted as a sustainable city development. Suburban growth has a new role in spatial and functional differentiation to obtain mixed use, with common principles such as quality of life and urban sustainability. New Urbanism leads to a return to traditional model city organizations with a gradual transition from high density to low density centers for The suburbs became a very different model of conventional urban development, which focused on urban intensification. During the early 1990s, the compact urban policy derived from New Urbanism was largely undertaken by planners, particularly in Great Britain and throughout the Kingdom of Europe, Sustainable development ", popularized by Brundtland (1987). At this stage there is a critical analysis, whether the compact city can fulfill its promises to provide sustainability value. As a result, a fierce debate over compact cities. Follow-up studies begin to show that benefit prediction does not occur as it should and does not reflect the harsh realities of economic demands of environmental sustainability and social expectations "(Elkin et al., 1991). While the other point of view, the widespread urban growth of Sprawls would be to formalize and be spatially hybridized (Gordon and Richardson, 1998).

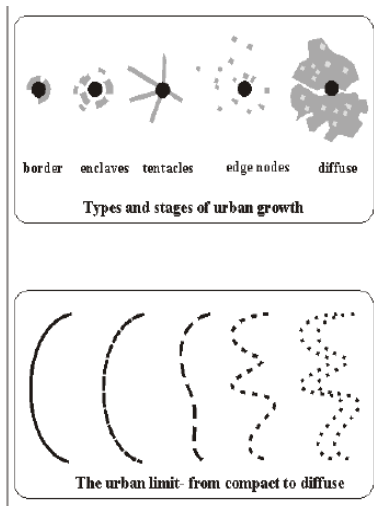


Figure 2. Synthetic illustrations of types of urban growth and metamorphosis boundaries (Stan A., 2009)

The morphology and (Re) design of Urban Sprawl area

Stan A. (2013) describes that different morphological and spatial urban forms lead to the idea that urban expansion would be a kind of "laboratory" experiment of soil. More recent research has raised important issues about the complexity of urban environments, which can lead to urban intensification of policies to have consequences that are less suited to sustainable urban goals. The complexity of the expansion zone claims that instead of concentrating on one particular solution, there is a need to recognize that urban diversity tends to coexist in cities. City compaction is only seen as one way to achieve sustainable urban forms. Furthermore, the intensification policy is likely to be successful when adjusted to existing urban landscape from a particular environment. The recent literature does not propose urban sprawls, as the negative impact of sprawls appears to be widely recognized in public services and land acquisition. Some studies emphasize the complexity of the relationship between urban form, function and sustainability, with larger variables focusing on the functioning of the city and something that affects sustainability rather than just the pattern of its form. Sustainable City Forms, Williams, Jenks and Burton claim that "Recently there is some consensus that compact urban forms are offered for a sustainable future." (Williams and Burton, 1999). Peripheral development appears to be important and a responsible

part of sustainability planning itself. It becomes (Re) the "design" of the city, in the environment and the community level. This has become an important consideration for creating a good urban environment, where landscape hybrids claim to be more complex approaches.

Hybrids Urban Sprawl Characteristics

According to Richard T. T. Forman and Michael Godron, landscaping is a heterogeneous field consisting of interacting clusters that are repeated in the overall form (Forman, 1986; Godron, 1998). Extrapolation of this relates to the ecological point of view, useful for understanding the phenomenon of expansion, the suburban urban landscape identified as "landscape composition", some of which are in opposition positions in terms of proportion and scale. Heterogeneity becomes an intense landscape in urban expansion into a short definition of hybrid. This is a concept that can be explained either by the dynamics of the patch in the landscape and the configuration patchwork structure. Landscape patches define the basic structure of the landscape and their quality affects the quality of the entire environment. Landscape is a condition of patchwork structure (mosaic) associated with the boundaries of the patch. This can be either continuous or discontinuous. Landscape hybrids are multilayer objects, work with systems, processes, dynamic mechanisms, which connect information. The characteristic hybrid character develops from purity, compromise and composite. Hybrids are coexistent spaces and places, transfusions, interconnections, ambivalences, and heterogeneity. The concept of hybridization is a real creative process, a combination that produces openness, flexibility, multiple views, and informal support (I. Stan, 2013).

Peri-Urban areas

Adell (1999) and graduate scholars have tried to define peri-urban areas, but no agreement has been reached. They generally agree that peri-urban districts are an area adjacent to urban growth, and are characterized by strong influence with urban activity, easy access to markets and urban-characteristic facilities. The

relationship between the city and the suburbs is a functional one, characterized by the flow of commuting from city to suburban area and vice versa (Caruso, 2005). Suburban areas are usually not densely defined and are defined as areas of transition between urban function use and rural use, this can also be defined as rural cities. The boundaries are not rigid, spreading and are often considered transitional zones. Traditionally, this transition zone features a dynamic diversity of land uses, mixed-labor work from rural-based employment to urban-based employees. They are also a mixed population zone with migrants, where most of the rural poor seek to find informal employment in generating income from some activities. Peri-urban is seen to have different characteristics in developed countries (north) and developing countries (south) (Woltjer, 2014). In developing countries, in the absence of mature planning regulations, the region is under increasing pressure in its development, and usually changes from previous rural activities to mixed with urban activities in land use. Some scholars have seen this process as part of metropolitanisation, expansion of metropolitan commodities and labor markets in rural farming rather than rural urbanization (Briggs & Mwamfupe, 2000; Ginsburg, Koppel & McGee, 1991; McGee, 1989). As cities in developing countries continue to grow, their suburbs tend to move outward in waves creating urban sprawls. In Asia, the extension of this area can reach as far as 300 km from the major cities, as shown by the peri-urban coast in China (Webster, 2002). This extension is certainly much larger than that of Africa, which usually falls within 30-50 km beyond the city limits.

Separation (Segregation) and Urbanization

Spatial segregation in urban areas implies the occupation of a plot of land by different social groups that are not homogeneously distributed. Instead, they group themselves according to their status, ethnicity, and origin. In a broader context, this is about the differentiation of housing or social division of space (Barbosa, 2001). Spatial segregation can also be interpreted as an unequal distribution of the urban population groups. This refers to the phenomenon that certain groups are high in numbers in certain areas of a city, but low in other areas. Therefore, spatial segregation is always associated with spatial

concentrations of specific population groups (Bolt et al., 2006).

Characteristics of the Peri-Urban

According to the Organization for Economic Co-operation and Development (OECD) (2007) the term 'peri-urban' came into the public domain and use during the 1980s in Europe. OECD described suburbs as the name given to the 'gray area' which is not entirely urban or rural in the traditional sense. It is not entirely urbanized or completely rural, but is often seen as a 'Middle band' land with atypical characteristics (Buxton, 2007). It consists of an unbalanced mix of urban and rural functions. The suburbs function as zones where urban-rural interact at its peak (Johnson, 1974). In this zone, rural activities and way of life are retreating rapidly, with the widespread intrusion of urban land use.

Linkage of Suburban Areas and Physical Development

The dynamic and integrative nature of urban areas has been a major obstacle in outlining the physical development (land use) patterns of a region (Johnson, 1974). While peri-urban areas are interrelated with potential for change, the nature of physical development is complex and has no defined character. This is defined by unauthorized developments, spatial unit zones, non-contiguous developments and changes in land use (Johnson, 1974). Other authors argue that peri-urban areas are experiencing continuous improvement and are concerned about physical expansion as population growth (Buxton, 2007). In addition, literature on peri-urban dynamics suggests that as urban growth areas, most growth occurs on the periphery due to the availability of land at and also the nominal cost (O'Sullivan, 2000). Thus, peri-urban, with the virtues of their status as dormitory city, is dominated by the density of the medium and low housing development. Housing in the area is separated by a socio-economic class or ethnicity and usually clustered close to trains or major highways (Johnson, 1974). Another relationship is the development of leap frogging characterized by relatively low, noncontiguous density, dependent vehicles, housing and non-housing construction that consume agricultural land (Mather, 1989). Agricultural

land is converted into housing, commercial and industrial premises, and infrastructure such as roads, recreational facilities, landfills, and sewage treatment plants (Timms, 2006).

Social Border

Definition of the Social Border concept in the study approach is driven by the increasing attention to comparative studies and research with the concept of interdisciplinaires. The social boundaries are defined for the first time in the special literature of Lamont and V. Molnar. In the study of limits on Social Sciences, they define social boundaries as "a form of social inequality resulting from unequal access and symbolic resources and uneven distribution" (Lamont & Molnar, 2002, page 167). The analysis of the process of the formation of social boundaries has its origins in the works of classical sociologists. Durkheim and the difference between sacred and profane and Mr. Weber, who analyzed group status compared to ethnic groups (Gheorghiu, 2005, page 32). In the approach to defining the concept of the frontier, B. Moulin, distinguished in his book *The City and Border* (2001) three meanings of the term: - the boundary of the area that determines its size; - the boundary between the two countries which refers to the concept of national control and identity; - the boundary separator where the limit indicates the detachment, the desire to be single (p 36.). All these elements are the definition of social boundaries in specific literature by sociologist Dr. D. Gheorghiu in introducing *Book analysis and intervention in social science* (2005).

Using as a starting point the definition of social boundaries, the distinction between "inclusive" and "exclusive" between the ruler and the controlled, between the stable and marginal borders are the result of the process Social exclusion. The border is seen as "the instrument of the social order: dividing and regulating contact between classes, groups" (GheorghiuMerklen, 2011, p.33). Within a social group, they define the main features, have a hierarchy and define "insiders" from "outsiders", attributed to the exclusion of certain segments of the population. On the other hand, social boundaries allow the entry of those who are considered différents.

Borders and Identity in Urban Suburbs

Identity is one of the important directions of contemporary urban research. The exclusion and social segregation involved in the formation of community identity, investment and urban development, the environment is part of the process of implementing individual personal and social identity forms (Mata Barreiro, 2004, p 41). Personal Identity is associated with the individual as a unique person and maintains the subject's experience of feeling and is recognized with respect to others. Social identity is given by a set of objective characteristics that identify the individual from the outside. The fact that we see ourselves as members of a composed social group allows us to identify socially. Given the fact that an individual can have a "social identity repertoire" (Gender, nationality, age, professional category, cultural practices, etc.), social identity is defined as a set of groups with which an individual can identify. The goal dimension of identity, we mark the position of the subject in society and in the zone in which it operates (Catrina, 2010, p.46). The concept of social identity is common to many, it is the identity defined by the sense of the individual in the social group. In this case, R. Poledna that such an identity can be "built in a particular context and social climate" (Poledna, 2001, p 57). The social identity of the theory is based on Tajfel's research and then on Turner's people and shows that individuals seek to maintain or enhance self-esteem. Social groups or categories (and membership in these groups) linked to positive or negative connotations, will be positive or negative social identities based on an assessment of the group that contributes to the formation of an individual's social identity.

The Urban Sprawl Handling Movement

a. The History of New Urbanism development

New Urbanism is often referred to as Traditional Neighborhood Development (TND), neo-traditional planning, Transit-Oriented-Development (TOD) or Compact Development concept. This movement emerged in the 1980s as an alternative to the conventional development concepts existing in suburban United States settlements. Along with the socialization of this concept, in 1989 the Traditional Neighborhoods Foundation published a national version of TND planning standards

to be introduced to city councils. Then formed an organization known as Congress for the New Urbanism (CNU). At the fourth congress meeting in 1996, the congress participants agreed to create a New Urbanism Treaty containing principles, policies, guidelines and design techniques. This movement believes that the concept of neo-traditional planning can solve the housing problems in the suburbs that have existed as a result of conventional approaches. This neo-traditional concept refers to the characters of the old city in the United States, such as small plots, short or zero GSBs, houses with front porches, large public spaces, multi-functional land use, narrow and interconnected roads. Such characters are found in cities, such as Charleston, South Carolina, Old City Alexandria, Virginia and Marblehead, Massachusetts. This movement is also being developed in Europe, The Urban Villages Forum in the UK and The European Sustainable Cities Campaign in mainland Europe.

B. Principles of Planning and Design of New Urbanism

In general, the New Urbanism movement adheres to several planning principles for urban development, namely:

1. Restoration of urban centers and cities that exist within a single metropolitan area.
2. The re-establishment of irregular suburban settlement areas into a living community environment and multi-functional land use.
3. Conservation of the natural environment.
4. Preservation of artificial environment relics.
5. Land and resident use should vary within a community environment.
6. Pedestrians including public transport and cars should be designed within a community environment.
7. The city should be formed by a clear physical form and an easily accessible public space.
8. Urban areas should be shaped by architectural designs and landscapes that appreciate local history, climate, ecology, and development practices.

This movement also received some criticism, among others:

1. Focussing on things that seem physically and forget the things that are social, political and economic.
2. In fact, many real estate with the concept of TND is difficult to create multi-functional land use for the establishment of a community. In addition, some projects that implement the concept of TND can not achieve the original goal of being an inclusive housing but rather being exclusive housing only for the upper middle class, such as some real estate in Austin, Texas, Spring Hollow Farm, New Commerce Village, and City of the Immortals (Knack, 1989).
3. Consumers are not concerned with what is offered by the new urbanist but the conventional concept that is oriented to motor vehicles (C. Tu and J. Eppli, 1999). Consumers, especially the middle and upper class, are still interested in large plots, low density and single land functions. As for the developers of course for the benefit must meet this desire. Another obstacle is consumer concerns about security issues with the concept

of the alley behind the house plot.

4. Traffic congestion is not reduced, otherwise it might create traffic jams, because theoretically close proximity reduces the average travel cost, the cheap travel costs tend to increase the number of trips and increase the total distance of the journey. In addition, one of the cases of a delayed TND project due to community opposition was the Lakeside housing on the outskirts of Dallas, Texas planned by Andres Duany and Elizabeth Plater-Zyberk in 1994. In this case, communities surrounding the Lakeside project objected to housing plans with High density ie 5-6 floor apartment. In their assumptions the apartment will lead to crime, violence, gangs, and ultimately lower property selling value in the surrounding area. Facing this criticism, New Urbanism figure Peter Calthorpe argues that "building a community is a 200-year phenomenon."

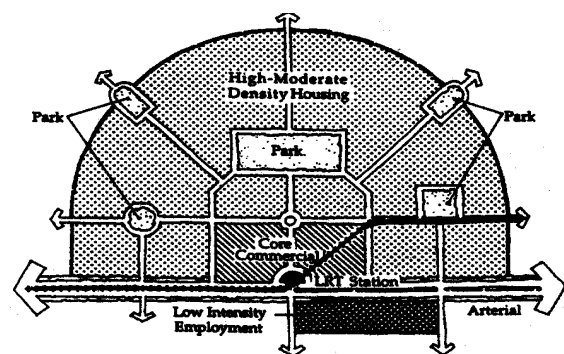


Figure 3. Multi Functions, High Density and Public Space on the TOD Concept

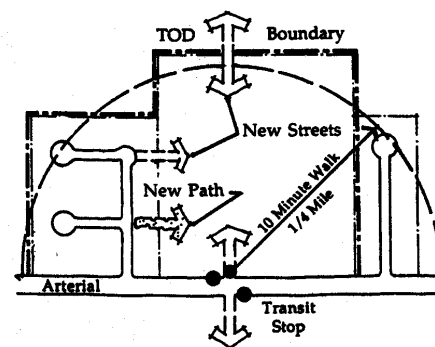


Figure 4. Pedestrian Pocket Concept, pedestrian-oriented

Other Urban Sprawl Handling Movements

According to Setioko (2009) research, in addition to new urbanism, other urban sprawl movements are among others the 70s decade came the concept of "new city" development in England. The "new city" philosophy is based on three main principles: 1) decentralization of the

already crowded area, 2) living independently, 3) balanced commonsity between the employed and the resident.

Five elements of the term "new city" are: 1) Level of independence, 2) a balanced community, 3) diversity of land use patterns, 4) self-governing, 5) urban areas (Golany 1976: 26). For third world countries (Danisworo, 1984) offers a new concept of "new city". The concept, when viewed on a regional scale, serves as a policy instrument to tackle urbanization and on an urban scale is a catalyst for the gradual integration of the sociocultural culture of rural communities, from traditional rural communities to modern society. This concept offers a new alternative to traditional rural communities with no need to immigrate to a big city if they wish to become a modern society. Another concept is Transit Village, because in reality it is similar to TOD, it is often mixed up, but still has differences. The Transit Village is characterized by: 1) integrating with nature, 2) always close to the train line, not close to the bus/ car line. Transit village has a building density of 12-60 units per acre house (TOD 7-15 units per acre house). The average occupancy is a quarter of a mile from the station. The center of the neighborhood is surrounded by civic and public space and the distance can be reached by walking for five minutes (Gillham, 2002: 184). Edges Cities is a concept popularized by Garreau in 1991, defined as the development of suburbs equipped with a major center of activity and a regional retail activity center. There was a shift that was once an industrial city-based economy, transformed into a municipal economy-based service deployment. Thus the suburbs change from rural areas to shopping and office areas. Garreau gives rise to five factors in the edges of cities: 1) more than 465,000 m² of office space; 2) a minimum retail trade area of 56,000 m²; 3) more workplaces than residential; 4) the residents should feel a "place"; 5) Edges cities unlike the cities 30 years ago (Calthorpe and Fulton, 2001: 2).

Similar approaches but with different names continue to emerge as: network city (Batten, 1995), postmodern city (Dear, 2000), city boundaries and compact cities (Jenks and Burgess, 2000; Holcombes, 1999). The various concepts of urban growth and the newly-funded city development strategy mentioned above are not able to stop the growth of urban sprawl in the periphery.

Sustainable Urban Development

The definition of sustainable urban development is in harmony with the understanding of sustainable development, where space perspective is focused on urban space. As stated in Urban Sustainability (Berlin 21, Global Conference in Berlin, July 2000), sustainable urban development is defined as an effort to improve the quality of life of the city and its citizens without causing a burden for future generations due to the depletion of natural resources and environmental degradation. In accordance with the characteristics of a city, sustainable urban development can be defined as an ongoing effort to improve the quality of life of urban residents through increased productivity in the secondary and tertiary sectors and the provision of viable urban infrastructure and facilities taking into account the impact of the invasion and intensification of built areas on environmental damage municipalities as well as require high urban involvement in efforts to conserve natural resources and control environmental quality degradation.

Graham Haughton and Colin Hunter (1994) emphasize three basic principles of sustainable urban development, namely: 1. The principle of intergeneration equity which is the principle of sustainable development with future orientation. 2. The principle of social justice in the gap of access and distribution of natural resources is intragenerated to reduce poverty considered as environmental degradation factors. 3. The principle of responsibility (transfrontier) that ensures a minimal geographical shift in environmental impacts with compensation efforts. In the urban context, it is expected that the utilization of natural resources will not occur and the decrease of environmental quality in areas outside the urban areas that have an excessive impact on the growth rate. The Indonesian Decentralized Environmental and Natural Resources Management Project (IDEN) and Urban and Regional Development Institute (URDI) workshop also proposed several principles of sustainable urban development in Indonesia, which are in line with those expressed by Graham Haughton et al.

The following principles need to be re-adapted to local conditions (Source: Appendix F, Workshop Materials, Strengthening Action for Sustainable Urban Development in Indonesia, Final Report on Preparation Stage Cooperation between IDEN and URDI, as well as

active participation from other related institutions/parties, December 2004), namely: 1. Have a long-term vision, mission and strategy that is realized consistently and continuously through plans, programs, and budgets with participatory incentive-disincentive mechanisms. 2. Integrating economic growth efforts with the realization of social justice, environmental sustainability, community participation and cultural diversity. 3. Develop and strengthen cooperation and partnerships among stakeholders, inter-sectoral, and inter-regional. 4. Maintain, develop and use wisely local resources and gradually reduce dependence on outside resources (global) and non-renewable resources. 5. Minimize the ecological footprint of a city and maintain and even increase the local ecological carrying capacity. 6. Implement social justice and develop people's awareness of the environmentally friendly patterns of consumption and lifestyle for the benefit of future generations. 7. Provide a sense of security and protect the rights of the public. 8. Adequacy of justice. 9. Create a conducive climate that encourages people who learn to improve the quality of life on an ongoing basis. Related to the pillars of sustainable development, the concept of sustainable urban development is also based on four main pillars, namely the economic, social, and environmental dimensions supported by the pillars of governance.

IV. DISCUSSION

1. Suburban Surabaya Based on Surabaya Spatial Plan (RTRW) 2013, that Surabaya City can be translated into two areas that influence it, among others: Internal region: Surabaya is divided into 31 District. External areas: The external areas of Surabaya City have strong links in various aspects of the city life and livelihood are Gresik and Sidoarjo. The observable trend of development to date is that the three areas are almost physically integrated as well as from the economic side (agglomeration process). Thus growth and development of Surabaya City can not be separated from this external territory. The north and east sides of Surabaya City are adjacent to Madura Strait waters area, South side is bordered by Sidoarjo regency and West side borders Gresik regency.

The North side of Surabaya City is certainly not likely to be used for extensive urban development, as it is adjacent to the waters dominated by sea transportation functions. It is also designated as Military Area and

Strategic Industrial Area. While East side of Surabaya City development is sluggish because it is bordered by East Coast waters area of Surabaya. This is increasingly sensitive to the plotting of green belt areas that serve as a conservation area. This conservation area is dominated by brackish water aquaculture and mangrove ecosystem. Of the two borders of Surabaya City with surrounding districts, the most significant development of the city is that towards the Sidoarjo regency. This is because Sidoarjo regency is topographically and the condition of the land is more accommodative for urban development especially housing. Accommodative land conditions are relatively flat, shallow and freshwater soils, paddy field conditions are quite fertile. While the borders in Gresik Regency have relative obstacles from the slightly contoured topography, the groundwater conditions are quite deep and brackish, and some of the land is salt aquaculture.

2. Sub-District of Sidoarjo Based on Spatial Plan (RTRW) of Sidoarjo Regency 2009. Sidoarjo Regency is a district enclosed by two rivers, Porong River and Surabaya River. The landscape of Sidoarjo regency, based on topographic configuration, slope angle, flow pattern and shape of embankment (relief) are terrain and bumpy terrain. The investigation of the slope of the area ranges from 5 - 15%. The terrain landscape is formed by the alluvial sedimentation process of the coast and river delta. The height of the terrain topography ranges from 4-10 meters above sea level, with a slope of between 0-10%. This landscape develops into urban areas, settlements, industry, rice fields and plantations. The bumpy landscape is located north of Sidoarjo with an altitude between 10 - 25 meters, with a slope of 5 - 10% or more. This landscape develops into residential and urban areas. The main rivers that flow along the seasons with the valleys are generally U-shaped, among others: Brantas and Porong River that flows eastward and empties into the Madura Strait. The river flow pattern formed on this plane is the Sub dendritic flow pattern.

Of the 18 districts in Sidoarjo regency, there are three districts adjacent to Surabaya City area. They are subdistricts Taman, Waru and Sedati, which on its growth have been very urban with a variety of land use. Residents on there perceptually feel live in Surabaya, whereas administratively located in Sidoarjo regency.

The growth of Surabaya City has penetrated in the sub-districts that are not directly adjacent to the administrative city of Surabaya.

The second layer of sub-districts (Sukodono and Gedangan) are in accordance with the so-called urban sprawl. The suitability of the characteristics of urban sprawl is partly due to the spreading urban growth, penetrating the agricultural land, there is a firm segregation between urban and rural communities that has the potential for social conflict.

So the conclusion is the suburbs that became the meeting of two regions, namely Surabaya and Sidoarjo, essentially divided into three zones. Zone 1 of the suburb of Surabaya, which is administratively adjacent to Sidoarjo Regency (Karangpilang, Jambangan, Gayungan, Wonocolo, Tenggilis Mejoyo and GunungAnyar) has urban characteristic. Zone 2 of the outskirts of Sidoarjo Regency bordering on Surabaya (Taman, Waru and Sedati) is urban. Zone 3 is the second-tier district of Sidoarjo from the edge (Sukodono and Gedangan) characterized by Urban-Village. These three zones are potential as the choice of case studies that exist in this study.

V. CONCLUSION

From the discussion above, it can be drawn some conclusions. Among them are: 1). The development of the city to the outside resulted in the occurrence of urban sprawl that has a variety of types and forms. This diversity is related to its location to the city and its pattern of population increase as well as the intensity of land use change. In parts of the region adjacent to the city, the character of the region will be more quickly turned into urban, let alone supported by the way of life and livelihood of the population who are also characterized by urban. 2). In the case that occurred in the area adjacent to the main city of Sukodono and Gedangan sub-districts, the people living there felt as surabaya residents although living in the region of Sidoarjo. This happens because they can take advantage of almost all the city facilities provided by Surabaya compared to those provided by sidoarjo. 3). In relatively more distant areas of the main city, urban growth runs sporadically and spreads in disorder in land use patterns, distribution of support facilities and population density. In these areas there is often a lack of public infrastructure that local municipalities have not been able to provide. 4). When further examined, the implementation of the Spatial Hybrid concept for the peri-urban surabaya-sidoarjo has several developmental patterns that depend

on several factors: distance to the city, the intensity of space utilization, the number of land use changes, and also the population growth.

References

- [1] Adell, G. (1999), *Theories and models of the peri-urban interface: A changing conceptual landscape*. London: Development Planning Unit, University College London.
- [2] Bolt, G., et al. (2006), *Immigrants on the housing market: Spatial segregation and relocation dynamics* (Paper for the ENHR conference 'Housing in an expanding Europe', Slovenia).
- [3] Breuckner, J. K. (2000), *Urban Sprawl – Diagnoses and Remedies*, International Regional Science Review 23, 2: 160–171.
- [4] Burgess W. E. (2008), *The Growth of the City: An Introduction to a Research Project*, Urban Ecology 24:16-26.
- [5] Buxton, M. (2007), *Change in Peri-urban Australia: Implications for Land Use Policies*, Australia: Department of Environment and Heritage Publishing Unit.
- [6] Caruso, G. (2005), *Integrating urban economics and cellular automata to model periurbanisation* (Universit_e Catholique de Louvain dissertation).
- [7] Chin, N. (2002), *Unearthing the roots of urban Sprawl: a critical analysis of form, function and methodology*. Paper 47, Centre for Advanced Spatial Analysis, University College, London.
- [8] Elkin T., McLaren D., Hillman M. (1991), *Reviving the City: towards sustainable urban Development*, Friends of the Earth 8:12-13.
- [9] Forman R.T.T., Godron M. (1986), *Landscape ecology*, Wiley, New York. Gordon P., Richardson H.W. (1998), *A Critique of New Urbanism*, Meeting of the American Collegiate Schools of Planning, Pasadena.
- [10] Galster, G., Henson, R., Ratcliffe, M. R., Wolman, H., Coleman, S., and Freihage, J. (2001), *Wrestling Sprawl on the Ground: Defining and Measuring an Elusive Concept*, Housing Policy Debate, Volume 12.
- [11] Gheorghiu, M. Dinu (2005), *Analiză și intervenție în știința socială/ Analysis and intervention in social science*. Iasi: Editura Universității Alexandru Ioan Cuza.

- [12] Gillham, Oliver (2002), *The Limitless City*, A Primer on the Urban Sprawl Debat, USA: Island Press.
- [13] Graham Haughton, Colin Hunter (1994), *Sustainable Cities*, J. Kingsley Publishers
- [14] Haryo Winarso, Delik Hudalah, Tommy Firman (2015), *Peri-Urban Transformation In The Jakarta Metropolitan Area*, International Journal scopus, Yoris Adi Mareta, Associate Editor DOAJ.
- [15] Hudalah, D., Winarso, H., & Woltjer, J. (2007), *Peri-urbanisation in east Asia: a new challenge for planning?* International Development Planning Review, 29, 503e519.
- [16] Johnson, J.H. (1974), *Suburban Growth, Geographical Process at the Edge of the Western City*, Aberdeen: Aberdeen University Press.
- [17] Lamont, Michèle & Molnar, Virág (2002), *The Study of Boundaries in Social Study*. Annual Revue Sociology, Vol. 28, pp. 167-195.
- [18] Munasinghe, M., *Sustainable Development Triangle*, 'Sustainable Development', edited by Cleveland, C. J. (2007).
- [19] Organisation for Economic Co-operation and Development (OECD) (2007), *The Growing Peri-Urban Phenomenon*, Report of One Week Conference held in France.
- [20] Polidoro, Mauricio; de Lollo, José Augusto; Fernandes Barros, Mirian Vizintim (2011), *Environmental Impacts of Urban Sprawl in Londrina, Parana, Brazil*, International Journal scopus, Yoris Adi Mareta, Associate Editor DOAJ.
- [21] Rossi A. (1984), *The Architecture of the city*, MIT Press, New York.
- [22] Setioko, Bambang (2009), *Pertumbuhan Urban Sprawl di Kawasan Pinggiran Kota Semarang*, Proposal Disertasi Program Doktor Teknik Arsitektur dan Perkotaan Universitas Diponegoro Semarang.
- [23] Slaev, Aleksandar D. and Nikiforov, Ivan (2013), *Factor of Urban Sprawl in Bulgaria*, Spatium International review, No. 29, July 2013, pp. 22-29.
- [24] Stan A, (2013), *Morphological Patterns of Urban Sprawl Territories*, Urbanism. Arhitectură. Construcții Vol. 4 / Nr. 4 / 2013.
- [25] Sukmadinata, Syaodih N. (2007), *Metode penelitian pendidikan*, Bandung: Remaja Rosdakarya 2007
- [26] Tallo, Amandus Jong, Pratiwi, Yulia, dan Astutik, Indri, (2014), *Identifikasi Pola Morfologi Kota (Studi Kasus : Sebagian Kecamatan Klojen, Di Kota Malang)*, Jurnal Perencanaan Wilayah dan Kota, vol. 25, no. 3, hlm. 213-227, Desember 2014.
- [27] Williams K. (1999), *Urban intensification policies in England: problems and contradictions*, Land Use Policy 16(3):167-178
- [28] Woltjer, J. (2014), *A global review on peri-urban development and planning*. Jurnal Perencanaan Wilayah dan Kota, 25(1), 1e16.
- [29] <https://fitriwardhono.wordpress.com/2012/04/14/pembangunan-kota-berkelanjutan/>
- [30] http://74.6.239.67/search/cache?ei=UTF8&p=%22city+designed+with+consideration%22&fr=mymyy&u=en.wikipedia.org/wiki/Sustainable_city&w=%22city+designed+with+consideration%22&d=T2eEhExISq_o&icp=1&int=us.

Feeding Habits of Asian Green Mussel (*Perna viridis*): A Case Study from Andaman Sea and Gulf of Thailand

¹Teuku Haris Iqbal, ²Sukree Hajisamae and ³Supat Khongpuang

^{1,2,3}Department of Technology and Industrial, Faculty of Science and Technology
Prince of Songkla University, Thailand

¹tee.hariss@yahoo.com, ²sukree.h@psu.ac.th, and ³supat.k@psu.ac.th

ABSTRACT

This study is aimed to evaluate the impact of habitat on feeding habits and food selectivity of Asian green mussel *Perna viridis* collected from three different habitats including Suratthani and Trang provinces of Thailand and Aceh of Indonesia. Samples were collected between July and December 2016, and April 2017, respectively. Samples, 300 mussels, were collected by handpicking from the wild brought back to the laboratory for further investigation. It was found that *P. viridis* is omnivorous, feeding on a wide range of phytoplankton and zooplankton. Overall, *Coscinodiscus* was the major food item (41.78%), followed by mussel larvae (21.74%) and *Nitzschia* (6.58%). Mussels from different habitats ingested different food item. Result from ANOVA indicated that habitat highly affected both on total count and total item of food fed by *P. viridis* ($P < 0.0001$). They also demonstrated specific food selection based on availability of food resources in the habitats they reside. This finding helps in understanding how *P. viridis* feeds and selects food in nature from three different localities.

Keywords: Feeding Ecology, Feeding Selectivity, Green Mussel, Phytoplankton, *Perna viridis*

I. INTRODUCTION

Perna viridis is known as Asian green mussel from Family Mytilidae. There are 32 genera in Mytilidae including the genus *Perna* where *P. viridis* is [13]. It distributes in the Indo-Pacific regions [16] and the Southeast Asian coasts [13]. Commonly, *P. viridis* spat in natural settles on a fine surface, mostly reside in marine intertidal zone, and estuarine area. They usually occur at the depth of less than 10 meters and lifespan is approximately 3 years [13]. *P. viridis* is also known as a filter suspension feeder, which feed on organic particles from water column and reject the inorganic particles [17]. Phytoplankton was considered as main component of mussel's diet, which are diatoms and dinoflagellates [12]. However, some researchers reported that mussels fed on zooplankton [9, 2, 13, 17]. Food particles selection of mussels is an important section in feeding studies. Types of plankton selected by mussels from water column are poorly understood. Nonetheless,

selectivity could be related to escape ability and size of prey [3].

The aims of this study are to evaluate feeding habits, impact of habitat on diet and food selectivity by *P. viridis*.

II. MATERIAL AND METHODS

A. Study Area

Sampling was conducted between July and December 2016, and April 2017 from three different areas including Aceh, Indonesia (5°35'46"N, 95°20'50" E), Trang, Thailand (7°19'54" N, 99°29'24" E) and Suratthani, Thailand (9°15'28" N, 99°29'6" E) (Fig. 1).

A. Mussels and Food Collection

A total of 300 mussels were collected from all habitats, 100 for each habitat, during high tide condition by handpicking. Thereafter, samples were preserved with 5% formaldehyde for 6 hours, soak

ed with freshwater overnight, then preserved in 70% ethanol [2, 12].

Plankton both phytoplankton zooplankton and were collected simultaneously by plankton net (60µm) by towing the net at the vicinity of mussel sample collection.

B. Diet Analysis

Prior to dissection, mussels were opened by cutting the adductor muscle using surgical scalpel. Diet content was removed by using a glass Pasteur pipette through a small slit beneath crystalline style [17]. Extracted food materials from gut content were observed under microscope (Olympus CH30) with 4x and 10x magnification. The content was identified to the lowest taxonomic level possible.

C. Statistical Analysis

One-way analysis of variance (ANOVA) was performed to examine the effect of habitat on total count and total number of food item found in the diet.

D. Feeding Selectivity

The feeding selectivity of mussel was measured by using Ivlev's selectivity index (E'). $E' = (ri - pi) / (ri + pi)$, where E' is Ivlev's selectivity index, ri is relative abundance of prey item i in the diet content and pi is relative abundance of the same prey item in the water column. The value of Ivlev's selectivity index ranges from -1 to +1. A negative value indicates as a rejected prey, zero value indicates as randomized prey, and positive value is active selection on that prey [7]

III. RESULTS

E. Food Items

Total of 19 types of phytoplankton and 4 types of zooplankton were found in the diets of *Perna viridis*. Overall, *Coscinodiscus* was the major food (42.9%), followed by mussel larvae (21.9%) and *Nitzschia* (6.5%) (Table I). In Aceh and Trang habitats, most of *P. viridis* diet content was filled with *Coscinodiscus* while in Suratthani, a great composition of mussel larvae was found. *Ceratium* and *Triceratium* were found at all habitats.

F. Impacts of Habitat on Feeding

Result from ANOVA (Table II) indicated that habitat significantly affected both total count and total number of food item fed by *Perna viridis* ($P < 0.0001$). Average total count for Aceh, Trang and Suratthani were 31.1 ± 0.6 , 9.2 ± 0.6 and 12.6 ± 0.6 , respectively. Average number of food items for Aceh, Trang and Suratthani were 3.0 ± 0.1 , 3.7 ± 0.1 and 3.9 ± 0.1 , respectively. Based

on total count, it was found that *P. viridis* from Aceh habitat fed more food than other habitats. Results of a paired-wise Tukey test are in Table III.

G. Food Selectivity

Comparisons between plankton in water column nearby the mussel collection areas and in the stomachs of samples for each habitat are shown in Figures 2, 3 and 4.

Values of selectivity index for each habitat are shown in Figures 5, 6 and 7. It demonstrated that *P. viridis* in Aceh habitat actively selected *Coscinodiscus*, *Nitzschia* as the first food source and rejected some of the prey such as, Copepods, Tintinnids, *Melosira* and other genus (Fig. 5). Similar occurrence was found in Trang habitat where *Coscinodiscus* and *Thalassionema* were found as the main selected food fed by *P. viridis*. Yet, Copepods, Tintinnids and other foods were actively rejected (Fig. 6). In Suratthani habitat, *P. viridis* actively selected on mussel larvae together with *Ceratium*, *Coscinodiscus*, *Pleurosigma* and *Skeletonema* as their food. Barnacle larvae and copepods were considered as the rejected prey (Fig. 7).

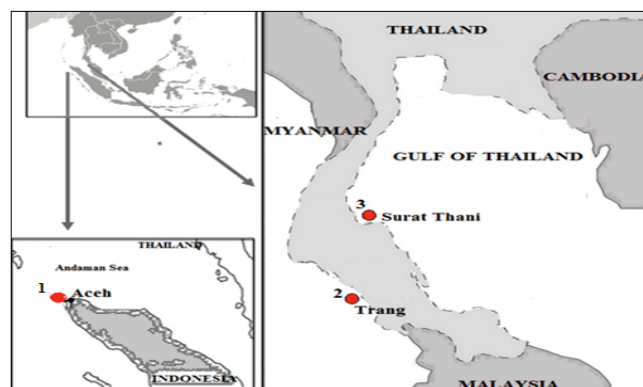


Figure 1. Sampling site of both Andaman Sea and Gulf of Thailand

TABLE I. RELATIVE COMPOSITION (%) OF FOOD ITEMS FOUND IN DIETS OF *P. VIRIDIS*

| Food in diet | Aceh | Trang | Suratthani | Over all |
|-------------------------|------|-------|------------|----------|
| Phytoplankton | | | | |
| <i>Ceratium</i> | 3.4 | 4.0 | 6.2 | 4.2 |
| <i>Chaetocheros</i> | 0.0 | 2.6 | 0.0 | 0.5 |
| <i>Cocclhodinium</i> | 0.0 | 0.3 | 0.0 | 0.1 |
| <i>Coscinodiscus</i> | 62.1 | 29.0 | 5.8 | 42.9 |
| <i>Dynopsis</i> | 0.0 | 0.2 | 0.0 | 0.0 |
| <i>Gomyaulax</i> | 0.0 | 0.1 | 0.0 | 0.0 |
| <i>Guinardia</i> | 0.0 | 2.9 | 0.0 | 0.5 |
| <i>Melosira</i> | 3.2 | 0.1 | 0.0 | 1.9 |
| <i>Navicula</i> | 0.0 | 0.2 | 0.0 | 0.0 |
| <i>Nitzschia</i> | 8.8 | 8.0 | 0.0 | 6.5 |
| <i>Noctiluca</i> | 0.0 | 0.2 | 0.0 | 0.0 |
| <i>Odontella</i> | 0.0 | 2.6 | 11.6 | 3.2 |
| <i>Pleurosigma</i> | 7.2 | 0.0 | 7.1 | 5.9 |
| <i>Pseudo-nitzschia</i> | 0.0 | 3.6 | 0.0 | 0.6 |
| <i>Rhizosolenia</i> | 0.0 | 4.2 | 7.7 | 2.6 |
| <i>Skeletonema</i> | 0.0 | 0.0 | 7.1 | 1.7 |
| <i>Thalassionema</i> | 4.8 | 8.2 | 0.0 | 4.2 |
| <i>Thalassiosira</i> | 0.0 | 4.3 | 0.0 | 0.8 |
| <i>Triceratium</i> | 0.5 | 1.1 | 2.7 | 1.1 |
| Subtotal | 89.9 | 71.8 | 48.2 | 76.8 |
| Zooplankton | | | | |
| Barnacle | 0.0 | 0.3 | 0.7 | 0.2 |
| Copepods | 0.5 | 0.7 | 1.5 | 0.8 |
| Mussels larvae | 9.1 | 27.0 | 49.6 | 21.9 |
| Tintinnids | 0.5 | 0.2 | 0.0 | 0.3 |
| Subtotal | 10.1 | 28.2 | 51.8 | 23.2 |
| Total | 100 | 100 | 100 | 100 |

VI. DISCUSSION

A. Food and Dominant food

Diet content analysis expressed that *P. viridis* ingested mostly phytoplankton and zooplankton. It is clearly that phytoplankton was the first choice of food from *P. viridis*, while zooplankton considered as the second choice except in Suratthani habitat. It could be caused by the availability and food supply in vicinity area leading to a consistency with food found in diet [14]. This finding was similar with previous researchers [14, 11, 17] who that found that phytoplankton was the main food for bivalve species. Indeed, phytoplankton

was first producer for food animal web chain with zooplankton as a second [15, 5].

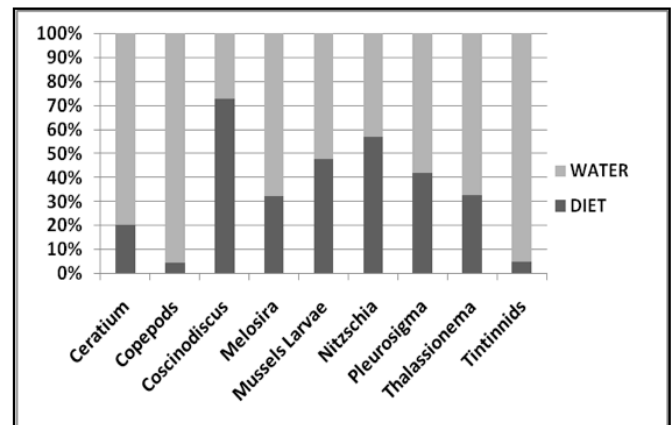


Figure 2. Percentage of food found in diet and water from Aceh habitat

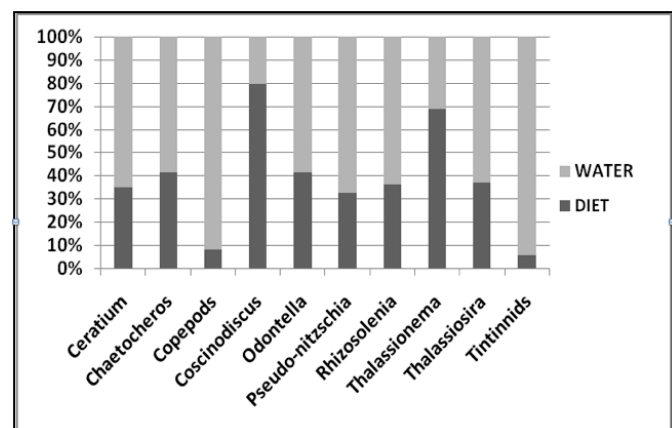


Figure 3. Percentage of food found in diet and water from Trang habitat

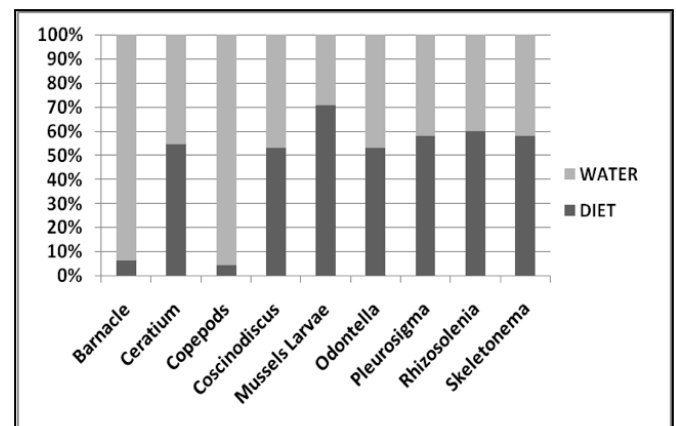


Figure 4. Percentage of food found in diet and water from Suratthani habitat

B. Impacts of habitats

Habitat may contribute to the difference of food found in diet. In this case, we found that *Perna viridis* in Aceh habitat consumed more food than other habitats. Due the collecting data was conducted on July 2016, it

was considered that particular time was a dry season. Dry season is declared as a healthy habitat, where *P. viridis* and other animal living in the water column show high growth and feeding rates in favorable conditions [13]. However, different habitat has slightly different food resources and may lead to different ingestion of food by mussel as mussels living in low energy and low food richness environment effected on food ingestion [6].

TABLE II. RESULTS OF ANOVA ONE-WAY ANOVA ON THE EFFECT OF HABITAT

| Source | df | MS | F | P value |
|---------------|----|----------|--------|---------------|
| Habitat | | | | |
| - Total count | 2 | 13863.72 | 357.31 | 0.0001 |
| - Total item | 2 | 25.87 | 14.79 | 0.0001 |

Among those three habitats, Aceh and Trang were located in estuarine area and Suratthani was in the bay area. The estuarine area reveals more abundant of phytoplankton from class diatom compare with bay or open shore area [14]. The water depth of each habitat where *P. viridis* collected may influence its feeding habits. The composition of food by *P. viridis* shows a different food diet, even living in a few meters of depth [6]. The abundance of food source especially diatoms is a significant factor for the number food found in diet, where this particular food is abundant in shallow habitat [14]. The difference of food particle among habitats caused the differences in quality and quantity of food itself [2]. Beside phytoplankton and zooplankton present in water column, other organic particle such as detritus may contribute as food source for *P. viridis* [6].

C. Food Selectivity

Figure 5, 6 and 7 show food selectivity of *P. viridis* towards preys. It was found that *P. viridis* actively ingested on *Coscinodiscus*. This may be due to the plenty of this group of phytoplankton present in water column. However, another assumption is that this food contains carbohydrate, lipid and protein compared to other foods [4]. Moreover, *P. viridis* is known as an opportunistic species selected a particularly food for gaining its metabolic and reproductive system [17]. *P. viridis* consume a highly protein food such as *Coscinodiscus* as their own gonad development [1]. Furthermore, the actively ingestion on *Coscinodiscus* was pertained to energy demand process where gametogenesis of *P. viridis* requires the appropriate food to build the increased energy [10]. Even though phytoplankton was considered as the main food for *P. viridis*, we found that in Suratthani habitat most of food

ingested by *P. viridis* was mussel larvae. The reason to explain this phenomenon is that Suratthani habitat is located at Bandon bay where huge aquaculture of *P. viridis* is farmed.

TABLE III. RESULTS OF TUKEY TEST ON THE EFFECT OF HABITAT

| Pairwise | P value | | |
|---------------|---------------|---------------|---------------|
| - Total count | Aceh | Trang | Suratthani |
| Aceh | - | 0.0001 | 0.0001 |
| Trang | 0.0001 | - | 0.0001 |
| Suratthani | 0.0001 | 0.0001 | - |
| - Total item | Aceh | Trang | Suratthani |
| Aceh | - | 0.0001 | 0.0001 |
| Trang | 0.0001 | - | 0.4 |
| Suratthani | 0.0001 | 0.4 | - |

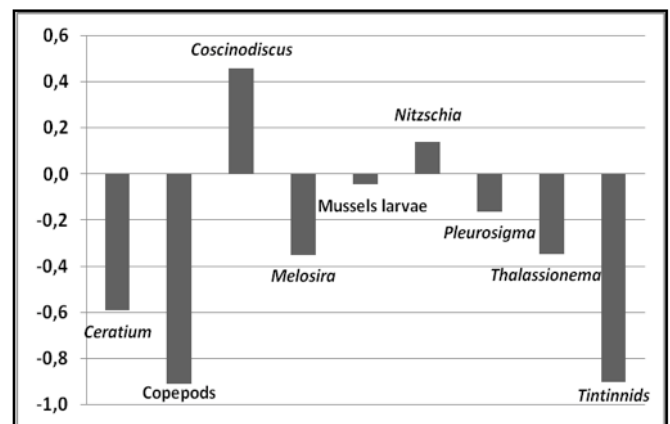


Figure 5. Value of food selectivity index made by *P. viridis* from Aceh

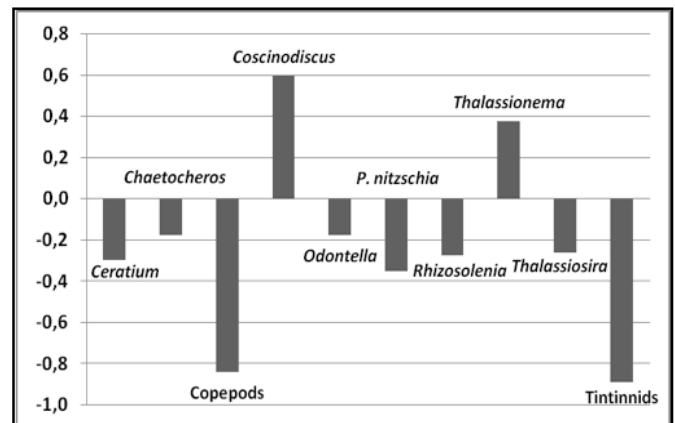


Figure 6 Value of food selectivity index made by *P. viridis* from Trang

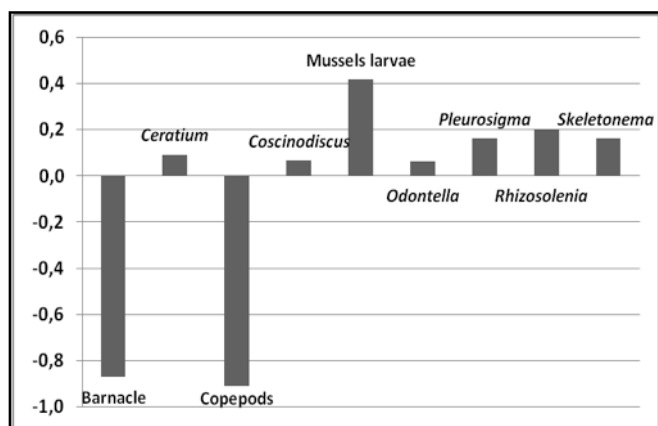


Figure 7 Value of food selectivity index made by *P. viridis* from Suratthani

Collecting mussel was conducted during April 2017. It was clearly declared as spawning season [8]. This again indicates that *Perna viridis* selected on their food based on its supply [14]. The behavior of feeding on their own larvae is cannibalism. Mussels can feed mussel larvae as the main food item in the circumstance that plenty of mussel larvae in water column especially during spawning season [2]. This is very interesting point for farming mussels where the mussel can partially produce their own food for survival and grow up.

VII. CONCLUSIONS

In general, the results from present research confirmed that habitat impact has a significant different food in diet in terms of food count and food item. Moreover, the selectivity of *P. viridis* was different among habitat, where *Coscinodiscus* is actively selected by *P. viridis* in Aceh and Trang, and mussel larvae is actively selected in Suratthani habitat.

This study has an important implication for next research with add other factors such as size, sex and season for a better understanding the feeding behavior of *P. viridis*.

Acknowledgment

We are grateful to Assoc. Prof. Dr. Sukree Hajisamae for his inception idea for this study and SAT-ASEAN Scholarship for international students for giving chance to study Master Degree. This research was fully financed by Graduate School Funding, Prince of Songkla University.

References

- [1] Al-Barwani, S.M., Arshad, A., Amin, S.M.N. and Bujang, J.S. Incidence of hermaphrodites in green mussel *Perna viridis* along the west coast of Peninsular Malaysia. *Asian Journal of Animal and Veterinary Advances*, 2012, pp. 1-7.
- [2] Alvaro, A.C. Evidence of cannibalism and benthopelagic coupling within the life cycle of the mussel, *Perna canaliculus*. *Journal of Experimental Marine Biology and Ecology*, 2006, vol. 329, pp. 206-217.
- [3] Arapov, J., Ezgeta-Balic, D., Peharda, M. and Nincevic-Gladan, Z. Bivalve feeding – how and what they eat?. *Ribarstvo*, 2010, vol. 68 (3), pp. 105-116.
- [4] Bayne, B.L., Iglesias, J.I.P., Hawkins, A.J.S., Navarro, E., Heral, M. and Delous-Paoli, J. Feeding behaviour of the mussel, *Mytilus edulis*: responses to variations in quantity and organic content of the seston. *Journal of Marine Biology*, 1993, vol. 73, pp. 813-829.
- [5] Bir, J., Sumon, M.S. and Rahaman, S.M.B. The effects of different water quality parameters on zooplankton distribution in major river systems of Sundarbans Mangrove. *Journal of Environmental Science, Toxicology and Food Technology*, 2015, vol. 9 (11), pp. 56-63.
- [6] Davenport, J., Ezgeta-Balic, D., Peharda, M., Skejic, S., Nincevic-Gladan, Z. and Matijevic, S. Size-differential feeding in *Pinna nobilis* L. (Mollusca: Bivalvia): exploitation of detritus, phytoplankton and zooplankton. *Estuarine, Coastal and Shelf Science*, 2011, vol. 92, pp. 246-254.
- [7] Jacobs, J. Quantitative measurement of food selection. A modification of the forage ratio and Ivlev's electivity index. *Oecologia*, 1974, vol. 14, pp. 413-417.
- [8] Kripa, V., Mohamed, K.S., Velayudhan, T.S., Joseph, M., Alloycious, P.S. and Sharma, J. Comparison of growth and gonad development of farmed green mussel *P. viridis* L. in three habitats. *Journal of the Marine Biological Association of India*, 2009, vol. 51 (2), pp. 199-204.
- [9] Lehan, C. and Davenport, J. A 15-month study of zooplankton ingestion by farmed mussels (*Mytilus edulis*) in Bantry Bay, Southwest Ireland. *Estuarine, Coastal and Shelf Science*, 2006, vol. 67, pp. 645-652.
- [10] Lopez-Lima, M., Lima, P., Hinzmann, M., Rocha, A. and Machado, J. Selective feeding by *Anodonta cygnea* (Linnaeus, 1771): The effects of seasonal changes and nutritional demands. *Limnologia*, 2014, vol. 44, pp. 18-22.
- [11] Muñetón-Gómez, M. S., M. Villalejo-Fuerte. and I. GárateLizárraga. Gut content analysis of *Anadara tuberculosa* (Sowerby, 1833) through

- histological sections. CICIMAR Oceánides, 2010, vol. 25(2), pp. 143-148.
- [12] Peharda, M., Ezgeta-Balic, D., Devenport, J., Bojanic, N., Vidjak, O. and Nincevic-Gladan, Z. Differential ingestion of zooplankton by four species of bivalves (Mollusca) in the Mali Ston Bay, Croatia. *Marine Biology*, 2012, vol. 159, pp. 881-895.
- [13] Rajagopal, S., Venugopalan, V.P., van der Velde, G. and Jenner, H.A. Greening of the coasts: a review of the *Perna viridis* success story. *Aquatic Ecology*, 2006, vol. 40, pp. 273-297.
- [14] Rouillon G., Rivas, J.G., Ochoa, N. and Navarro, E. Phytoplankton composition of the stomach contents of the mussel *Mytilus edulis* L. from two populations: comparison with its food supply. *Journal of Shellfish Research*, 2005, vol. 24 (1), pp. 5-14.
- [15] Sharma, R.C., Singh, N. and Chauhan, A. The influence of physico-chemical parameters on phytoplankton distribution in a head water stream of Garhwal Himalayas: A case study. *The Egyptian Journal of Aquatic Research*, 2016, vol. 42 (1), pp. 11-21.
- [16] Soon, K.S. and Ransangan, J. A review of feeding behavior, growth, reproduction and aquaculture site selection for green-lipped mussel, *P. viridis*. *Advances in Bioscience and Biotechnology*, 2014, vol. 5, pp. 462-469.
- [17] Soon, K.S. and Ransangan, J. Feeding behaviour of green mussels, *P. viridis* farmed in Marudu Bay, Malaysia. *Aquaculture Research*, 2016, pp. 1-16.



Poster





DESCRIPTION OF DOCUMENTATION OF NURSING CARE AT INPATIENT WARD IN BANJARBARU IDAMAN HOSPITAL, INDONESIA



Trisusilowati¹, Agianto², Minarti Manurung¹

¹Banjarbaru Idaman Hospital, South Kalimantan, Indonesia

²Adult health nursing department, School of Nursing, Universitas Lambung Mangkurat
(Correspondence, E-mail: yosyira193@gmail.com)

ABSTRACT

Nursing care is a nursing action that performed by nurses which use the nursing process approach to fulfilling the basic needs of patients. Nurses use nursing process as a systematic and organized method in nursing care that is focused on the reaction and response of the individual or group to the health problems. The nursing care plan is started from assessment, nursing diagnosis determination, nursing outcomes and intervention, implementation, and evaluation. A hospital in Banjarbaru used checklist sheet to record the whole process. The right way of nursing process will produce a good quality nursing care to patients. The aim of study is to determine the description of documentation of nursing care at inpatient ward in Banjarbaru Idaman Hospital, Indonesia.

Background

Nursing practice is one of the determinants of good and bad quality as well as the description of hospital, therefore nursing work needs to be improved as optimal as possible.¹ Quality assurance is used to assess the quality of nursing care implementation from assessment to documentation.² Not optimal of nursing care implementation will certainly have an impact on the quality of service.^{3,4,5} This can be seen with the incomplete documentation of nursing care. Nursing care documentation consists of assessment, nursing diagnoses, nursing out comes, nursing intervention, nursing implementation, and nursing evaluation. Nursing documentation as a part of nursing care standard should record the entire nursing process from the assessment to evaluation.

Methods

Descriptive study with retrospective approach was conducted at Banjarbaru Idaman Hospital from January to March 2016. The objective of study is to determine the description of documentation of nursing care at inpatient ward in Banjarbaru Idaman Hospital, Indonesia. There were 120 patient records were gathered in this study and authors used total sampling technique. Checklist sheet was used to collect the data from patient's medical record to gather the documentation of nursing care plan. It contains patient identity, main complaint, sensory, and history of family illness. It also consists of assessment data, nursing diagnosis, nursing outcomes, and nursing intervention that were documented by nurses on the medical record. For data analysis used frequency distribution (percentage).

Results

Table 1. Assessment Data of Patient That Documented by Nurses at Banjarbaru Idaman Hospital, South Kalimantan, Indonesia (n=120)

| No. | Assessment Item | Frequency | Percentage (%) |
|-----|--|-----------|----------------|
| 1. | Patient identity | 120 | 100 |
| 2. | Main complaint | 120 | 100 |
| 3. | General state | 2 | 1.7 |
| 4. | Sensorv | 120 | 100 |
| 5. | Cardio respiratory | 6 | 5 |
| 6. | Fluid nutrition | 3 | 2.5 |
| 7. | Rest and sleep | 21 | 16.7 |
| 8. | Activity | 1 | 0.8 |
| 9. | The maintenance of health recommendation | 12 | 9.2 |
| 10. | Communication | 1 | 0.8 |
| 11. | Emotional reaction of patient on illness | 1 | 0.8 |
| 12. | Self-perception | 3 | 2.5 |
| 13. | Spiritual | 85 | 68.3 |
| 14. | History of the current illness | 43 | 34.2 |
| 15. | History of previous illness | 104 | 82.51 |
| 16. | Family relationship | 1 | 0.8 |
| 17. | History of family illness | 120 | 100 |

Table 2. Nursing Diagnosis, Nursing Outcomes, and Nursing Interventions that Documented by Nurses at Banjarbaru Idaman Hospital, South Kalimantan, Indonesia (n=120)

| No. | Documentation Item | Frequency | Percentage (%) |
|-----|---|-----------|----------------|
| 1. | Nursing diagnoses | | |
| | Nursing diagnoses | 120 | 100 |
| | Etiology | 42 | 35 |
| | Defining characteristic | 83 | 69.17 |
| 2. | Nursing Out Comes | | |
| | Specify the label of out comes | 94 | 78.33 |
| | Time of nursing out comes | 42 | 35 |
| | The indicator of nursing outcomes label | 5 | 4.17 |
| | Rating scale | 88 | 73.33 |
| 3. | Nursing Intervention | | |
| | Label of nursing intervention | 119 | 99.17 |
| | Nursing activities | 115 | 95.83 |

Discussion

Each phase of the nursing process is related to each other as well as interdependent. Basically the purpose of the assessment is to collect objective and subjective data from the client. The collected data includes client, family, community, environment, or culture.^{6,7} So the assessment is the first step that is very important in the implementation of nursing care. While nursing diagnoses involve complex thought processes regarding data collected from clients, families, medical records, and other health care providers.^{2,7} Thus formulating a nursing diagnosis is important to determine outcomes and nursing outcomes in addressing patient problems. Likewise, nursing outcomes must be specific and clearly stated.^{4,8} The qualifications such as how, when, where, frequency, and magnitude provide the contents of the nursing intervention.

Conclusion

Nurses are expected to be able to assess the health of patients, to formulate the nursing diagnosis, to make the appropriate nursing outcomes and intervention. Able to document the whole process are necessary as well.

References

- Depkes RI. Standar asuhan keperawatan. Jakarta: Sagung Seto, 1999.
- Allen CV. Memahami proses keperawatan dengan pendekatan latihan. Jakarta: EGC; 1998.
- Nursalam. Manajemen keperawatan, aplikasi dalam praktik keperawatan profesional. Jakarta: Salemba Medika; 2002.
- Handayaniingsih I. Dokumentasi keperawatan DAR. Jogjakarta: Mitra Cendikia Press; 2007.
- Syamsudin. Hubungan penerapan standar asuhan keperawatan dengan kepuasan pasien terhadap pelayanan keperawatan di ruang rawat inap RSU PKU Muhammadiyah Yogyakarta. 2004; Available from URL: <http://www.fkm.undip.ac.id/data/nill>
- Aziz A. Pengaruh pelatihan pendokumentasian asuhan keperawatan terhadap motivasi dan kinerja perawat di RSUD Undata Palu. Tesis. Yogyakarta: Universitas Gadjahmada; 2005.
- Nursalam. Proses dokumentasi keperawatan, konsep dan praktik. Jakarta : Salemba Medika; 2001.
- Goodner.B & Skidmoor L. Panduan tindakan keperawatan klinik praktik. Alih bahasa Gede Asmin, N.L. Jakarta: EGC; 1995.



Decreasing the Number of Exporting Women Worker from Tulungagung by Using Tourism Package

¹Dwi Cahyani Octavianti, ²Lourenzita Nur Kencana Dewi, and ³Desi Susanti
¹Faculty of Humanities Universitas Airlangga, ²Faculty of Pharmacy Universitas Airlangga

INTRODUCTION



Children is the main part of country future



Children who are raised well by their parents will have more opportunity to get achievement than others

Raising children is the main part of the family task, especially mother

Now days, women are promoted to work in case for supporting family income



Indonesia is biggest exporter of low position in working such as house assistant, baby sitter, and labor. Most of them are women [1]

RESEARCH DESIGN

1



Observing places for tourism, society, and their job.

Natural Places: mountain, beach, waterfall, hill, cave, lake, museum, and temple.

They have beautiful scenery, but some of them do not have good road.

Society and their job: Society around who usually have not certain job, they will take part as the parking staff or food seller

2



Discussing with society and youth about this program.

It can be found that society needs forum to deliver their thoughts and problematic of their life including job, income, and social life. It shows that society wants to solve their problem by offering new opportunity without leaving their family.

Some youth from Tulungagung usually study in the big city such as Surabaya, Malang, Yogyakarta, etc. for example FORMASTA (Forum Mahasiswa Tulungagung se-surabaya), FORASTA (Forum Alumni SMK se-Tulungagung di Malang), and FAMI (Forum Komunitas Mahasiswa Tulungagung se-Indonesia). This community will take part in promoting and informing the up to date nowadays and giving some ideas.

3



Making project proposal to government and company about tourism, food, souvenir, and transportation.

Explaining the benefits that will be got such as decreasing jobless, children can be raised by their own mother, preventing divorce because of cheating and nursing children like single parent, and developing tourism places.

4



Training the society and youth for having good quality and capability in doing job desk.

People will be divided into some parts of tourism staffs:

- management trainee
- seller
- tour guide
- IT staff
- accommodation and transportation
- art culture performance.

They will organize and control the development of the program.

5



Making website to promote the tourism package

Website offer: places to stay, camp, staying with society, or hotel.

Destination: there are some pictures and the explanation about the place itself including history and the distance of each destination

Transportation: visitor can choose what they want to use such as bus, car, motorcycle, bike, or pedicab

Food: visitor can choose what kind of food they want to eat based on the price, and the place where they eat, or picnic package, so they can bring the food and eat in the tourism place.

6



Doing the program

IMPACT

Based on *Dampak Migrasi Internasional Terhadap Keluarga dan Anak yang Ditinggalkan: Studi Kasus Indonesia* (Yeoh, et al. 2016), there are several effects toward children because they are not raised by their parent, especially mother [2].

The positive impact is increasing family income. Besides, the negative impacts are more than the positive such as "emotional problem, behavior, and hyperactive" (Yeoh, et. al. 21) [2].

Children who have emotional problem cannot control their feeling and force people around them to fulfil what they want. Relative usually spoil by money that their mother earns by working abroad.

OBJECTIVES



- Children do not learn from their parents to have good attitude because people around them only keep them to not cry
- It makes them hyperactive because they want to get attention from people around
- Because of this problem, there must be a solving problem which can make mothers raise their children but still can support family income by using human resource and nature resource around



The problem that is broaden toward children because of less mother attention supported by another statement. Working in separated place makes couple to have more problem. The usual problem are affair and divorce (Janeko, 2011) [3]



Tulungagung is the place that writer choose to be the object of research because it has beautiful natural places to be explored and human resource to organize it. Some beautiful places that can be explored in Tulungagung are mountain, beach, waterfall, hill, cave, lake, museum, and temple. Another things that can be explored are food, souvenir, and art culture

RESULT

The results of this program are decreasing jobless, children can be raised by their own mother, preventing divorce because of cheating and nursing children like single parent, and developing tourism places



CONCLUSIONS

Through this program, people in Tulungagung can earn more money without leaving their family. The results of this program are decreasing jobless, children can be raised by their own mother, preventing divorce because of cheating and nursing children like single parent, and developing tourism places



THE DYNAMICS OF CHINESE LANGUAGE STUDIES IN VIETNAM'S UNIVERSITIES

TRAN THI XOAN

PRIDI BANOMYONG INTERNATIONAL COLLEGE, THAMMASAT UNIVERSITY

INTRODUCTION



Photo's source : Cited from the work "Pattberg: Global Language should adopt Chinese concepts

Vietnam-China bilateral cooperation has opened opportunities for Chinese language studies in Vietnam. This article provides an insight to the case of Vietnamese students majoring in Chinese language studies in Vietnam's universities by applying the theory of Economics Utility of Foreign Language Study indicated the two country economic interdependence indicators, primarily from China into Vietnam. The research is expected to be a reliable reference for related topics and draw a picture of Chinese language studies' situation in Vietnam's universities under the umbrella of Chinese emerging presence in Vietnam.

- ✓ Topic of China's rise and its flow of language and culture has been attractive numerous of studies
- ✓ Due to geographic proximity location with China, Chinese language has appeared in Vietnam in the very early period – 111 BC. However, the value of its language play different function is its distinct periods. China's rise and its economic steps into globe leads to a new phenomenon "language of necessity" or "new learners benefiting from Chinese economic expansion"
- ✓ Vietnam is not an exception when the flow of Chinese capital into Vietnam in terms of trade and investment since the Normalization of the two countries
- ✓ Case of Vietnam, from students' perspectives, how do they perceive Chinese language studies after China – Vietnam Normalization, 1991?

OBJECTIVE

- ✓ The paper is designated to understand how Chinese economic presence plays an important and dominant role in influencing on students' choices
- ✓ The objective of the paper is to understand the motivation, Attitudes of Vietnamese students in their universities toward Chinese language studies, in particular, emphasizing the choice and utility of Chinese and their motivation for Chinese language learning

RESEARCH DESIGN

- ✓ The paper is an empirical and explorative paper which comprises an Introduction with brief explanation for pursuing this topic, the body of the study bring the situation of Chinese language studies in Vietnam, economic relation in terms of economic interdependence, important contextual consideration. After ward, it focuses directly on the empirical study conducted in Ha Noi University, Vietnam with 114 informants with its description for Chinese language and its implication for cultural expansion. The final conclusion draws the paper's author judgment on a vision for Chinese language in Vietnam
- ✓ Definition of terms: "Chinese languages", "Economic Utility"
- ✓ Theories applied: Economic Utilities of Foreign Language study

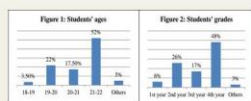
RESULTS

Respondent characteristics:

Among the respondents, 105 (92.1%) are female and 9 (7.9%) are male. Within 114 participant, 102 (89.5%) were born in the North, and 12 (10.5%) were born in the Central of Vietnam. Meaning that, the university has a source of student's intake differently. Ha Noi University establishes in the North - capital leading to a prominent numbers of Northern- borne students.

Analysis of results:

#1 Decision – making to engage with Chinese Language studies



The respondents almost go to school right as their comparable ages of Vietnamese students or supposed that they successful pass the National Entrance Exam in their first round. In other words, Chinese language courses are chosen within their first race. Regularly, Vietnamese students often begins their undergraduate period at the age of 18-19 according to the Vietnam National Education System.

#2 Influential factors in students choices

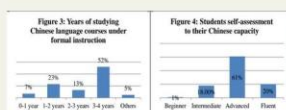
Interestingly, students have not posed much difference in picking the Chinese language's department. Meanwhile opportunities for employment hubs (65.8 %) and upgrading competitive advantage related to graduate student's profiles (33%) are the most selected explanation; their hobbies should be taken into consideration in accounting for 45.6%. Additionally, 69.3% intends to work within Vietnam compared to 30.7 % preferring abroad environment. It is understood by the domestic labor market plays the primary source of career fairs. Accordingly, students show their belief in the Chinese language trend related to career hub. Especially, 77% strongly agree or agree in the developing trend of employment's opportunity and 86.8% are positive or strongly positive in Chinese language utility in the future.

Among them, significantly 74 respondents are taking up part-times jobs which are close to language use. Several job titles are respectively high-chosen as Chinese language tutoring, translator & interpreter, movies decoder, tourist guides, waiters in Chinese restaurants, or sellers in Chinese supermarkets.

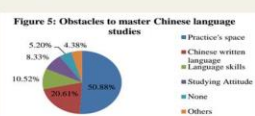
#2 Cost (time + obstacles) in mastering Chinese language studies academically

Respondent reveals (Figure 3) that their major knowledge and skills are instructed formally from universities. In other words, the human recourses are trained within the university's program.

Therefore, the curriculum plays important roles in filling students' capacity.



Economic utility on studying Chinese language can be interpreted as being invested personal cost for fruitful utility. Time and expenditure spent on learning a language would equip and progress students with long-term satisfaction in language's capacity and its application for future career.



RESULTS (continued)

Most of the students met difficulties in learning Chinese language. Given explanations attributes to environment to practices, Chinese written language, language skills and studying attitude. Only 5.2% of respondents are confident in this language.

#4 Chinese language as bridge for cultural perception

As language plays key role in transferring mutual knowledge, Chinese culture is depicted to be pervasive into the Vietnamese society. The survey reveals highly concern of students into Chinese culture contributed by 93% of the respondent. Students consider Chinese mass media materials such as TV programs, game-shows, radio-news and Chinese songs as sources for improving Chinese language capacity and regularly reading Chinese news (26.3%), accessing extra specialized references (30.7%) and writing diary in Chinese (11.4%). It is understood in an increase of the number of Chinese novels translated into Vietnamese recently, for instance.

CONCLUSION

To sum up, the paper concludes that Chinese rise in Vietnam regards to Chinese economic interdependence with Vietnam has been proved positive impacts on students' opportunities assessing career hub. In other words, Chinese flourishing presence is one of the most important determinants toward the student's choices towards Chinese language studies in Vietnam's universities. However, the paper is far from perfect. It would be recommended if the author can investigate and conducts much in-depth interviews with some other components such as the departments' administration or the recruitment board of companies.

REFERENCES

- Bui, H. (2005). Cơ cấu ngoại ngữ trong nền giáo dục Việt Nam - The Structure of Foreign Language Studies in Vietnam' education. *European Studies Review*, 4.
- Cheng, J. (2011). Sino-Vietnamese Relations in the Early Twenty-first Century. *Asian Survey*, 51(2), pp.379-405.
- Gil, J. (2009). The Promotion of Chinese Language Learning and China's SoftPower. *Asian Social Science*, 4(10).
- HIEP, L. (2017). *LIVING NEXT TO THE GIANT*. 1st ed. [S.I.]: INST OF SOUTHEAST ASIAN.
- Hodge, B. and Louie, K. (2012). *Politics of Chinese Language and Culture*. 1st ed. Hoboken: Taylor and Francis.
- Kumaravadivelu, B. (2012). Global Mandarin: Promoting Chinese language and culture in an age of globalization. *Chinese Language Studies*, 8, pp.1-6.
- Kurlantzick, J. (2008). *Charm offensive*. 1st ed. New Delhi: Oxford University Press.
- Nguyen, V. (2015). Confucius Institutes in the Mekong Region: China's SoftPower or Soft Border?. *Issues & Studies*, (4), pp.85-117.
- Nolan, P. (2014). *Is China buying the world?*. 1st ed. Cambridge: Polity Press.
- Shambaugh, D. (2014). *China goes global*. 1st ed. Oxford: Oxford University Press.
- Sidel, M. (1995). The Re-emergence of China Studies in Vietnam. *The China Quarterly*, 142, p.521.
- Tatarski, M. (2017). *The good, the bad and the ugly of Chinese tourists in Vietnam*. [online] South China Morning Post. Available at: <http://www.scmp.com/week-asia/society/article/2058279/good-bad-and-ugly-chinese-tourists-vietnam> [Accessed 18 Apr. 2017].
- The Chinese Tourist Boom. (2015). *The Asian Consumer*. [online] The Goldman Sachs Group, Inc. Available at: <http://www.goldmansachs.com/our-thinking/pages/macroeconomic-insights-folder/chinese-tourist-boom/report.pdf> [Accessed 18 Apr. 2017].
- Van Chinh, N. (2015). China's "Comrade Money" and Its Social-Political Dimensions in Vietnam. *Impact of China's Rise on the Mekong Region*, pp.53-84.



Application of Banana Tuber Flour and Rice Bran Flour in Biscuit Crackers



Nova Solina Purba, Bernatal Saragih, Hadi Suprpto

Food Technology, Technology Faculty, Khon Kaen University, Thailand

Agricultural Product Technology, Agricultural Faculty, Mulawarman University, Indonesia

Abstract

Food diversification has generally been driven by current challenges to reduce import of wheat. Banana tuber and rice bran have potentials exceptionally as an alternative food and/or functional food due to containing high nutritious; fiber, fatty acid, amino acid, antioxidant properties. The American Cancer Society, The American Heart Association, and The American Diabetic Association suggested consuming foods with high fiber 20-35g/day or 10-15g/1000kcal. The research aimed to determine the chemical compositions of biscuit crackers containing banana tuber and rice bran flour and their consumer acceptance by hedonic method.

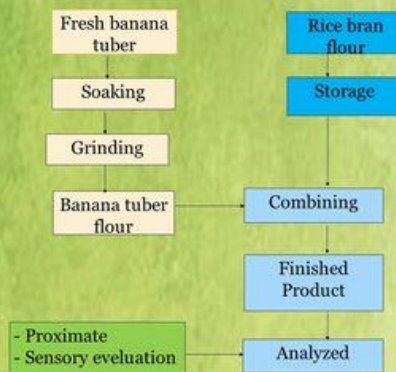
The research has 5 different concentrations of banana tuber and rice bran flour; 100%:0%, 75%:25%, 50%:50%, 25%:75%, 0%:100%. The results showed that the ratio of banana tuber flour and rice bran flour had significant effect on the moisture, ash, and crude fiber contents, and sensory values. However, it did not significantly affect total soluble solid contents. Crackers made by banana tuber and rice bran flours (50%:50%) showed the best sensory responses of hedonic score (taste, flavor, color and texture).

Keywords: Food diversification, Banana Tuber Flour, Rice Bran Flour, Biscuit Crackers

2. Chemical and reagents

Sodium metabisulphite ($\text{Na}_2\text{S}_2\text{O}_5$), sodium bicarbonate (NaHCO_3), sodium hydroxide (NaOH), Sulfuric Acid (H_2SO_4), Methanol 95%, and whatman filter paper no.1.

3. Sample preparation and analyze



Sample preparation and analyze

4. Statistical analysis

All the experiments were performed at least two independent times. Each independent time was conducted with three replications. Experimental design of this research using complied randomized design (CRD) with One-way analysis of variance (ANOVA) test, and Duncan's multiple range test was used to compare the mean values.

RESULTS

5. Proximate compositions

The results showed that the ratio had significant effect on the moisture and crude fiber contents values. However, it did not significantly affect ash and total soluble solid contents. The proximate compositions; moisture content, ash, and crude fiber of biscuit crackers are presented in figure 1 & 2.

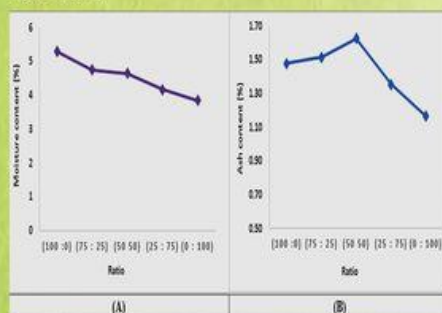


Figure 1. Response for the effect of ratio banana tuber and rice bran flour on moisture content (A), ash content (B)



Figure 2. Response for the effect of ratio banana tuber and rice bran flour on crude fiber (C), total soluble solid (D).

6. Sensory evaluation

The results showed that the ratio had significant effect on the hedonic values of taste, color, flavor and texture. The result of sensory evaluation of biscuit crackers are presented in table 1.

Table 1. Response for the effect of ratio banana tuber and rice bran flour on hedonic value

| Hedonic value | Ratio of banana tuber flour with rice bran | | | | |
|---------------|--|----------------|----------------|----------------|---------------|
| | (100 : 0) | (75 : 25) | (50 : 50) | (25 : 75) | (0 : 100) |
| Taste | 3.00 ± 0.00 a | 3.00 ± 0.00 a | 5.00 ± 0.00 b | 4.67 ± 0.57 bc | 4.00 ± 0.00 c |
| Color | 3.00 ± 0.00 a | 3.33 ± 0.57 a | 4.67 ± 0.57 b | 4.67 ± 0.57 b | 6.00 ± 0.00 c |
| Flavor | 4.00 ± 0.00 a | 4.00 ± 0.00 a | 5.00 ± 0.00 b | 4.67 ± 0.57 bc | 4.00 ± 0.00 c |
| Texture | 3.33 ± 0.57 a | 3.67 ± 0.57 ab | 4.33 ± 0.00 ab | 4.67 ± 0.57 ab | 5.00 ± 0.00 b |

Mean value ± standard deviation of triplicate

Mean value with different letters (a, b, etc) within the same column are significantly different ($p < 0.05$)

DISCUSSION

The moisture and ash contents of all ratios were in the range of 3.83-5.29g/100g and 1.35-1.62g/100g respectively. Moreover, for crude fiber varieties were in the ranges of 3.25-26.46g/100 g, respectively. However, there was no significant difference total soluble solid content with the range of 13.33-16.67°Brix/5g, respectively.

According to the results from each parameter, the ratio of banana tuber flour (100:0) generally demonstrated higher than rice bran flour. However, the ratio of banana tuber and rice bran flour (50:50) in the biscuit cracker model was the most acceptable for all hedonic value.

In this study, the effectiveness of banana tuber and rice bran flour for making biscuit crackers depend on the both materials. Changes to the product quality during extrusion primarily depends on the raw material properties (composition and moisture content). As different ripening stages of banana poses varied amounts of starch and sugars in the composition, it might lead to variation for acceptable quality products.

CONCLUSION

Crackers made by banana tuber and rice bran flours (50:50) had significant effect on the moisture, ash and crude fiber contents, and showed the best sensory responses of hedonic score (taste, flavor, color and texture).

REFERENCES

- Goffman, F.D., S. Pinson dan C. Bergman. 2003. Genetic Diversity For Lipid Content And Fatty Acid Profile In Rice Bran. dalam: *J Am Oil Chem Soc* 80: 485-490.
- Zhimin, X and J.S. Godber. 1999. Purification and Identification Of Components Of γ -oryzanol In Rice. *Journal Agric. Food Chem* 47: 2724-2728.

The 5th Asian Academic Society International Conference
(5th AASIC 2017)
Vvish Hotel, July 26-27, 2017
Khon Kaen, Thailand

INTRODUCTION

Part of the banana that is often harvested viz., banana rind, banana leaf, fruits, and stems. However, other great part of wasted and rejected from banana is peel and tuber. Pratama et al. (2011) proved that the banana peel extract has flavones, flavonols, flavanones, and polymethoxy flavones which have the potential to be phytoestrogens. Banana tuber is a farm waste that might be applied into flour and minimizing wastes and reducing import of wheat.

On the other hand, rice bran also contains many bioactive compounds, such as antioxidant which is responsibility for human health (Zhimin dan Godber 1999). Numerous studied have published the beneficial health properties of rice bran oil, including phenolic compounds, bioactive compounds and antioxidant (Goffman et al., 2003).

Further research demonstrated both ability of banana tuber and rice bran flour might be developed as alternative of natural product and functional food.



OBJECTIVE

The objective of this study was to determine the chemical compositions of biscuit crackers containing banana tuber and rice bran flour and to evaluate the effectiveness of combination for consumer acceptance by hedonic method.

RESEARCH DESIGN

1. Materials

Banana tubers were obtained from farmer that located in Samarinda, Indonesia. Rice samples, cultivar IR60, were grown in Tenggarong, Indonesia where rice bran is provided by Rice Process Unit (RPU) factory in Tenggarong, East Kalimantan, Indonesia.

Acceptance of Elementary School Children on Tilapia Fish and Sardinella Fish Flour Based Biscuits

Slamet Widodo^{1*}, Saifuddin Sirajuddin², Filianova¹, Nahriana¹

¹Family Welfare Education, Universitas Negeri Makassar

²Hasanuddin University

Macassar, Indonesia

*taufiqnurramadhan@yahoo.com

INTRODUCTION

Due to the uncontrollable increase in the world population today, food innovation is direly needed to balance the needs of the population. The availability of required foods must satisfy the adequacy, both in quantity and quality. High-quality food material will support the achievement of qualified human resources, and ultimately will accelerate the settlement of issues arising in the community [1][2]

The availability of foodstuff around that has not been utilized fully is freshwater fish (tilapia fish/*Oreochromis mossambicus*), and saltwater fish (sardine/*Sardinella aurita*) [3][4]



1. Easy to obtain and easy to find in the market, relatively cheap prices
2. High nutritional value (especially protein, calcium, zinc, and iodine) [5], [6]

The fact is, in the community, those two ingredients are not being utilized fully even though the nutrition, amount, and price of that ingredient are very affordable, but the bones are very risky to be consumed directly, especially for sardines [1]

a formulation of high nutritional additional meal in biscuit form by utilizing tilapia fish and sardines are needed

Biscuit has advantages, such as small size, the shelf life is relatively long, and well received by the community

OBJECTIVE

This study aimed to analyze the acceptance of Tilapia fish and Sardinella fish flour based biscuit

RESEARCH DESIGN

Material

The main ingredients in the study were wheat flour, cornstarch, tapioca starch, tilapia fish flour, Sardinella fish flour, yolk, sugar, vanilla extract, and baking powder..

Research Phase

- The first → a recipe standardization,
- The second → biscuit formulation process by using the chosen recipe.
- The third → the choosing of biscuit formulation to get the best formula,
- The fourth → phase is the student's approval on the best biscuit and the comparison with biscuit control.

Data Collection

The data for recipe standardization is collected based on the standard biscuit quality after the formulation of the amount and the biscuit ingredient. Standard biscuit quality uses seven hedonic quality scale by the quality of color indicator (very dark-very light), aroma (fragrant – not fragrant), texture (very hard-very soft), and taste (very tasty-not very tasty), as well as the overall quality of the biscuits (very good-not very good) [1]

Data Analysis

Data analysis used in this research is Kruskal-Wallis by analyzing the biscuit quality value (color, aroma, texture, taste, overall, and favorite) given by trained panelist and target panelist, and elementary school student of SD Lamasi for targeted organoleptic test panelist

RESULTS

The research result includes the first phase (recipe standardization), the second phase (biscuit formulation), the third phase (choosing best formulation), and fourth phase (approval of elementary school student on best biscuit).

Table 1. Biscuit recipe standardization and Formulation

| COMPOSITION | PHASE 1 | | | | | PHASE 2 | | | | | PHASE 3 | | | | |
|-----------------------|---------|-----|-----|-----|-----|---------|-----|-----|-----|-----|---------|-----|-----|-----|-----|
| | Q1 | F10 | F15 | F20 | F25 | F30 | F35 | F40 | F45 | F50 | F55 | F60 | F65 | F70 | F75 |
| Wheat flour | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| Cornstarch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tapioca starch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tilapia fish flour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sardinella fish flour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Margarine | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Yolk | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Sodium bicarbonate | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Total (g) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Table 2. Modus, Panelist's percentage, and Mean rank of biscuit approval

| Indikator | FA | F10 | F15 | F20 | F25 | F30 | F35 | F40 | F45 | F50 | F55 | F60 | F65 | F70 | F75 |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Color | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |
| Aroma | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |
| Texture | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |
| Taste | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |
| Overall | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |
| Preference | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) | 40(2.9) |

Remark: Superscript letter on the same row does not show any difference

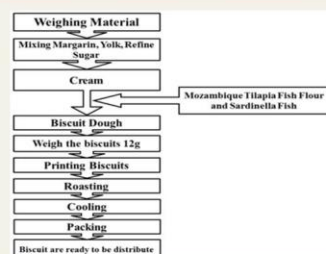


Figure 1. Biscuit Production Process

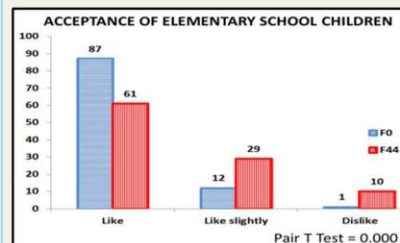


Figure 2. The Reception of Elementary School Students toward selected biscuits

CONCLUSION

The reception of elementary school students toward nutritious tilapia fish flour and sardine flour based biscuit started with recipe standardization, biscuit formulation, biscuit reception, and the level of preference by elementary school students toward biscuits. Standardized recipe (F0) generated is 47 gr of flour, 30 gr of wheat, 10 gr of corn starch, 7 gr of starch, 12 gr of margarine, 29 gr of egg yolk, and 12 gr of powdered sugar. The selected biscuit formulation (F44) is with the addition of 1 gr of tilapia fish flour, 3 gr of sardine fish flour, and other ingredients such as 28 gr of flour, 9 gr of corn starch, 6 gr of starch, 12 gr of margarine, 29 gr of egg yolk, and 12 gr of powdered sugar. The preference level of elementary school students toward the selected biscuits in the category of favorable reached the number of 61%, showing that the biscuit is well received by elementary school students

ACKNOWLEDGMENT

We would to acknowledge Ministry of Research, Technology and Higher Education for the funding through doctoral research scheme program 2017

REFERENCES

- [1] S. Widodo and S. Sirajudin, "Effect of Drying Time on Quality of Mozambique Tilapia Fish (*Oreochromis mossambicus*) and Round Sardinella (*Sardinella aurita*) Flour," in *International Conference ADRI - 5* ("Scientific Publications toward Global Competitive Higher Education"), 2017, pp. 157–163.
- [2] K. Putranto, Asikin, "Karakterisasi Tepung Tulang Ikan Belida (*Chitala SP.*) sebagai Sumber Kalsium dengan Metode Hidrolisis Protein," *ZIRAAAH*, vol. 40, no. 2015, pp. 11–20, 2015.
- [3] O. O. Oluwaniyi, O. O. Dosumu, and G. V. Awolola, "Effect of Cooking Method on the Proximate, Amino Acid, and Fatty Acid Compositions of *Clarias gariepinus* and *Oreochromis niloticus*," *J. Turkish Chem. Soc. Chem. Assoc.*, vol. 4, no. 1, pp. 115–132, 2017.
- [4] C. Kiel and C. Chaboud, "Profitability and economic drivers of small pelagic fisheries in West Africa: A twenty year perspective," *Mar. Policy*, vol. 76, no. February, pp. 152–158, 2017.
- [5] S. T. Abbarra et al., "Replacement of fishmeal with processed meal from knife fish *Chitala ornata* in diets of juvenile Nile tilapia *Oreochromis niloticus*," *Aquac. Reports*, vol. 4, no. 76–83, 2017.
- [6] C. Kiel and C. Chaboud, "Profitability and economic drivers of small pelagic fisheries in West Africa: A twenty year perspective," *Mar. Policy*, vol. 76, no. February, pp. 152–158, 2017.



**"Multidisciplinary Perspective of Local Wisdom:
Past, Present, and Future of ASIA"**

**Copyright © & Published by Mr Agianto (5th AASIC)
Edition & Year: 1st Edition, July 2017**



978-616-440-849-4