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**International Centre for  
ASEANA Management**

**ICMAC CONFERENCE  
PROCEEDINGS 2019:  
VOLUME 3**

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International Centre for ASEANA Management  
Singapore  
Singapore

ISSN 2705-067X  
ICMAC Conference Proceedings (Book of Abstracts) 2019: Volume 3

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# **8<sup>th</sup> International Conference on Managing the Asian Century: From Smart Cities to Future Cities**

**Bali, Indonesia, 15-16 November 2019**

**Hosted by**

**International Centre for ASEANA Management**

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This volume presents peer-reviewed abstracts presented during the International Conference on Managing the Asian Century 2019 held in Bali. The proceedings of these conferences include original papers contributed by researchers covering multi-disciplinary areas such as management, education, organizational development, climate change, financial and economic planning and other areas significant to socio-cultural, environmental and economic development.

### **Aim of the International Conference on Managing the Asian Century (ICMAC)**

ICMAC is built on the successes of previous conferences in Surabaya (2018, Innovations and Technology for Sustainable Development), Xiamen (2018, Linking One Belt One Road with Smart Biotech), Bali (2017, Smart Innovations for Smart Cities of East Asia; 2014, Integrating ASEAN), Singapore (2016, Rise of Smart Cities in Asia; 2013, Managing the Asian Century), Kuala Lumpur (2015, ASEAN Entrepreneurs in Technology). The seven conferences brought together international investors, Asia and US inventors and innovators, and representatives of Asian governments. The participants came from incubation hubs of Asia, research think-tanks of Europe, and the Silicon Valley USA.

The theme of ICMAC generally hosts a gathering of like-minded people: international and Asian academics, innovators and representatives of governments. Information technologies and their influences in industry, government and policy planning will be the focus. Digitization trends (past, present and future) will be of particular interest to the participants. The focus is on how Asian nations collaborate on developing inventions and digital innovations for growth across Asia.

We welcome contributions that draw upon contemporary ideas and developments in practices of management, education, organizational development, climate change, financial and economic planning and other areas significant to socio-cultural, environmental and economic development.

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## **Introduction: Smart Cities and Future Cities in Asia**

John Vong

International Centre for ASEANA Management, Singapore

Asia-Pacific retains its reputation as a dynamic growth region for 2019, with ADB projecting a 5.6% growth that will account for approximately 65% of global growth. However, ageing populations, slowing productivity growths and the 4th Industrial Revolution, coupled with the rise of protectionism, geopolitical tensions and cybersecurity threats mean that Asia-Pacific nations require long-term, sustainable policies to stay on their growth trajectories. Increasingly, smart city technologies are adopted by Asian governments, with an estimated \$63.4 billion to be invested between 2014-2023 according to Navigant Research. Experts from ADB, IMF, UN, World Bank and Asian governments believe that innovative collaborations utilising renewable energy, big data analytics, IoT and smart urban planning are key to the long-term development of Asian smart cities of the future. The International Conference for Managing the Asian Century (ICMAC) series shares how we can partner to create new models in sustainable growth of nations in the Asian century.

ICMAC 2019 is built on the successes of previous conferences in Surabaya (2018, Innovations and Technology for Sustainable Development), Xiamen (2018, Linking One Belt One Road with Smart Biotech), Bali (2017, Smart Innovations for Smart Cities of East Asia, 2014, Integrating ASEAN), Singapore (2016, Rise of Smart Cities in Asia; 2013, Managing the Asian Century), and Kuala Lumpur (2015, ASEAN Entrepreneurs in Technology). The seven conferences brought together international investors, Asia and US inventors and innovators, and representatives of Asian governments. The participants came from incubation hubs of Asia, research think-tanks of Europe, and the Silicon Valley USA.

The theme of ICMAC 2019 – From Smart Cities to Future Cities – hosted a gathering of like-minded people: International/Asian academics, innovators and representatives of governments. Information technologies, food/agricultural science, engineering/business innovations, curriculum design, student pedagogical assessments and their influences in industry, government and policy planning would be the focus.

## Chapter 1

### Stimulating Early Childhood's Cognitive Development Using Traditional Games

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Universitas Negeri Surabaya, East Java, Indonesia

**Abstract** - Cognitive development is one of the most important developments to be stimulated early on. Stimulating cognitive development can be done through various play activities, one of which can be done by playing traditional games. Indonesia is a country, full of cultures and islands which have a variety of customs and traditional games such as "*engklek*", to stimulate children's cognitive development, because this game is interesting and fun, in addition to preserving the nation's culture which got to be not popular, because of modern games. This study aims to find out traditional games to stimulate cognitive development in children aged 5-6 years. The study design uses the pretest posttest Equivalent Group Design; experimental and control groups using the experimental method with quantitative approaches as well as observation data collection techniques and instrument rating scale models 1-4, Mann Whitney test that aims to determine the difference in the pretest and posttest score. The subjects of this study were 60 children in kindergarten. The the experimental group was given treatment for 8 times using traditional game "*engklek*". The results showed that traditional games can be used to stimulate cognitive development of children aged 5-6 years where an average score and the level of significance in cognitive development at pretest at 0.671, posttest at 0,000. It was concluded that the pretest score was more than a significant level of 0.05, meaning there was no significant difference in the pretest between the experimental and control groups. Whereas the posttest score obtained Asymp value. Sig. (2-tailed) of 0,000 was less than 0.05, meaning that that there is a significant difference in the post-test scores between the experimental and control groups in the cognitive development of children aged 5-6 years.

**Keywords:** simulation, cognitive development, traditional games



## 1. Introduction

Early childhood grows and develops rapidly in the early years, optimally through the learning process. Tuti Andriani (2012) states that superior human resources are the most valuable assets for any country. Indonesia has the 3rd largest population and human resource potential. The empowerment of good human resources can improve the welfare of people. One of the government's efforts to empower human resources is through implementing professional education, especially Early Childhood Education (PAUD) program.

Playing is a children's world because they can learn various things about their environment. According to Hasibuan Rachma (2016) states playing is the best way for children to develop their abilities as well as their potential development. The Early Childhood (EC) is sensitive period that requires stimulation on certain functions to optimize their development in the future.

Children aged 5-6 years are children at the Kindergarten level, where they need to be exposed more on language, physical, cognitive development through a variety of games. The suitable game for children aged 5-6 years individual and collective games are outdoor, both at the schoolyard and home yard. principally, the early childhood learning is done through play, because it indirectly prepares children to enjoy learning.

Playing for children is not only to have fun but also as a learning tool to develop their aspects of development, especially in cognitive development. Teachers and parents need to prepare an environment of play activities that are meaningful, safe, comfortable, attracting children's interest in learning and creating an atmosphere that invites playful excitement so as to encourage children to learn (Paramita, 2017:192).

The surrounding environment for the children is like the third teacher that they learn to know the world in their own way. The role of the teacher and parents is very important in stimulating child development. Cognitive development (power of thought) at the age of 5-6 years is very rapid, shown by the children's extraordinary curiosity on their environment. Elmanora et al (2017) and Slavin (2010) argue that children build cognitive abilities through their interactions with the world around them. The Gathercole et al (2003) show that children aged 4-6 years can organize cognitive abilities only in short-term memory.

The early childhood learning is characterized from the combination of children's learning and the needs of playing using specific instrument (Haenilah, 2015: 74). Children learn gradually from the concrete to abstract. children play kinds of games using educational game equipment to be explored. The game equipment does not have to be good and modern but fulfills the educational

requirements such as 40% of sensory motor, 20% of symbolic and 40% development (Haenilah, 2015: 102).

The process of early childhood learning through playing towards an integrated pedagogical approach is an activity initiated by the teacher and children to produce free and structured play. A comprehensive pedagogical play reflects activity of playing while learning, interacting with children in the range of activities, observing, pondering, evaluating, and returning to the planning initiated by the teacher.

Understanding symbols is the same as understanding the concept of symbol numbers. Stimulating the understanding of the concept of number symbols in children from an early age is very important to be able to think logically and systematically through observing concrete objects, images or numbers in their environment (Paramita, 2017). They have to think logically in classifying objects by color, and symbolic thinking in recognizing the concepts of numbers and symbol numbers. According to Hasibuan Rachma, Nur Ika Sari Rakhmawati, (2017) that learning activities to improve cognitive abilities of children aged 5-6 years can be done by recognizing the concept of geometric shapes through playful fun. From the description above, it can be concluded that the teacher can stimulate the cognitive development of children through games that use educational game equipment, besides that the teacher also needs to prepare the learning process well.

There are various traditional games in Indonesia, one of them is "*engklek*". The children jump while counting the numbers written on the flat plain of the game and can be played by 2-5 children. The game can improve not only children's strong physical by jumping activity but also develop their brain. The children can learn to socialize with others, and teach togetherness, learn to be discipline to the rules of the game, develop intelligence, and practice counting to determine the steps that must be passed. Through this traditional game, "*engklek*", children can be stimulated from the beginning through the numbers played. For this reason, researchers are interested in studying traditional game "*engklek*" as an alternative problem-solving in the learning process to stimulate the cognitive development of children aged 5-6 years that is in accordance with the development and needs of children.

## **2. Literature Review**

### **2.1. Play And Children's Play**

Play is a media for children to gain experience, through fun and meaningful ways for children to remember. Play is a direct or spontaneous activity (Latif,

2013: 77). Where children will practice interacting with other people, objects, numbers around them. while, games are designed activities to improve children's certain abilities based on learning experiences. Games are also a tool for children to explore their world that they do not recognize and accomplish.

Play is an important activity for children. Fun learning activities in kindergarten can be carried out through play activities and games. Games for children are activities that are very fun and contain educational value because through these games children learn to develop all aspects of development and play as a place to express how children feel. Playing in an atmosphere without pressure and force is the most enjoyable way of learning for children. Teaching techniques through games are very effective in explaining an abstract understanding and concepts that are difficult to explain with words aimed at developing children's cognitive abilities. Various studies have also mentioned that playing has great benefits for children's development. Play is a learning experience that is useful for children.

## **2.2. The Importance of Stimulation for Children**

The quality of children's development in the future is largely determined by the stimulation they get early on. Cognitive stimulation is "the efforts of parents and teachers to optimize cognitive development by involving children in various play activities that can enhance children's learning activities (Tucker-Drob and Harden, 2012).

Providing educational stimulation for early childhood is very important considering where 80% of brain growth develops in children from an early age. The elasticity of early childhood brain development is greater from birth to before 8 years, the remaining 20% is determined for the rest of life after childhood. The stimulation provided must be in a way that is appropriate to the level of development, needs, and age of the child.

Early Childhood Development includes several aspects including physical growth and motor development, cognitive development, socio-emotional, language, moral religion. The development of all these aspects in their entirety comprehensively and continuously becomes a very significant thing. Stimulating children requires an understanding of the basic concepts related to the stimulation of cognitive development. Concepts, theories, and strategies are used to develop the basic abilities of early childhood, especially children's cognitive abilities.

### **2.3. Cognitive Development of Children Aged 5-6 Years**

The process of early childhood learning through playing towards an integrated pedagogical approach is an activity initiated by the teacher and children to produce the free, structured play. A comprehensive pedagogical play reflects playing activity while learning, interacting with children in the range of activities, observing, pondering, evaluating, and returning to the planning initiated by the teacher.

The late cognitive development will affect children's lives in the future. Pedro F. S. Rodrigues & Josefa N. S. Pandeirada, (2019), state that the environment around children also influences children. The ability to think that includes the process of capturing, connecting, assessing and considering a matter is indeed important. It is closely related to the cognitive that exists in each individual. No exception, in children.

The good cognitive ability is also useful to help children to think logically in life in the future community. Teachers and parents can prepare games by inviting children to do various activities at home and school. Through games, children are encouraged to be able to calculate what is done with great fun through play and games, because they can be confidently express opinions, explore, and learn to grow their cognitive abilities through play.

The cognitive development aspects in children aged 5-6 years consists of three development scopes, namely; 1) learning and problem-solving (getting to know objects based on functions, using objects, getting to know simple concepts, getting to know many concepts a little, creating things based on their ideas, observing objects, recognizing patterns of activities, understanding positions), 2) thinking logically (classifying objects based on functions, shape, color or size, recognizing the symptoms of cause and effect associated with them, classifying objects into groups of a kind, recognizing patterns, and sorting objects), and 3) thinking symbolically (mentioning many objects one to ten, recognizing the concept of numbers, recognizing symbols number). Understanding symbols is the same as understanding the concept of symbol numbers.

Stimulating the understanding of the concept of number symbols in children from an early age is very important to be able to think logically and systematically through observing concrete objects, images or numbers in their environment (Paramita, 2017). They have to think logically in classifying objects by color, and symbolic thinking in recognizing the concepts of numbers and symbol numbers. According to Hasibuan Rachma, Nur Ika Sari Rakhmawati, (2017) that learning activities to improve cognitive abilities of children aged 5-6 years can be done by

recognizing the concept of geometric shapes through playful fun. From the description above, it can be concluded that the teacher can stimulate the cognitive development of children through games that use educational game equipment, besides that the teacher also needs to prepare the learning process well.

#### **2.4. The relationship of Children's Cognitive Development Stimulation to Traditional Games**

One of the methods to increase early childhood's potential is through playing. The slogan in early childhood education is "*learning while playing, playing while learning*." This is the basis, that the game is one to explore the potential of children. One of the tools that can be used to play in early childhood education is traditional games because traditional games will help shape the character of early childhood (Tuti Andriani, 2012).

There are various types of traditional games in Indonesia, one of them is "*engklek*". In each region, this "*engklek*" has a different name. The origin of this game is found in various regions in Indonesia, like Sumatra, Java, Bali, Kalimantan, and Sulawesi, with different names. There are also those who call this game "*zondag-maandag*" originated from the Netherlands and spread to area of Indonesia in colonial times. Some call it "*teklek-ciplak gunung*", "*demplak*", "*tebrek*", and others. The terms mentioned are varied, but the game remains the same. In Aceh, it is called "*pacih*", in Riau it is called "*setatak*", in Jambi it is called "*tejek-tejekan*", South Sumatra is called the game "*Cak Ingking Gerpak*", in East Java there are those who call the game "*Odik*", and East Nusa Tenggara called "*Siki Doka*".

This traditional "*engklek*" game is played by jumping on a flat surface, drawn on ground or layer that can be played by 2-5 people. This game can be played both boys or girls as agreed by Zach et al. (2015) who say that no differences are found between boys and girls, it is explained that in order to successfully achieve the required tasks, physical integration and cognitive.

According to their research findings, Philipp Martzog, Heidrun Stoeger & Sebastian Suggate, (2019) indicate that cognition is based on the children's sensorimotor experience. Research shows that fine motor skills (FMS) are also related to cognitive abilities.

The players first make a "*suit*" or "*gambreng*" (a way to determine who come first in the game) to determine their turn. The player who win the first turn have to play first. this game is started by Simply jumping one foot and two feet in each of the plots previously described on the ground. To be able to play, each child must

have a "kereweng" or "gacuh" which is usually in the form of broken tiles, floor tiles, or flat stones or can also use a bag filled with corn seeds. The "kereweng/gacuh" is thrown into one of the plots drawn. the plots that have "kereweng/gacuh" may not be stepped by every player. So, the next player must jump to the next plot with one foot or two legs around the plots which are numbered in the plot.

The player whose "gacuh" (flat stone) reaches the last box, and then takes the card, will be the winner. But, it must be remembered, the "gacuh" or flat stone throw should not hit the line. When jumping,, the player should not step on the line. If player gets on the line, the player is lost and must repeat the game from the beginning. Developing aspects of cognitive development will be optimized through this traditional game. Based on the existing problems, this traditional game is used as a treatment in developing cognitive development, this game uses lyer sized 3 x 1 with bright colors and foot images as jumping marks in the box, while "gacuh" (throwing tool) used is seed bags as well as rule of the game. Related to this media also delivered by Vebrianto, Rian and Osman, Kamisah (2011) state that in the learning process media is one of the most important components in the learning process.

The steps in this research are beginning from throwing a seed bag into a box, jumping one leg, jumping two feet in a two-foot picture, throwing a seed bag, bending, and turning the body without falling. According to (Keen Achroni, 2012: 52) the step of traditional game "engklek" namely; (1) the player throws "gacuh" (throwing tool) into the plot, that must not exceed the existing box or square, (2) players jump around from one plot to another using one foot and two legs, ( 3) the plot/box which has "gacuh" may not be stepped on by every player. Then, the player takes a number card in accordance with the number to which the seed bag is thrown and player mentions the number taken, this is used to stimulate their cognitive development.

### **3. Materials and Methods**

This experimental research used a quantitative approach. Cresswel (2008: 60) states that:

*“Experimental designs (also called intervention studies or group comparison studies) are procedures in quantitative research in which investigator determines whether an activity or materials make a difference in results for participants”*

The quantitative approach was chosen to test a hypothesis of the relationship between research variables. The relationship of the independent variable and the dependent variable on the traditional game "*engklek*" to stimulate the cognitive development of children aged 5-6 years.

The design in this study uses the Equivalent Group Design pretest-posttest design, meaning that the control and experimental groups will be pretested in both groups first to find out the children's abilities. After that, the experimental group will be given treatment using the traditional game "*engklek*" while the control group is given programmed learning in the kindergarten. The research design can be seen in the table as follows;

Table 1. Research Design Table

<b>class</b>	<b>Pretest</b>	<b>Treatment</b>	<b>Posttest</b>
Experimental	O <sub>1</sub>	X	O <sub>2</sub>
Control	O <sub>3</sub>	-	O <sub>4</sub>

**Information:**

- O<sub>1</sub> : Results of pretest observation of the experimental group
- O<sub>2</sub> : Results of posttest observation of the experimental group
- O<sub>3</sub> : The results of pretest observation of the control group
- O<sub>4</sub> : Results of posttest observation of the control group
- X : The experimental group was given the traditional game "*engklek*"
- : Control group

The traditional game of "*engklek*" has lot of models and characteristics of how to play that is not the same in each region. The pictures below describe the model of traditional game "*engklek*" including as follows;

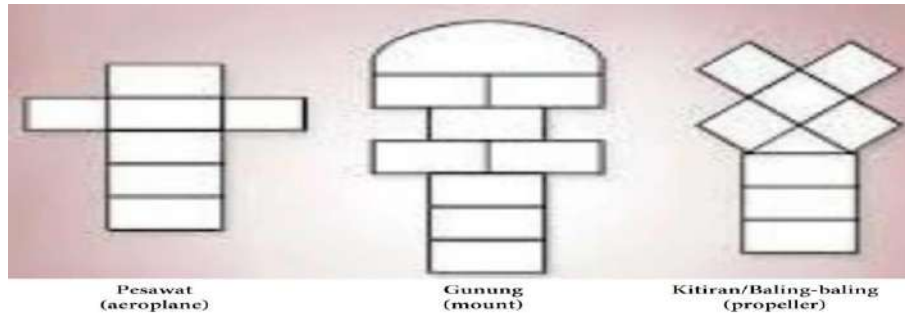


Figure 1. Models of traditional game "*Engklek*"



Figure 2. How to Play "*Engklek*"



Figure 3. The child plays another model of traditional game "*Engklek*"



Stimulating cognitive development of children aged 5-6 years, through the traditional game "engklek" is done through observation in the form of exercises. The table 2 and 3 below describes the lattice of cognitive development and the traditional game "engklek", as follows;

Table 2. Lattice Cognitive Development of Observation Sheet on Children Aged 5-6 Years

Variables	Level Of Development achievement	The Developed Indicators	The Question Items	Numbers Of Question Item	Item Number
Cognitive Development for children aged 5-6 years	Learning and problem solving	To recognize objects based on functions, use objects, recognize simple concepts, get to know many concepts a little, create something according to the idea, observe objects, recognize patterns of activities, understand the position	Giving rewards to children who can complete the game from the beginning to the end	2	1
			Recognizing number 1, 2, 3 and so on		2
	Logical thinking	Classifying objects based on function, shape, color or size, and recognizing cause and effect symptoms related to themselves, as	Taking the number of objects according to the number produced from seed bag throw		3

		well as classifying objects into similar groups, recognizing patterns, and sorting objects			
	Symbolic thinking	Mentioning many objects from one to ten, recognizing the concept of numbers, and recognizing symbols of numbers, and recognizing symbols of letters.	Mentioning the numbers on the box based on children's throw using seed bag		4

(Source: Ministry of Education and Culture Regulation No. 137 of 2014 concerning National Early Childhood Education Standards)

Table 3. Lattice Observation Sheet of Traditional Game "*Engklek*" for Children Aged 5-6 Years

Variables	Level Of Development achievement	The Developed Indicators	The Question Items	Numbers Of Question Item	Item Number
Traditional Game " <i>Engklek</i> "	Doing body movements to train flexibility, balance, and agility	one leg jumping	jump one foot on the box marked 1 right foot on the box layer	3	1
		two-foot jumping	jump using two feet on the box which has two right and left legs side by side on the box layer		2

		Bowing when picking up seed bags	bowing down without falling and taking seed bag		3
	Coordinate eye-foot-hand-head movements to jump one foot and two feet according to the picture in layer	Changing direction at the position of the body by jumping	Jumping on two feet together to rotate the body in the direction of the 2-foot picture in box	3	1
		Throwing a seed bag	throwing seed bags into a box the number 1, 2, 3 in the box (not on the line)		2
		jumping over the box with the seed bag inside	Jumping over boxes that have seed bags without falling over		3

The subjects of this study were 60 kindergarten children aged 5-6 years. Table 4 describes the research subjects as follows;

Table 4. Research Subjects

No	Class	The numbers students			Types of group
		boys	girls	total	
1	Kelas B1	14	16	30	controll
2	Kelas B2	17	13	30	Eksperimental
			<b>Total =</b>	<b>60</b>	

The subjects of this study were 60 children in one kindergarten in Indonesia, conducted in the even semester of the 2018-2019 academic year. The data were collected using observation and the validity of learning tools. This research instrument used rating scale measurement models 1-4.

The rating scale was scale used to collect raw data in the form of numbers and then interpreted quantitatively, as follows (see table 5): VGD is Very Good Development = 4; DAE is Developing as Expected = 3; STD is Start to Develop = 2; ND is not developed = 1 (Minister of Education and Culture Regulation: 2014:

19). The instrument in this study used observation guidelines combined with checklist (√) in the form of observation sheets of children's cognitive development.

Table 5. Guidelines of Learning Outcomes Evaluation

score	information
1	ND (not developed)
2	STD (Start to Develop)
3	DAE (Developing as Expected)
4	VGD (Very Good Development)

Ministry of Education and Culture Regulation (2014:19)

To determine the validation level of instrument, the writers asked help of experts. Therefore, after the instrument constructed on aspects measured based on theory, the next stage of the instrument was to consult the experts. An expert was asked for his opinion on the instruments, namely:

- 1) If  $t_{\text{observed}}$  is greater than  $t_{\text{table}}$  ( $t_{\text{observed}} > t_{\text{table}}$ ) then it is categorized as valid
- 2) ) If  $t_{\text{observed}}$  is smaller than  $t_{\text{table}}$  ( $t_{\text{observed}} < t_{\text{table}}$ ), then it is declared invalid (Sugiyono, 2012).

The reliability test was conducted through exercises, this instrument was also accompanied by a rubric assessment of the traditional game "*engklek*" for children aged 5-6 years. It was said to be reliable if the reliability coefficient obtained was at least 0.6 or 0.6 and above (Sugiyono, 2010). Instrument reliability testing used Cronbach's Alpha.

The decision making was based on:

- 1) If the Alpha value  $> r_{\text{table}}$ , meaning that it was categorized as reliable.
- 2) ) If the Alpha value  $< r_{\text{table}}$ , meaning that it was categorized as unreliable.

The normality test was conducted to know whether or not the data used in the study was normal; the Homogeneity test aimed to ensure that the groups being compared are homogeneous groups. The data were analyzed using non-parametric statistical analysis with the Mann Whitney test. The Mann Whitney test used statistical analysis to find out the average difference between two different samples. Hypothesis testing in decision making to compare the value of  $t_{\text{observed}}$   $t_{\text{table}}$  as follows:

1. if  $t_{\text{observed}}$  is greater than  $t_{\text{table}}$  or significance value  $< 0.05$ , meaning that  $H_a$  is accepted and  $H_0$  is rejected.
2. if  $t_{\text{observed}}$  is smaller than  $t_{\text{table}}$  e, meaning that  $H_0$  is accepted or a significance value  $> 0.05$ .

#### 4. Results

The results of this study describe the results of observations of children's cognitive development abilities through the traditional "*engklek*" game of children aged 5-6 years. The results of observations from the beginning to the end of the study were given to each control group and the experimental group with 30 children each. The experimental group given treatment used the traditional game "*engklek*" while the control group was the group that was not treated.

The total number of treatments given 8 times in the experimental group for 2 hours, the length of the game in one day is 2 hours for all experimental groups from the initial activity to the final activity while the control group follows the learning activities according to the schedule set by the teacher. The steps of the game:

Initial activities began with a large circle (cycle time), prayer before playing and learning, holding hands, singing and clapping children as well as the delivery of material and the rules of the traditional game "*engklek*". The initial activity lasts for 30 minutes.

The main activity is the teacher who demonstrates procedures of traditional game "*engklek*" in the form of layer 3 x 1 totaling 3 layers, played by 10 children in each group. Each child will play from the beginning to the end of the game for about 60 minutes (1 hour), each child plays 2 minutes starting from shaking hands before playing, throwing seed bags/jumping, jumping over the box, jumping one foot, jumping two legs, turning the body, bow, and line up in their posts in an orderly manner. All activities will be observed and assessed according to the instruments made by the teacher.



**Figure 4. The traditional "*engklek*" method, the initial activity**



**Figure 5. Traditional "*engklek*" method, core activities**

The final activity is a reflection activity that aims to find out whether each child can complete his game through question and answer and converse so that the results of observations in the form of collected data will be more objective. In the closing activity, the child will reveal all the contents of the mind that will be told to the teacher. This activity is in the form of communicating activities that have been carried out through question and answer as well as the teacher to strengthen the material and provide rewards and end with prayer.

The assessment of children's ability observations is carried out when the traditional game "*engklek*" is taking place. The next step taken is final observation. The process of conducting observations is carried out with the same activities as the initial observations in the form of activities to stimulate children to improve the cognitive development of children aged 5-6 years. This observation is carried out in the experimental and control groups.

Based on data obtained from initial and final observations, researchers will compare the two observations to test hypotheses. The traditional game "*engklek*" is a medium used to stimulate cognitive development of children aged 5-6 years in research in the experimental group. In the experimental group was given treatment (treatment) traditional game "*engklek*" once a week with a total of 8 times the treatment (treatment). Meanwhile, the control group is given other activities that have been programmed in learning.

The result of the traditional game "*engklek*" is seen in the difference in the value of the categories of each indicator in the form of VGD (Very Good Development), DAE (Developing as Expected), STD (Start to Develop), ND (not developed) in the experimental group on cognitive development, until the final activity is rewarding children who have completed the game

independently according to the rules play in the game. Observation activities to determine cognitive development in each child were carried out 2 times, namely the initial and final observations.

The results of the application of the traditional game "*engklek*" can be seen in the table about comparisons on the average group of cognitive development at initial and final observations. The results below show the average comparison of the experimental and control groups as follows:

**Table 6. Comparison of initial observations and final observations in the experimental and control groups of cognitive development in children aged 5-6 years**

Group	Initial Observation	Final Observation	Raising
Eksperiment	11,7	21,67	9,97
Control	11,7	17,63	5,97

In table 6 about the comparison of initial observations and final observations in the experimental group and cognitive development control, it can be concluded that the average value at the time of the initial observation of the experimental group was 11.7 and the average final observation was 21.67 so that the average increase at the beginning of the end of observation is 9.97.

The average value of the control group at the time of initial observation was 11.7 and the average of the final observation was 17.63 so that the average increase at the initial observation to the end was 17.63.

Based on comparative data from the acquisition of initial and final observations in the experimental and control groups of cognitive development that have been described, the increase in the average group at the initial and final observations can be concluded that the results of observations in the experimental group are greater than the control group, which is  $9.97 > 5.97$ . This is due to the experimental group being treated in the form of a traditional "*engklek*" game designed to stimulate cognitive development.

The instrument validity test is a measure that shows the level of validity or validity of an instrument. A valid instrument will have high validity and vice versa an invalid instrument means it has low validity. The hypotheses used for validity testing are as follows:

- 1)  $H_0$ : Questions cannot measure the same aspect
- 2)  $H_1$ : Questions can measure the same aspects

The tested variable is said to be valid if the correlation between the forming variables has a value greater than the value of  $r_{Table}$ , namely  $r_{(60.5\%)} = 0.254$ . The results of testing the validity of each variable for the attribute code can be seen in the questionnaire below:

**Table 7. Validity Test Results**

Variable	Attribute (Code)	Correlation	Decision	Information
Pretest of cognitive for children aged 5-6 years	A	0,679594	Reject Ho	Valid
	B	0,599333	Reject Ho	Valid
	C	0,658245	Reject Ho	Valid
	D	0,602739	Reject Ho	Valid
	E	0,661256	Reject Ho	Valid
	F	0,6383	Reject Ho	Valid
Posttest of cognitive for children aged 5-6 years	A	0,724027	Reject Ho	Valid
	B	0,713872	Reject Ho	Valid
	C	0,759296	Reject Ho	Valid
	D	0,848241	Reject Ho	Valid
	E	0,774375	Reject Ho	Valid
	F	0,77335	Reject Ho	Valid

After testing the validity, reliability testing is then performed to determine whether the measuring instrument used is reliable or not. The following table is the result of the reliability test;

**Table 8. Reliability Test Results**

Variable	Reliability Value	Information
Pretest of cognitive for children aged 5-6 years	0,709576	Reliable
Posttest of cognitive for children aged 5-6 years	0,855689	Strongly Reliable



Based on table 8 about the reliability test, the measuring instrument meets the reliable criteria. The instrument is said to be reliable if the reliability coefficient obtained is at least 0.6 or 0.6 and above. In this table it is explained that the cognitive pretest variable of children aged 5-6 years has a reliable value of 0.709576 then it is said to be reliable, for the posttest cognitive results of children aged 5-6 years has a value of 0.855689 then it is very reliable. Instrument reliability testing uses Cronbach's Alpha. The basis for decision making is:

- 1) If the value of  $\text{Alpha} > r_{\text{table}}$ , then declared reliable.
- 2) If the value of  $\text{Alpha} < r_{\text{table}}$  is declared unreliable

The data in this study will be tested first, in this study the cognitive development of children aged 5-6 years. Subjects in this study were 60 children who were divided into two groups, namely the experimental group, which received treatment in the form of a traditional "*engklek*" game, while the control group ie the group that did not get the treatment, for that reason, before analyzing the data obtained, it should be tested prerequisites data first. Test data prerequisites in this study are as follows:

Data normality test has the aim to determine whether or not the data used in research is normal. In experimental research data on the class being compared must have the same level of data normality. This research uses the Kolmogrov Smirnov formula. Normality testing is carried out with the help of SPSS 22.0 for windows. The results of the calculation of normality test Results of Test for Normality Cognitive development of children aged 5-6 years as follows;

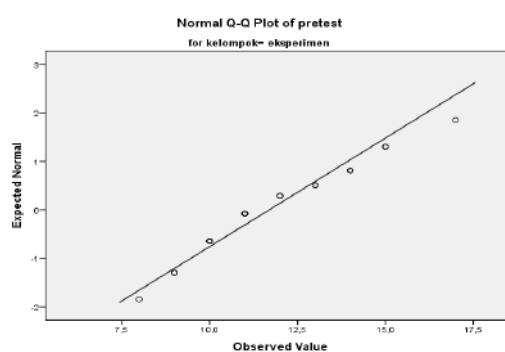


Figure 6. Data Normality Test Cognitive development of children aged 5-6 years Experimental group (pretest)

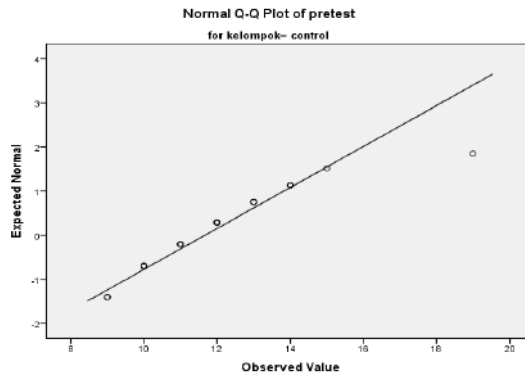


Figure 7. Normality Test for Cognitive Development Data Control Group (pretest)

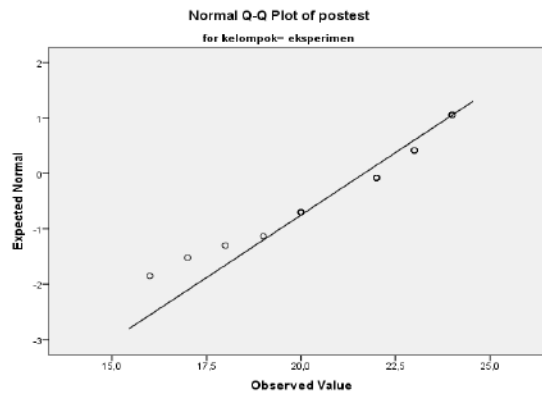
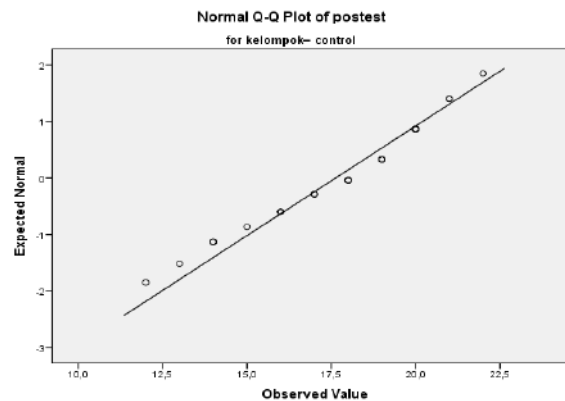


Figure 8. Test Normality of Data Development of Cognitive Groups Experiments (posttest)

**Table 9. Results of cognitive cognitive testing**

		Tests of Normality					
		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
group		Statistic	df	Sig.	Statistic	df	Sig.
pretest	Experiment	,190	30	,007	,939	30	,083
	Control	,172	30	,024	,886	30	,004
posttest	Experiment	,226	30	,000	,879	30	,003
	Control	,169	30	,029	,953	30	,206

a. Lilliefors Significance Correction



**Figure 9. Normality Test Data Development of Cognitive Control Groups (posttest)**

The picture above shows the pretest and posttest testing in both the control and experimental groups. There is a plot of data that moves away and does not follow diagonal lines. From the points away indicates that the data is not normally distributed. Normality test can also be seen in the table below:

From the table, the value of Kolmogorov-Smirnova at the time of the pretest in the cognitive development data of the experimental group was 0.005 and the control was 0.024. While the experimental group's posttest was 0,000 and the control group was 0.029. Thus it can be concluded that the significance value of Kolmogorov Smirnov  $<0.05$  means that the data are not normally distributed.

Homogeneity test is performed to determine the value before treatment in the experimental and control groups and therefore, before testing the hypothesis the data is tested beforehand whether the data is homogeneous in nature.

This test is guided if the Levene Statistic is significantly less than 0.05, it can be said that the differences in variance between sample groups or variance between groups are not the same. Conversely, if the significance value is greater than 0.05, it can be said that there is no difference in the variance between groups is the same. Homogeneity testing in this study used IBM SPSS Statistics 22 using Levene Statistics.

**Table 10. Homogeneity Test Research Data Cognitive development**

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
pretest	,598	1	58	,443
posttest	1,171	1	58	,284

Based on the table on the homogeneity test of cognitive development research data shows that the Levena statistical values for the pretest and treatment results in the experimental and control groups on cognitive development are significant at 0.443 and 0.284 (sig> 0.05). Means it can be said that the variance of the two sample groups is the same or homogeneous.

Based on testing, the assumptions of normality and homogeneity that have been presented previously, it can be seen that the data has fulfilled the assumption of homogeneity but not normally distributed. There are several ways to overcome them by eliminating. Data outliers (discarding high data) or change the method to non-parametric statistical analysis, in this study selected non-parametric statistical analysis methods because after removing the data outliers remain not normally distributed.

The non-parametric method used is the Mann Whitney test because this test is a non-parametric test option if the independent t-test cannot be performed because the assumption of normality is not met. But despite the non-parametric form of the independent t test, the Mann Whitney U Test does not test the difference in mean (average) of two groups like the Independent t-test, but rather to test the difference in median (middle value) of two groups.

The Mann Whitney Test is part of non-parametric statistics which has the aim of assisting researchers in distinguishing group performance results contained in the sample into two groups with two different criteria but some experts still state the Mann Whitney U Test not only tests differences in the median, but rather also test the mean. Because in various cases, the median of the two groups could be the same, but the value of P value is small, that is <0.05 which means there is a difference. The reason is because the mean

of the two groups is significantly different. Then it can be concluded that this test not only tests the difference in median, but also the difference in Mean.

**Table 11. Mann Whitney Test Cognitive Development**

	Test Statistics <sup>a</sup>	
	pretest	Posttest
Mann-Whitney U	447,000	104,000
Wilcoxon W	912,000	569,000
Z	-,045	-5,154
Asymp. Sig. (2-tailed)	,964	,000

a. Grouping Variable: group

Based on Table 11 about the Mann Whitney Test on cognitive development, the Asymp value was obtained. Sig. (2-tailed) of 0.964 At a pretest value that is more than a significant level of 0.05 means that there is no significant difference in the pretest value between the experimental and control groups. Meanwhile, the posttest value obtained Asymp value. Sig. (2-tailed) of 0.00 which is less than 0.05, it can be concluded that there is a significant difference in the post-test scores between the experimental and control groups.

## 5. Discussion

The results of the study about “Stimulating Early Childhood’s Cognitive Development Through Traditional Games” can be described as follows: Based on the results and discussion discussed above, it can be proven that the traditional game "*engklek*" can be used as a stimulation of cognitive development of children aged 5-6 years, where there are two groups namely the experimental and control groups. Both groups have the same or almost the same characteristics. This is proven by the homogeneity test of cognitive development data which shows that the Levena statistical value for the pretest and pre-test results in the experimental and control groups on cognitive development is significant at 0.443 and 0.284 (sig> 0.05). It can be said that the variance of the two sample groups is the same or homogeneous.

The experimental group is a group that is given treatment (treatment) of this traditional game "engklek" as much as 8 times during the research process (March to May) counted once a week. This traditional game of "engklek" is used as a treatment action given by the experimental group to be examined during the research process. The duration of the game in one day is 2 hours for the entire experimental group from the initial activities to the closing activities, while the control group follows the learning activities according to the schedule set by the teacher with other media.

This study uses the traditional game "engklek" designed to stimulate children aged 5-6 years on cognitive development. Activities that can develop cognitive include starting when counting in throwing seed bags, jumping over boxes, jumping on one foot, jumping on two legs, turning the body quickly, bending and coordination between eyes, feet, hands and other limbs.

These activities all require coordination between members of the body with each other, so that all members of the body can be optimally stimulated. This is in accordance with the theory put forward by Decaprio (2013: 18) that body movements that use large muscles or most of the muscles in the body or all members of the body will be able to affect self maturity.

The traditional game "engklek" is a game that has a learning goal. There are six indicators developed, among others, throwing a bag of seeds, jumping over a box, jumping on one foot, jumping on two legs, turning the body quickly, and bending, which is done while saying a number by counting. This game is done individually in each group through meaningful and enjoyable play, so that children do not realize that what is done can develop cognitive aspects that are played outdoors (out-door learning) because playing outdoors can motivate children to be more active, energetic, and physically and psychologically healthy. This is in line with Ward and Montarzino's (2008: 35) theory stating that:

*outdoor play spaces promote healthy child development and are influential in developing lifelong patterns of outdoor behavior (Ward, Thompson, Aspinall, & Montarzino, 2008).*

Outdoor games will encourage children's development to be healthy and influential to achieve optimal development in children and can also develop

children's behavior patterns for life. This traditional "*engklek*" game is one alternative to develop cognitive development of children aged 5-6 years. Children are facilitated with fun games. Opportunity to play to move freely, actively and energetically as the main activity of the child, so that the child's cognitive development is increasingly optimal because the child will explore all members of the body through the movement of either a part of the body or all members of the child's body, all that is done by playing fun, because through play is a vehicle for children to gain experience and develop their full potential for development.

Based on the description that has been explained, the traditional game "*engklek*" can develop cognitive. Certainly in accordance with the indicators developed and the learning objectives achieved. The purpose of learning is the result of a portrait of activities that have been carried out by children in this game, through the traditional game "*engklek*" it is hoped that children will be more active in developing cognitive abilities and provide opportunities for children to be able to play to know a variety of traditional games in a fun way, besides that children can have new experiences that were not familiar with the traditional game "*engklek*" in the school environment. Because playing is fun and meaningful, it can easily optimize all aspects of development in children.

According to Catron and Allen said that play is a vehicle that allows children to develop optimally. Play directly affects all areas and aspects of children's development with play activities that enable children to learn about themselves, others, and their environment.

## **6. Conclusion**

In accordance with the formulation of the problems and objectives in this study, the conclusions that is relevant to research on "Stimulation of Cognitive Development of Early Childhood through Traditional Game" is as follows:

This traditional "*engklek*" game can significantly be used as a stimulation of cognitive development of children aged 5-6 years, this can be evidenced by the differences in cognitive development of children aged 5-6 years which can significantly be seen from the results of research between the

experimental and development control groups children's cognitive for the experimental group is better than the control group from the Asymp value. Sig. (2-tailed) of 0,000 which is less than 0.05, it can be concluded that there is a significant difference in posttest values between the experimental and control groups.

## **7. Suggestion**

Based on the description above from the results of this study, it can be suggested as follows:

- a. For PAUD educators, the results of this study can be used as an alternative to developing children's development through traditional games in Indonesia by combining activities that are more challenging and enjoyable for children to stimulate children's development optimally since age.
- b. This traditional game can be used as an alternative for further researchers who want to research with the same variables and the same game can conduct research in different places, in terms of curriculum, facilities and infrastructure, and research locations.
- c. The results of this study can be compared with other studies that have significant similarities and differences. It is hoped that more researchers will adopt traditional games in Indonesia to complement future studies.

## **8. Acknowledgment**

Please allow the authors to thank;

1. Rector of Surabaya State University, Prof. Dr. Nurhasan, M.Kes and staff
2. Dean of FIP Surabaya State University, Dr. Nursalim, M.Si and staff
3. Head of the Department of Teacher Education in Early Childhood Education at FIP Surabaya State University along with all staff and lecturers
4. All lecturer friends who are members of the acceleration program of prospective professors at Surabaya State University and Ms. Riska and Mr. Basith Pahlavi who have assisted in completing this article.
5. Prof. Dr. Jonh Vong, Ph.D (Chair, ICMAC) & Dr. Jeff Fang (RMIT University) Associate Director for Research of ICAM, who has



provided much knowledge and guidance to be able to complete this article.

6. My whole family, especially my children and grandchildren, who have encouraged and motivated me to finish writing this article.

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## Chapter 2

### Experimental Study: Optimizing Eco-Friendly by-Product Of Rambutan (*Nephelium Lappaceum L*) In Ladyfinger Biscuit

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**Abstract** Rambutan seed disposal and under-utilized that scattered in nature can cause bad impact on environment. However, this edible raw material provides beneficial health effects and can be processed into flour in eco-friendly way. The flour can be used as wheat flour substitute in pastry production such as ladyfinger. The objectives of this study were to know the effect of rambutan seed flour (RSF) substitution and margarine reduction on the organoleptic properties of RSF lady finger biscuits. In this study, 3 x 3 factorial design was carried out and the organoleptic test had been done to measure organoleptic properties such as color, odor, texture and taste. Data was analyzed with two-way ANOVA 1925 and Duncan Multiple Range (DMR) Test 1955. The results showed that different amount RSF substitution and margarine reduction affect the organoleptic properties of ladyfinger biscuits on color, texture and taste. This study indicated that RSF has potential to become a healthy alternative ingredient in sustainable eco-friendly product since it is made from high value nutrition by- product.

**Keywords:** Rambutan seed flour, organoleptic properties, margarine, fat reduction

#### 1. Introduction

Rambutan as one of seasonal tropical fruits in Asia that has well recognized and cultivated on a commercial scale, grow significantly in abundance each year, especially in Indonesia. (Arora, 1994; Indonesia General Directorate of Horticulture, 2017). The abundant amount of seed which obtained when the season arrived has not segregated and utilized well in field area. In Indonesia, the production of rambutan fruit has increased significantly from 737.247 tons/year to 882.628 tons/year in 2014 to 2015, the productivity level increased from 7,17



tons/Ha to 8,23 tons/Ha. This high-level production of rambutan crop will result in a residue or by-product such as rind and seed. However, the by-product derived from commercial crops has a negative effect in the environment since its organic material forms landfill leachate. Moreover, it could become a major source of hydro-geological pollution or contamination of water resources and the natural environment (Liu et al (2012); Foo et al (2013)). Several studies confirmed that rambutan seeds are considered a waste since the seed is bitter and ignored for its nutritional values (Raihana (2015); Cheok, et.al. (2018); Chai, et.al. (2018)). Though a research by Solis Fuentes et al (2010) has reported that in some Asian countries rambutan seeds are edible after roasting. The valorisation approach of fruit by-product has been regarded as potential nutraceutical resources, capable of offering significant low-cost, nutritional dietary supplements and industrially marketable soon (Barbar et al (2011); Federici et al (2008)). An eco-friendly production with the incorporation of those fruit byproduct would help alleviate pollution problems as an applicable effort. Efforts are made to optimize rambutan seed utilization, as Issara, et al (2014) stated that rambutan seed is high in certain fats and oils (primarily oleic acid and arachidic acid) and in rambutan fruit, it contains value to the consumable food industry, and can be used in cooking and the manufacture of soap.

Other studies have reported on the usage of RSF from Khairy, et.al., (2017); Ahmad, et.al., (2017); Solis-Fuentes, et.al., (2010) which have examined the process of turning rambutan seed into flour and incorporating it as food ingredients. While a study by Jirawat (2015) has shown that the protein content of defatted rambutan flour (10.07%) agreed with that of commercially available all-purpose wheat flour, being normally between 9 and 12%. RSF is a modified flour made from dried rambutan seeds and other several processes which result in a ready-made flour. The previous study from Wahini et al. (2018), modified rambutan seed into flour with soaking and several techniques to reduce its bitter taste and improve its sensory quality. Thus, the further research project can be focused on incorporating RSF into biscuit.

Biscuit and biscuit-like products have been made and eaten by man for many hundreds if not thousands of years and their good eating quality makes them attractive for nutritional improvements (Banureka and Mahendran, 2009). Ladyfinger biscuits known as 'kue lidah kucing' in Indonesia. Smith (2004) stated that ladyfingers are dry, airy cakes, often with a sugar crust which are made by piping a stiffly whipped egg-and-flour batter into diminutive oblongs. As Mariani (1999) also describes ladyfinger as light sponge-cake biscuit, the name comes from the usual shape of the confection, which is long and narrow, light and delicate. Ladyfingers are also called 'boudoir biscuits' in England, 'langue de chat' in Italy and in

France they are also called ‘biscuits a la cuilliere’ (Davidson, 1999). The sponge batter used for lady fingers was developed in Europe by the seventeenth century to produce naples or savoy biscuits. Introduced to colonial America under those names, the cakes were often baked in speciallydesigned tins or paper cases of varying sizes and shapes (Smith, 2004). As it is known that one of ingredient to make lady fingers is wheat flour (Allais et al, 2006), this study aimed at substitute wheat flour with RSF which reported as potentially high nutrient ingredients in food application. Considerable effort in substituting wheat flour with fruit seed into biscuits was conducted by Ahmed and Hussein (2014). They aimed at developing gluten-free product as diet biscuit for diagnosed coeliac disease (CD) patient, since gluten in wheat flour is prohibited for them. CD is a form of chronic enteropathy affecting the small intestine in genetically predisposed individuals and is precipitated by the ingestion of gluten containing foods (Gayathri and Rashmi, 2016).

However, the gluten-free bakery products available on the market present poor organoleptic quality, not comparable to wheat ones. Further experiment is necessary to produce the better final product. Thus, this study substitute wheat flour in several amounts until the whole wheat flour composition. Regarding the organoleptic quality of ladyfinger, Biguzzi et al (2014) stated that lady finger has a brownish color, crisp in texture, brittle and sweet taste. Reducing fat ingredients on ladyfinger may affect its organoleptic properties as it is said by Drownowski and Almiron (2010) that fat contributes to the texture, mouthfeel, flavour and odor of food. Fat reduction effect as reported by Ahmed and Hussein (2014) as the higher amount of tiger nut flour incorporation caused higher spread ratio, wider width and thinner biscuit. Moreover, Capmbell et al (1994) stated that substitution of fat had a greater impact on textural attributes of cookies than substitution of sugar or flour. In this study, the substitution of wheat flour in lady finger carried outwith raw material derived from rambutan seed. Therefore, objectives of this is study were to substitute wheat flour with various amount of RSF to the ladyfinger biscuits dough and to reduce fat amount in three reduction levels. The modified ladyfinger then examined its organoleptic properties namely color, texture, odor and taste.

## **2. Materials And Methods**

### **2.1. Materials**

Rambutan used is Binjae type and purchased from a local rambutan field in Blitar, East Java, Indonesia. The main raw materials in this study were RSF which is incorporated with wheat flour by several amounts’ substitution (30%, 40%, 50%). The fat used in this study was margarine and the reduction of fat carried out in three

various amounts, as follow 10%, 20% and 30%. Another ingredient used for lady finger biscuit obtained from local bakery and pastry market in Surabaya, they were included milk powder, icing sugar, vanilla extract and egg white. While the preparation tools for ladyfinger manufacture include pipping bag, hand mixer, baking sheet and oven.

## **2.2. Methods**

### **2.2.1. Preparation of rambutan seed flour**

Rambutan fruits were peeled to discharge its seed and rind. Seeds that have been obtained, wash and then dried under the sun, in order to avoid the growth of fungi that can cause decay in the seeds. Preparation took  $\pm$  2 weeks. Good rambutan seed weight is 6-7 g, from 1 kg of rambutan 100-135 gram rambutan seed could be collected. Soak the seeds in  $\text{Ca}(\text{OH})_2$  and candlenut for 12 hours, then washed with water followed by rinse with distilled water and then dried in an oven at 50°C for 8 hours. The production of flour, the dried seed then sieved using a 60 mm mesh. The flour obtained was packed in a glass container and stored in a refrigerator, maintained at room temperature prior to use. The process of making RSF is described in figure 1 below.



Figure 1. Rambutan seed flour with bitter taste reduction

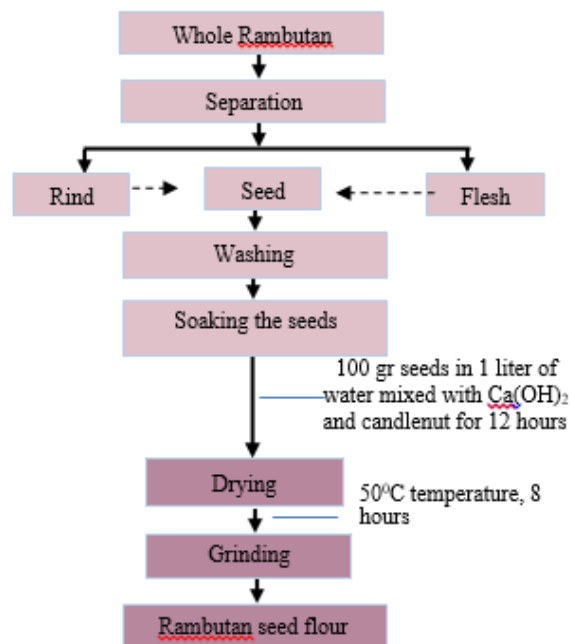


Figure 2. Rambutan seed flour production

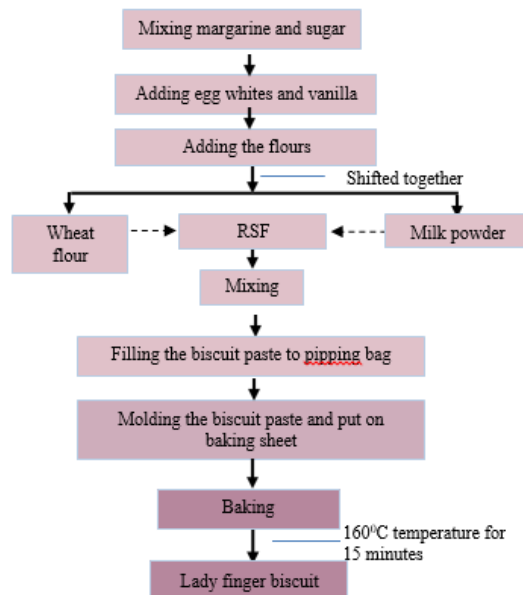


Figure 3. The preparation of lady finger biscuit

### 2.2.2. Preparation of ladyfinger biscuit

Ladyfinger biscuit prepared with nine various treatments which the formulations were described in Table 1 below. All of ingredients must measure well to be used in the mixture. The first step is combined the icing sugar and margarine in a bowl by using a hand mixer, stir for 4 minutes. Add the egg white and vanilla mix thoroughly. Add all kind of dry ingredients, which was RSF, wheat flour and milk powder which have been shifted.

Then, take a sheet of piping bag, fill it with the biscuit paste, close the top, by folding over the piping bag, and cut off the end of the funnel, making an opening  $\frac{3}{4}$  inch diameter. Force some of the paste out of the funnel, on a sheet of paper, in the shape of a finger 3 inches long, 1 inch wide. Leave an inch space between each biscuit, put them on a baking-sheet, and bake in a moderate oven with a temperature of 160°C for 15 minutes.

Table 1. Formulation for RSF lady finger's treatments

Ingredients	R <sub>0</sub> M <sub>0</sub>	R <sub>1</sub> M <sub>1</sub>	R <sub>2</sub> M <sub>1</sub>	R <sub>3</sub> M <sub>1</sub>	R <sub>1</sub> M <sub>2</sub>	R <sub>2</sub> M <sub>2</sub>	R <sub>3</sub> M <sub>2</sub>	R <sub>1</sub> M <sub>3</sub>	R <sub>2</sub> M <sub>3</sub>	R <sub>3</sub> M <sub>3</sub>
Soft flour (g)	300	210	180	150	210	180	150	210	180	150
RSF (g)	0	90	120	150	90	120	150	90	120	150
Milk powder (g)	25	25	25	25	25	25	25	25	25	25
Icing sugar (g)	175	175	175	175	175	175	175	175	175	175
Margarine (g)	300	270	270	270	240	240	240	210	210	210
Vanili (g)	1	1	1	1	1	1	1	1	1	1
Egg white (g)	120	120	120	120	120	120	120	120	120	120

### 2.2.3. Organoleptic Properties Evaluation

Organoleptic properties evaluations of the biscuits were carried out on thirty-member panelist consisted of staff and students of the Department of Culinary, Universitas Negeri Surabaya, Indonesia. The panels were included 10 trained and 20 semi-trained. Biscuits samples prepared from each flour blends were presented in coded white microwavable plastic container.

The order of presentation of samples to the panelists was randomized. Sachet water was provided to rinse the mouth between evaluations. The panelists were instructed to evaluate the coded samples for color, odor, texture, and taste. Each organoleptic attribute was rated on a 4-point Likert scale (for color, odor, texture and taste).



Figure 4. RSF substituted and fat reduced ladyfinger biscuit

### 2.3. Analytical method

Experiment design of ladyfinger biscuit with RSF substitution and fat reduction in order to analyze its effect on organoleptic properties of biscotti brownies was showed in Table 2 below.

Table 2. Experiment design of ladyfinger biscuit with RSF substitution and fat reduction

<b>Margarine reduction percentage</b>			
<b>RSF Percentage</b>	M1 (10%)	M2 (20%)	M3 (30%)
R1 (60%)	R1M1	R1M2	R1M3
R2 (80%)	R2M1	R2M2	R2M3
R3 (100%)	R3M1	R3M2	R3M3

Abbreviations:

R : RSF substitution

M : Fat reduction

R<sub>1</sub>M<sub>1</sub> : 60% RSF substitution and 10% fat reduction

R<sub>2</sub>M<sub>1</sub> : 80% RSF substitution and 10% fat reduction

R<sub>3</sub>M<sub>1</sub> : 100% RSF substitution and 10% fat reduction

R<sub>1</sub>M<sub>2</sub> : 60% RSF substitution and 20% fat reduction

R<sub>2</sub>M<sub>2</sub> : 80% RSF substitution and 20% fat reduction

R<sub>3</sub>M<sub>2</sub> : 100% RSF substitution and 20% fat reduction

R<sub>1</sub>M<sub>3</sub> : 60% RSF substitution and 30% fat reduction

R<sub>2</sub>M<sub>3</sub> : 80% RSF substitution and 30% fat reduction

R<sub>3</sub>M<sub>3</sub> : 100% RSF substitution and 30% fat reduction

The effect of wheat flour substitution with RSF in ladyfinger with fat reduction is analysed with Two-way Analysis of Variance (ANOVA) test (sig. < 0,05) mean differences between unrelated treatments (Fisher, 1925) and Duncan Multiple Range (DMR) is used to separate means where significant differences exist and to decide which formula considered the best one of the RSF lady finger final product. (Duncan, 1955).

### 3. Results And Discussion

The main experiment was carried out in nine different levels of RSF substitution. The sample was tested on 30 panels for each substitution level, therefore the sample size in this experiment is 270. Adair, et al (2001) stated that organoleptic parameters was included color, taste, texture and overall acceptance. This study implemented the suggested organoleptic quality in its assessment that are color, aroma, texture, and taste for each given sample in 9 treatments from RSF substitution and fat reduction. The significant level of the effect was calculated by using the two-way ANOVA test. The results showed that there was an effect of RSF substitution and fat reduction on color, texture and taste of lady finger biscuit, but not in odor. Each of the organoleptic properties had the following significance levels of color 0.00, odor 0.20, texture 0.02, and taste 0.00 respectively as it is presented in Table 3 below.

Followed by Duncan Test, showed that there is no significant difference between ladyfingers in odor, however it appears that substitution of RSF in R3 (100%) amount is associated with significantly higher organoleptic properties score than the other two treatments for color, texture and taste but not for odor.

Table 3. Two-way ANOVA test result of RSF substitution and fat reduction on ladyfinger's organoleptic properties

Properties	Independent variable	Sig
Color	RSF substitution	0.00
	Fat reduction	0.62
	RSF substitution*Fat reduction	0.00
Odor	RSF substitution	0.42
	Fat reduction	0.00
	RSF substitution*Fat reduction	0.20
Texture	RSF substitution	0.00
	Fat reduction	0.01
	RSF substitution*Fat reduction	0.02
Taste	RSF substitution	0.00
	Fat reduction	0.01
	RSF substitution*Fat reduction	0.00

Table 4. Duncan test result of ladyfinger biscuit with RSF substitution

Organoleptic properties	Substitution	Sub set	
		1	2
Color	R3	3.48	
	R2	3.30	
	R1		2.76
Odor	R2	2.72	
	R3	2.66	
	R1	2.60	
Texture	R3	3.72	
	R2		3.10
	R1		3.26
Taste	R3	3.56	
	R2		2.85
	R1		2.73

### 3.1. Color

Color attribute is a major criterion that affects the quality of the food products. The highest average value of RSF lady finger biscuits for color quality was 3.48, is lay on R3M1 biscuit with brownish yellow color criteria. The color of lady finger was influenced by ingredients used such as margarine, and flour. In this study, the color quality of the lady finger was affected by the RSF substitution and fat reduction based on the two-way ANOVA test with the value of sig.<0.05 or 0.00. The test result showed that the more RSF substituted in the dough, the darker color of the lady finger it gets; it was thick brown. The color of the surface of the biscuits was generated due to nonenzymatic browning (Maillard) during baking between reducing sugars and amino acids but also due to starch dextrination and sugar caramelization (Gomez, et al., 2008; Zucco, el al., 2011). Though the fat reduction did not affect the ladyfinger color, the RSF substitution affect the color as well.

### 3.2. Texture

The highest average value of lady finger is obtained from R3M1 sample with the average score 3.72 (criteria for crunchy texture). In this study, the texture quality of the lady finger was affected by the substitution of RSF and fat reduction based on the two-way ANOVA test with the value of p>0.05 or 0.00. Lady finger in Indonesia is known as kind of snack in the form of cookies so it must have a crunchy texture like other typical snacks. The substitution of RSF and fat reduction affect the texture of lady finger cookie final product. Fat is an important factor which helps in improving the texture as well as rheology and overall quality of the



product. A similar effect has been reported by Thongram et al's (2016) study which showed that there was a significant difference ( $p < 0.05$ ) between the flour blends cookies and wheat flour cookies. Two was ANOVA showed that though the RSF substitution did not affect the ladyfinger texture, the fat reduction affects the texture as well.

### **3.3. Odor**

Odor was one of the parameters in determining the quality of a food product. A distinctive aroma can be felt by the sense of smell depending on the ingredients used the dough and other ingredients added in the mixture. The highest score average value of ladyfinger biscuit with 60% substitution and 20% fat reduction (R3M2) was 3.69 (the criteria for the distinctive odor of lady finger and odorless of rambutan seeds). In this study, the odor quality of the lady finger biscuits was not affected by the substitution of RSF and fat reduction based on the two-way ANOVA test with the value of  $p > 0.05$  or 0.20. The substitution of RSF and the use of fat did affect the odor of lady finger cookie. Odor can be defined as something that can be observed with the sense of smell. To be able to produce odors, substances must undergo an evaporation process which was not easily soluble in water.

### **3.4. Taste**

The average value of the highest taste quality of lady finger biscuits with 60% substitution and 20% fat reduction (R3M2) was 3.24 (the criteria are quite tasty to that of typical lady finger cookie and slightly flavored Rambutan seeds). In this study, the taste quality of a lady finger biscuits was affected by the substitution of Rambutan seed flour and fat use based on the two-way ANOVA test with  $p < 0.05$  or 0.00. Lady finger is a snack in the form of biscuits, so it must have a crunchy texture like other typical snacks. The substitution of RSF and fat use did not affect the texture of lady finger final product. The results of this study were in line with the research conducted by Santoso (2015) who concluded that there was no difference in texture between lady fingers cookie using wheat flour and lady finger cookie using a mixture of wheat flour and jackfruit seed flour. Therefore, the substitution of wheat flour in common snack of lady finger cookie can be used by using Rambutan seed flour.

## **4. Conclusions and recommendations**

### **4.1. Conclusion**

The findings in this study is concluded that the best formula can be examined through organoleptic test. The test was based on the use of RSF in making lady finger biscuits of R3M2 sample. Lady finger biscuits with substitution of RSF as much as 40% and the use of butter and margarine fat have the highest value for color, odor, texture and taste compared to other lady finger formulas with different measurement.

#### **4.2. Recommendation**

This study indicates that rambutan seed can be widely developed into raw material such as RSF in food production to both as commercialize product and as alternative household consumption. This paper can be contributed in opening opportunities for MSMEs to develop their business in utilization of by-waste food product such as rambutan seeds, which potentially feasible to be qualified raw material as alternative wheat flour replacement. This paper could be a reference for other researcher or businesspeople to produce other types of RSF-based food product. This paper should be a pilot study carried out in order to give insights on rambutan seed potential to government. In urge their support on rambutan seed processing MSMEs establishment. Thus, the opportunity to produce RSF is obtained at a cheap price and can be developed into the market. If this synergize is sustainable, the level of the economy will grow rapidly whether for MSMEs, surrounding communities or regional government. As of promoting the rambutan commodity as a healthy by-product raw material for flour to be applied to pastry and bakery products

#### **5. Acknowledgment**

The authors wish to express their gratitude to the Rector Prof. Dr. Nurhasan, M.Kes, The first Vice of Rector of UNESA, Prof. Dr. Bambang Yuliyanto, M.Pd, who have supported this research in giving an opportunity to join professor acceleration and its funding; the Dean of Engineering Faculty UNESA Dr. Maspiyah, M.Kes, who has choose the author as representative from Engineering Faculty and giving an opportunity to join professor acceleration ; Prof. Dr. John Vong, Dr. Jeff Fang, Dr. Duong as the instructor in this workshop either for quantitative or qualitative research; Prof. A. Gunasekaran and Prof. Purmendu as chief editor from USA; Mrs. Esti from Widyamandala University; and also Resta and Basith Pahlevi who has helped in communication and administration of this workshop. The author would like to thank the Directorate of Research and Community Service (DRPM), Minister of Research, Technology and Higher Education of the Republic of Indonesia as a provider of the research funding. The field expert team writers,

Romli S. Kom, Mauren Gitta M.Pd., Rini, Didin, and Vian as student assistants. The authors also thank for who provided the opportunity to present one of the six output products tested for the second year in the national research institute MP3EI / PSN Institution.

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## Chapter 3

### **Implementation Of Deming's 14 Points Into The Student-Centered Learning Process: A Study Case In Three Public Universities In Indonesia**

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**Abstract** - Since the success of several companies both in America and in Japan in implementing 14 points of Total Quality Management from Deming in developing their industry, many scientists are then interested in applying this approach in the field of education. This study aims to formulate 14 Total Quality Management's Deming points into the learning process and see its effectiveness. This research was conducted over two semesters, using a parallel-convergent mixed approach which qualitative and quantitative data were used to make interpretations of the effectiveness of the learning process. Qualitative data were obtained through in-depth interviews of 121 in service teachers training in history courses about their learning experience. Meanwhile, quantitative data were obtained from a questionnaire consisting of 36 items with a range of scores 1-3. The quantitative data analysis show that the learning process is effective, which means that students' responses to Deming learning are positive. Qualitative data analysis shows that students can build their own arguments based on the data obtained and they can present their findings both verbally and nonverbal properly and can receive input and update their arguments (transformed) after class presentations. This result is emphasized on the emergence of various variations accompanied by the emergence of new ideas in their explanation, of a social phenomenon, with a historical approach. The results of the study are useful for school policy makers and teachers to improve the quality of learning.

**Keywords:** Total Quality Management; Learning process; Deming's 14 points.

#### **1. Introduction**

Total Quality Management (TQM) is a management philosophy developed by Deming based on his experience working in Japanese industrial companies

during World War II (Lachlan, 1999; Ishikawa, 1985). The emergence of TQM is generally also related to the studies of its predecessors who first studied quality improvement studies, such as Juran (1988), George Box, and Crosby (1979) in the United States and Taguchi and Ishikawa (1985) in Japan. The success of TQM in controlling company quality is increasingly attracting scientists to research more seriously the possibility of adoption in the area of education, particularly management of school quality improvement (Crawford & Shutler, 1999; Bostingl, 2001).

Although some researchers were initially skeptical of the future development TQM (Hackman & Wageman, 1995), over the past few decades, TQM has undergone a transformation as a social movement in the United States and has become a major area of interest. The influence of TQM has expanded from the origin of the industrial sector tested to the Manufacturing sector (Raymond et al. 1998, Hellsten & Klefsjo, 2000; Gustafsson & Nilsson, 2003; Pourjavard, Shahin, 2018; Zhang, Wang, Pei, Yan, 2019), occupational health and safety management, banks, automotive (Ahidar, Sarsri, Selfiani, 2018) organizational leadership (Mårtensson, 2018), and educational institutions (Chizmar, 1994; Elahi & Ilyas, 2019).

According Blankstein, Deming's 14 principles are powerful, universal axioms based on the assumptions that individuals want to do their best and that is management's job to enable them, to do so by constantly improving the system in which they work. The thought contribution of Demings is to establish quality in management can reduce costs, increase customer satisfaction, increase loyalty and profitability (Seth, Deshmukh, Vrat, 2005). There are 14 points Deming above is the essence of management theory about the call for emphasis on Quality Culture. The obstacles to creating quality culture by Deming are due to five things: (1) The goals are less constant; (2) short-term mindset; (3) evaluation of individual achievements through the process of assessment or annual work review; (4) job rotation; and (5). Assessment errors in measuring success, through performance indicators even though the actual measure of success is joy and customer satisfaction (Deming, 1982).

Quality is the most important element in schools because it is one of the determining factors in the effectiveness of learning systems. It is necessary to have a clear understanding so that the problem of quality in schools is not only limited to being a slogan, with a high moral voice but only has a little practical value. Meanwhile, the quality as defined by Crosby (1979) "conformance to requirements", and Juran defines quality as being fit for use. The fit of product users referred to by Juran is based on five main characteristics, namely (1)

technology (2) psychological, namely feeling (3) punctuality (4) Guarantee (5) ethics (Juran, 1993). In addition to Juran, Deming also put forward the idea of quality control into a management theory that helps individuals through knowledge gained from experience into clearer concepts.

The implementation of the principles of TQM to the world of education was first discussed by Crosby (1980 & 1984). Crosby emphasized the quality of the teaching system takes precedence over student test results. He criticized the old system of teaching and offered a TQM strategy that focused on a "zero defect" strategy, a concept that emphasizes efforts to minimize the number of defects and errors that occur in a process, and do everything right from the start. The main objective is to reduce the defect rate to zero. Failures in the "zero defect" perspective are based on the fact that system errors are caused by two things: lack of knowledge and lack of attention (Corby, 1984).

Many educational researchers have tried to analyze ways to improve school quality (Elahi & Ilyas, 2019). Most of them modified the actual TQM Deming model for the industrial world, into the world of education. One of Deming's most well-known philosophies as a basis for modifying TQM in Industry to Education is his suggestion to remove reviews of performance scores in companies and students grades in schools based on tests / test outcome measures (Deming 1993). Deming found that if quality excellence can be achieved in organizations only by effective leadership pattern methods.

Education quality issues are very different from the manufacturing, agriculture, construction and service sectors, occupational health and safety, marketing, and customer satisfaction, in many aspects. Likewise, the issue of school quality as an organization differs from other industrial problems. The concept of School quality and grade completion by students are shown to be directly linked, leading to very different perspectives on educational policy in developing countries. Unique panel data on primary school age children in Egypt permit estimation of behavioral models of school leaving. Students perceive differences in school quality, measured as expected achievement improvements in a given school, and act on it. Specifically, holding constant the student's own ability and achievement, a student is much less likely to remain in school if attending a low-quality school rather than a high-quality school (Lavy, 2002; Hanushek, 2006, Brasington, et al. 2006; Mathur, 2016).

This study examines on the Deming's quality management approach into the learning process, specifically combining total quality management with a constructivist approach to improve the quality of learning. Deming states the



management structure can be completed by improving the quality of education (Deming 1982). Given this goal, the quality of student learning processes is oriented towards identifying and solving problems themselves. Students have the ability to forming the meaning and knowledge, have the opportunity to cultivate critical thinking, and create motivation and independence in solving problems. The constructivism approach emphasizes understanding and knowledge shaped by students themselves by reflecting on experiences gained during the learning process (Bruner, 2009; Bereiter, 1994, Driscoll, 2000;).

## **2. Literature Review**

### ***2.1. Recent study in the usage of TQM management and education***

Card and Krueger (1992) argue that test scores are an imperfect measure of school performance. Indeed, although earnings and test scores are correlated, they are by no means identical. Linking quality with school management, in turn, refers to various problems that arise in schools, such as administrative aspects, teaching professionalism, learning, curriculum, student development projects and the school environment. The quality of schools is considered a failure in their mission, if students are not taught with the values and social skills needed to be a good community in society. Conversely, quality is considered successful if students are taught more with the academic skills needed to be more productive (Glasser, 1990). School quality is not only related to school regulation policies, educational market places, quality of learning outcomes, social responsibility, human resource management, or financial management. However, the issue of school quality also has more sensitive tasks related to improving character education and students' understanding of national integration and cohesion in the learning process. The quality of learning also faces a crisis of emptiness of the teacher's role as a moral model for their students (Bowden, 2009, Popkewitz, 2011).

The correlation between the quality of education in schools with the TQM model can be approached through the TQM strategy and learning organization. Such relationships as "groups of workers dealing with work that are interconnected through computer infrastructure." This new organizational model can develop student creativity, knowledge is the basis of all operations and production processes, and management strategies (Camelia, Cristina, Amelia, 2017). Although the effectiveness of school learning can be observed from students' academic achievements, the quality of schools is also influenced by teacher training, student talent, class situation, school culture and school environment

(Taahyadin & Daud 2018). Several other experts identified poor student input, sub-standard service and teaching quality, undisciplined teachers, unmotivated staff and neglect of student potential as causes of failure to improve school quality. The relationship between the quality of learning management and the learning process is determined by the organization's management. Learning organizations can be interpreted as a type of organization that is able to provide space for innovation and find more effective ways to achieve its goals (Mahapatro, 2010, Senge, 1990).

As stated by Manus (1996), the constructivist approach emphasizes the way a teacher thinks in order to improve teaching and learning processes that emphasize student activities in discovering (Chizmar, 1994) through observation, collecting data, analyzing data, taking experiments, and learning more about what student learn. The teacher is seen as a facilitator who mediates ideas, and builds meaning and knowledge and actions on the learning process and student experience (Morimoto, 1973, Kagan, 1990, Hollingsworth, Dybdahl, & Minarik, 1993; Carter, 1993). The management of learning organizations includes the following aspects, namely leadership, commitment, learning process, and service to students:

According to the fourth aspects above, there are four components of the learning organization can be functioned optimally. A tool can activate the learning process in the classroom in order to produce satisfaction in learning. Services not only depend on the teacher's responsibility, but also place students in their own stewardship. In TQM Deming, it is suggested that employee involvement to dispel fear, thus if students are seen as employees, implies that teachers should empower students by involving them to be brave in making decisions in the learning process (Chizmar, 1994).

The application of TQM Deming in learning is more emphasis on aspects of the process. This is like Enid Brown's view in his interview in the magazine "Educational Leadership Quality (November, 1992 edition)". According to him, in-depth knowledge will be generated from the process of asking important questions. The questions must force us to ask about the process of information formation. The thought process makes students have higher quality cognitive competencies in constructing arguments.

Unlike the traditional learning stages which focus on the teacher's role as the subject of learning and place students as learning objects, TQM focuses students as the subject of learning and the teacher is only as a facilitator who designs learning. The position of the teacher in the learning process is more as a motivator and facilitator than as a source of information. Besides students, the application of TQM Deming is also influenced by the quality of professionalism

of teachers. According to Agi and Harrison (2016), teacher preparation is part of a form of learning management process to make teachers more skilled, efficient and effective in the classroom and school, and professional. From this point of view, learning organizations can be interpreted as the type of organization that is always able to provide, innovate and find more effective ways to achieve goals (Mahapatro 2010, Senge, 1990).

The teacher plays a role in designing so students are able to create, obtain, interpret, transfer, retain knowledge, and facilitate students to form new knowledge and insights. This process is very influential on the cognitive aspects of students (Garvin, 1998). Thus the role of the teacher is no longer a messenger of information to students, nor does it determine the assessment (labeling) of cognitive, affective, and psychomotor abilities with examinations that only use two choices of correct or wrong answer categories. Limitations of assessment that only accommodate right and wrong choices cause students' creativity and interests to be undervalued. Conventional learning is stuck in the inability to articulate variations in student intelligence. When students fail to complete the exam, it is considered a failure, on the contrary if they are able to complete the exam are considered successful and received an award from the community.

### **3. Methodology**

The research sample consisted of 121 in service training students, consisting of (47.82% man, 44.55% woman) whose 28 (19.56%) registered students in Surabaya State University (UNESA), 36 (28.26%) registered in Jakarta State University (UNJ), and 67 (52.17%) registered in Malang State University (UM). The general level of teaching skill at the beginning of the training was moderate, with many students having poor secondary education achievement in history. The training was taught over two semesters. Students in service training are dominantly history teachers who teach at senior high school and private high school in several regions in three big cities in Java (Surabaya, Jakarta, Malang), Indonesia.

This research uses a parallel-convergent mixed approach, where quantitative and qualitative data are both used to produce accurate interpretations of the effectiveness of the learning process. It includes validity analysis and instrument reliability testing based on empirical data collected through questionnaires. Validity is returned at which time the instrument reveals a certain place that must be done. The validity used the Confirmatory Factor Analysis (CFA) technique which carried out using the help of the Lisrel 8.7 program.

**Table 1.** Sample Distribution of In-Service Teachers Training by Percentage

No	Institution	Man (%)	Woman (%)	Total
1	UNESA	10 (55.55%)	8 (44.55%)	18 (19.56%)
2	UNJ	11 (42.30%)	15 (57.69%)	26 (28.26%)
3	UM	23 (47.91%)	25 (52.08%)	48 (52.17%)
	Total	44 (47.82% )	48 (52.17% )	92 (100%)

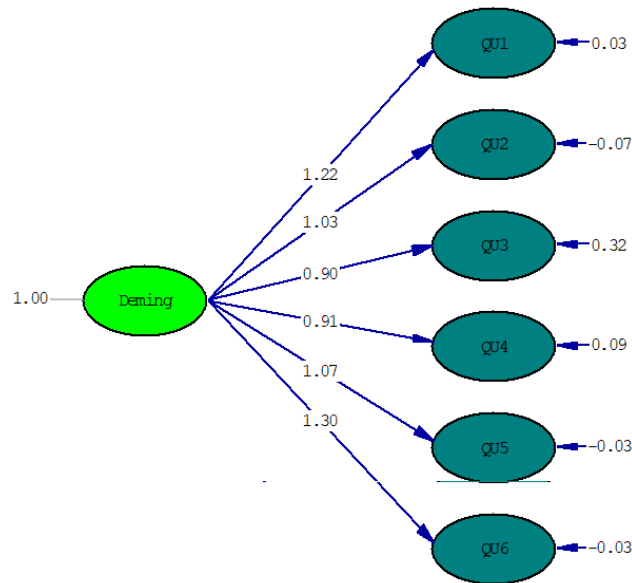
As reported in a separate study, during the first semester, the student groups were randomly allocated to a flipped classroom or to a lecture-based classroom. In this research, students were divided into 5 Focus Group Discussions (FGD). Assessment is carried out through group portfolios and interviews are conducted individually for each student. The Applying Deming's TQM in Learning Process will be explored in more depth below, using Questionnaire consist of Portofolio and 6 questions structured interview as follows on the Table 2 below:

Table 2. Structured Interview's Guidelines

Number	Question's Code
1	How was your opinion about using the Deming approach? <b>(QU1)</b>
2	What do you think about the existence of peer tutors in learning? <b>(QU2)</b>
3	How do you think about the leaders in the FGD? <b>(QU3)</b>
4	whether the method can provide new information to solving your problems for compiling teaching materials? <b>(QU4)</b>
5	Evaluating (self-improvement)? <b>(QU5)</b>
6	How Demings Methods can build new meaning (to work accomplishing the transformation)? <b>(QU6)</b>

From the six main variable above, it derived variables from each core variable. The function of the derived variable is to measure the validity and reliability of the results of the interview based on more specific questions. Derivative variables in this study consisted of 6 questions that were developed from each core variable

(QU1 to QU6). Resulting in 36 questions that are directed at the application of the deming's method in classroom learning. Based on the results of Lisrel 8.7, it can be seen as the Sixth point Deming, each of which has four items with a total of 36 items, has a pretty good validity. This can be seen from the Lisrel output Figure 1.



Chi-Square=1153.72, df=246, P-value=0.08700, RMSEA=0.021

Figure 1. Scheme on Validity of the Sample Data

The p-value was 0.087 ( $> 0.05$ ), the RMSEA value was 0.021 ( $< 0.08$ ), and the overall model match index was above 0.9. This condition shows the population covariance matrix is not different from the sample covariance matrix, so it can be used as a basis for making generalizations. Reliability estimation is carried out using Cronbach's Alpha with the help of the SPSS 17.0 program. A reliable instrument will be emphasized based on general reliability coefficient at least 0.7. Meanwhile, if it is based on statistical tests the reliability coefficient is greater or equal to 0.70, then the instrument is considered reliable. The instrument's reliability with 36 items amounted to 0.93. That is, the questionnaire instrument used to determine the application of the six Deming points during the learning process by the teacher is reliable.

#### 4. Data Analysis

In general, students can compile new hypotheses, criticize problems and identify problems. The process of identifying problems are not only discussed but also proven by looking for sources independently to test their hypotheses. In the process of formulating hypotheses, they dare to revise the old hypothesis after discussing and obtaining information (Interview 4). Thus, conventional learning is automatically abandoned and the learning process is fully controlled by students. The teacher's function only facilitates student activities while evaluating the quality of classroom learning processes (Interview 1). Students are able to apply learning methods that enhance the constructive approach with 14 Deming's points of TQM. This formula has results that they are more courageous and open in expressing their opinions, dare to refute and analyze information, and dare to argue. Although not all can be open with other perspectives from the arguments of other group members, most of them show appreciation for differences of opinion.

Students considering that peer tutors are very important because they can help and exchange opinions (Interview 2). Each student in the group can take turns becoming a discussion leader and become a member. For those who are fortunate to be a group leader, they can exercise self-confidence and instill a sense of supporting other people's opinions (Interview 3). Student is also able to improve the learning process. In studying Deming, the learning process is more important than the statistics of values of 1-100 (Interview 5). In the end, students can explore cognitive abilities to think critically, be innovate, creative, able to well collaborate and communicate. This capability is needed so that collaboration in the learning process is created (Interview 6). According to Figure 1 which describes that the results of student satisfaction can be known with the tools in the form of questions (QU1 through QU6). The students' response clearly to the application of 14 Deming's points in the learning process can be seen as follows.

#### *Deming Approach for Quality Process (QU1)*

The application of TQM in learning can be measured from the quality of teacher professionalism. According to Agi (2016), teacher preparation is part of a form of learning management processes in the teacher system to make teachers skilled, efficient and effective in the classroom and school, and professional. During the first semester, at the beginning of learning, students do not really feel the difference using the Deming method. They still think the deming method is the same as other learning methods, it is not too significant difference. However, after the learning process was carried out in the following months, the students gave different responses. Some students stated that they managed to get out of fear and were challenged to find more information about the problem. Some of the students also stated that they were satisfied with what they had done when they managed to

find answers themselves to the questions given by the teacher. In fact, they try to develop the problems. Another student expresses that Deming's method really helps them to be more active in finding more accurate information, makes learning more interesting and time passes are not felt. They also felt that by using Deming's method, they have new experiences and become more challenged in finding information in the learning process, to identify and solve the learning problems. Meanwhile, another student expect that it is very helpful in reference to foreign media who do not lag behind foreign media.

#### *Function of Peer Tutors in Learning Process? (QU2)*

The teacher encourages students to try to get to know the discussion partners, and recommends that students ask questions which are not clear during the learning process. The response produced is very diverse. Students show enthusiasm in expressing their opinions, openly criticize and be criticized, take the initiative to help answer questions (P5), help solve problems (P6) and communicate with all members of the discussion. The respondents have functioned peer tutor that can share more than self-study and get information faster.

#### *Function of Leaders in the FGD (QU3)*

Some important points that are the focus of the question are related to leadership management in the classroom. Does the leader set the basis for the objectives of the discussion in the FGD? Is your opinion limited by the discussion leader? and does the leader provide the opportunity to discuss material together? Student responses generally state that they are helped by the existence of a clear division of work between the group leader and members. Some students claimed that they were ready to take turns becoming FGD leaders:

"... The group leader functions to coordinate and take responsibility for the course of our group discussions, is responsible for making us more in control of the material" (Ika Selfiati)

"... what do you think about the function of the head of the discussion group yesterday? Self-centered without thinking about solving crucial problems "(Wawan Setiawan)

"... The leader of the group functions as the Leader and reminders of the limits of the material" (Aisha)

"... The leader of the group is already walking something with its function" (Nursan)

"... the chairman is very important because coordination in the formation of learning groups is faster and more organized, especially in the expression of the results of discussions" (Widodo)

However, some students openly criticized the role of the group leader, who according to him did not give members the freedom to discuss. Some students dare to criticize and give an assessment to the leader by assessing whether the leader's function has improved the results of their group discussions or not? Some answered that the leader had organized the discussion process well by dividing tasks and roles to each member before the FGD began,

#### *Provide New Information and Solving Problems (QU4)*

Based on the views of Garvin (1998), learning management is designed so that students are able to create, obtain, interpret, and can grow students' abilities to form new knowledge and insights. This process is very influential on the cognitive aspects of students. Some students have understood the concept of TQM Deming well.

"... The chairman of the group functions to coordinate and take responsibility for the course of our group discussions, responsible for making us more in control of the material" (Ika Selfiati).

"... The group's leader functions as a Lider and reminders of his material boundaries" (Aisha).

"... The head of the group has already done something with its function" (Nursan).

"... the chairman is very important because coordination in the formation of learning groups is faster and more organized, especially in the delivery of opinions from the discussions" (Widodo).

"... It is very important to provide input, especially for new information, in relation to teaching materials becoming a source of new references to supplement teaching materials" (Widodo).

"... The Chairperson of the Group functions as the director of discussions in groups" (Aan Wijaya).

"... Very helpful, students can solve problems with more accurate sources through scientific approaches" (Ika Selfiati).



"... can your method provide new information in solving your problems as a history teacher in teaching or in compiling teaching materials? Very helpful in improving science and technology "(Wawan Setiawan).

"... Because of some files and how to access the sources that you teach on average we already understand them" (Nursan).

"... The meaning is by solving problems in groups and then generalizing in class, then the problem will be solved" (Muhammad Aan Wijaya, S.Pd.).

... "Different, we are more active in seeking information" (Widodo).

#### *Evaluating/ self improvement (QU5)*

According to Deming's 14 principles, students must Improve their quality constituents and must institute a vigorous program of education and self-improvement for everyone (Deming, 1986). Teachers must evaluate themselves by improving the learning process including giving appreciation to students as a form of appreciation following learning in class. Student satisfaction with exam results, and student satisfaction with teacher performance must be measured by giving students direct questions to judge. Some students gave their responses that were greatly helped by the Deming method when searching for answers to questions given by the teacher. This is because the teacher becomes a facilitator who is ready to help find access to sources of answers when students have difficulty completing assignments:

"... I can solve problems with more accurate sources through scientific approaches" (Ika Selfiati).

Very helpful in improving science and technology "(Wawan Setiawan).

"... Because of some files and how to access the sources that you teach on average we already understand them" (Nursan).

Some students claim to be able to obtain new information easily and help in solving problems when given the confidence by the teacher that they can search for information as widely as possible.

"... In contrast, we have become more active in seeking information "(Asiyah).

"...Yes, it becomes lighter in directing students to achieve learning goals" (Afdol Fadli Mahfud).

"(Of course with the many resources that teachers have, students are required to be more active, the teacher's task becomes lighter to direct students to achieve learning objectives" (Sarina Marshanda).

### *Building New Meaning/ Philosophy (QU6)*

According Deming's 14 principles, student must adopt the new philosophy and brave to put everybody in the organization to work to accomplish the transformation. So teacher have to explain to student that they have to know the meaning and concept of education is the process of living. Teacher have to transfer the meaning of education is spirit and lifeharmony. The teacher must also teach students that to know the aims and scope of education is not only looking for good grades from exam results, but succeeding in finding the truth for the development of good moral character. Based on the responses of several students, they realized that in order to solve a problem one had to use a source that was truly accurate and could be justified that sources are very important to share to the students. Some students even claimed to be in love with subjects (history) taught by the teacher in class at the time:

"... Deming's method learning makes History a subject one of students' favorite subjects" (Nursan).

"... The meaning that can be obtained, teaching history can open society to the development of the world that has happened, is happening and even that will happen both around us and abroad globally so that people who study it can face life more wisely" (Widodo).

".....Learning and teaching process is now more oriented at students who are no longer active teachers who are always active. I am glad the teacher's task is not merely a boring lecture but to direct and guide students to the right and right path "(Sarina Marshanda).

## **5. Results and Analysis**

According to the Figure 2, the result shows that most of the deming's learning is oriented towards student learning processes. This can be seen from the learning method that most (73 teachers) provide homework for students to solve their own problems. 30 teachers answered sometimes giving homework, and 18

teachers negating homework for students. Then, most of the homework results are given remedial opportunities, only 13 of 121 teachers do not provide remedial opportunities for students. While 80 teachers provide remedial opportunities. 42 teachers explained the final results of the semester exams to students and another 24 stated sometimes giving explanations. However, there are still many teachers who do not openly explain students' grades. This can be seen from the 55 teachers who stated that they did not submit an explanation of the final results of student grades on the grounds that the final grades were adjusted with several considerations such as student attitudes and not only fixated on test results. Each final result is also conveyed to students openly as seen from the graph that 121 teachers stated that they valued students in the learning process in class and 75 teachers stated that they still adjusted the final results to students taking into account activeness throughout the process.

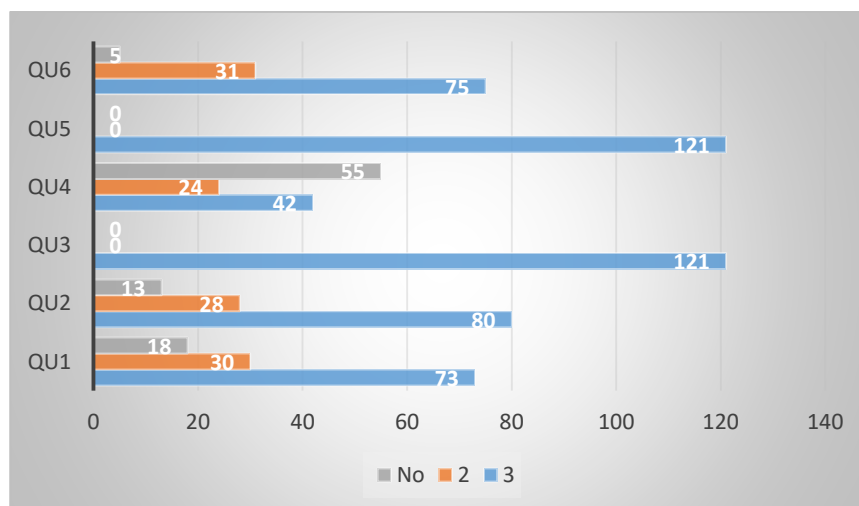


Figure 2. Deming's approach addressed to the Questioned Code

Most of the students (59 students) have tried to get to know the discussion partners during the discussion activities and 35 students stated that they sometimes do the introduction and sometimes not, because they already know all the classmates well. Peer tutors have been functioning well this is evident from the majority of students (64 people) answered that peer tutors offer to friends if there are things that have not been understood by other friends. 38 students also answered they sometimes asked peer tutors instead of asking the teacher directly, while a few students (19 people) said they chose to directly ask the teacher. Figure

3 above can be seen that learning with peer tutors can increase confidence in expressing opinions (96 students). However, there are still many students who are reluctant to give criticism to their peers (67 students). 88 students definitely answered they took the initiative to help answer questions and solve problems together and most (100 students) answered with enthusiasm and always communicating well with fellow group members, while 15 others stated that sometimes they communicated with all members and sometimes not because of the focus on problem solving issued by the teacher.

Meanwhile, the function of the leader (**QU3**) in setting the basis of the objectives of the discussion has been conducted well according to the graph below which shows all students become the group leader which give direction to the objectives to be achieved before the discussion process runs. It was conducted to the 121 students. All students also felt that their opinions were highly valued in the discussion group by the discussion leader (121 students). While 105 students stated that the leader also gave each member the opportunity to take turns to express their opinions, and a small portion of the rest (16 students) stated that sometimes they were still hesitant to express their own opinions and preferred to listen. Based on the graph below it can also be seen that as many as 99 students are ready to take turns becoming leaders in discussion groups (FGD). And the remaining 22 answered are still doubtful. 73 students answered the leader never gave instructions for improvement on the answers compiled. This is because the leader assumes that he has given a clear division of tasks before the discussion takes place and each student has understood their respective assignments. A total of 121 students compactly responded with certainty that the discussion leader always shared the assignment clearly.

A total of 92 respondents have answered that they understand the TQM 14 points Deming method, and only the remaining 29 are still hesitant because they consider the deming method to be almost in common with the inquiry method. Furthermore, based on the graph it can be seen that as many as 83 respondents answered that the teacher had provided improvements during the learning process, both in terms of teaching facilities and learning methods. 68 respondents answered that they had tried to make a target planning to be achieved in one semester of learning and the remaining 42 were still in doubt. They stated that it was better for the planning to be improved and carried out compared to just making slogans of learning targets but not consistently implementing them. 69 students stated that the teacher had also tried well to control the quality of learning by periodically checking students who had not successfully completed the task and had difficulty answering questions. The teacher does not ignore students who are still unable to

fully understand learning, but rather repeats the explanation and guides students to more actively find out by themselves by providing discussion opportunities. 97 students answer with certainty that the teacher provides counseling guidance services well outside of class hours.

For evaluating self improvement, there are 94 respondents stated that they understood the teacher's function only as a facilitator, and not an information center. Conversely, they also understand the function of students trying to improve the quality of learning in order to achieve maximum improvement in learning outcomes. A total of 104 respondents stated that they have given awards to students as a form of appreciation in class, for example when students can answer questions, or want to cooperate cooperatively so that the discussion process runs effectively. All respondents (121 people) answered with certainty that they had approached and known students so students did not feel strange in the learning community. They also become confident and feel valued for their opinion. A total of 57 students felt satisfied with the exam results and teacher performance while 89 students stated students were satisfied with the teacher's performance after using the TQM deming learning method because it was considered very encouraging students to be active and confident in solving problems. They become creative and eager to try to solve new things. 60 students answered with certainty that they were satisfied with the infrastructure and facilities provided by the school such as the provision of LCD facilities for presentations that were available in all classrooms. In addition, there are also Wifi area facilities in several corners of the learning park at school to do assignments.

Question on how Deming's methods can build new meaning (to work accomplishing the transformation) is accordance to 83 respondents answered with certainty that they already know the meaning and concept of education is the process of living. And 57 respondents have also understood the definition of the narrower and wider meaning of education. 81 respondents with certainty answered that they have also been able to explain the meaning of education is spirit and life harmony, and not just about going to school and getting a degree or just only about how to get knowledge. 79 respondents also know the aims and scope of education is a systematic process through which a child or an adult acquires knowledge, experience, skills and sound attitude. It makes an individual civilized, refined, cultured and educated. Then 76 respondents say that they know that education is the whose end product is salvation and all respondents say that education is the key to develop of good moral character and good behavior for students (121 respondents).

### 5.1. Criteria for the Effectiveness of TQM Deming Implementation

Student responses to the questionnaire was analyzed and used to determine the effectiveness of the application of the six TQM Deming points in the learning process. Effectiveness in the learning process is divided into three categories: Effective, Less Effective, and Ineffective. Politomus questionnaire with 3 answer categories (1, 2, 3). After the questionnaire is given, the student response data is obtained which will be analyzed using the R program.

The approach used in data analysis is the theory of GRM model politomus response theory. The relationship of item parameters and the ability of respondents in GRM for homogeneous cases ( $a_j$  'index degree item j' is the same as each step) can be stated as follows.  $P_{jk}(\theta) = \frac{\exp[D a_j(\theta - b_{jk})]}{1 + \exp[D a_j(\theta - b_{jk})]}$  with  $P_{j0}(\theta) = 1$  and  $P_{j(m+1)}(\theta) = 0$   $a_j$  is the difference index of degree item j;  $\theta$  is the ability of participants;  $b_{jk}$  is difficulty index of category k items j;  $P_{jk}(\theta)$  is the probability of capable participants getting a score category k in item j;  $P_{jk}(\theta)$  is the probability of capable participants getting a score category k or more in item j; and  $D$  is for scale factor

Based on the results of the analysis of student responses using the R program, the samples are then put into three predetermined categories. The three categories have different response patterns. Of the 121 response patterns provided, the results of the R program analysis simplified to 9 response patterns presented in the Table 3.

Table 3. Response Patterns to Learning Effectiveness

Ability	Students	Response Pattern						MLE	$\theta$	Score
		QU1	QU2	QU3	QU4	QU5	QU6			
Low	1	1	1	1	1	2	3	0.0032749	-3.0	41.67
	2	1	1	1	2	2	3	0.0008253	-2.5	45.22
	3	1	1	2	2	2	3	0.0000017	-2.0	50
	4	1	2	2	2	2	3	0.0000065	-1.5	58.33
Medium	5	1	2	2	2	3	3	0.0000001	0.0	83.33
	6	2	2	2	2	3	3	0	1.5	83.33

	7	2	2	2	3	3	3	0	2.0	91.67
High	8	2	2	3	3	3	3	0.000102	2.5	91.67
	9	3	3	3	3	3	3	0.0002616	3.0	100

According to Table 3, it can be seen that the effectiveness of learning is low into the category ( $\theta$ ) between -3.00 to -2, with a range of values of 41.67 to 50. The effectiveness of learning is having ( $\theta$ ) between -1.5 to 1.5, with values ranging from 58.33 to 83.33. While learning with a high effectiveness category has ( $\theta$ ) of 2.00 to 3.00, with a range of values of 91.67 to 100. Below is a plot picture of the relationship between student response patterns and the effectiveness of applying the six TQM Deming points in the learning process.

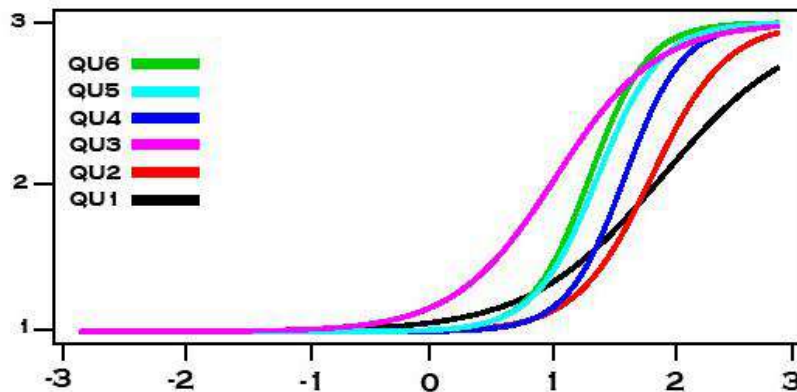


Figure 3. Response Patterns and Effectiveness of Implementation TQM Deming (QU1-QU6)

According to Figure 3, result of R program output illustrates the relationship between the response patterns given by students in the questionnaire and the effectiveness of applying TQM Deming (QU1-QU6) in the learning process. The plot shows that the higher the response given by students to each item from the TQM Deming questionnaire, means the higher the effectiveness of learning. Conversely, the lower the response given by students, it also means the lower effectiveness of the application of the six points of Deming TQM in the learning process. Thus based on the results of the questionnaire analysis at each point TQM Deming and Plot R program output above shows that the application of TQM Deming in the learning process is effective.

## **6. Conclusion**

The implementation of TQM Deming's method could be further improved to propose school quality. It does not only encourage professional teacher services and improves learning outcomes, but also to enhance school management that can be synergizes as an organization. School quality has committed to serving and facilitating student learning activities. We urge education practitioners and policy makers in school to take students perspective into account. In this research, we have discussed students perceptions of their learning experience in applying TQM 14 Points Deming with constructivistic approach. Overall, the students report a more positive in the learning proses experience. The learning process of students can construct their own knowledge and compare with another in the classroom. Students list a variety reasons for solve problems by compiling arguments carried out together with members of discussion groups. students have more alternative views in analyzing an event. They are also able to connect between events now is a continuation of the consequences of policy in the past.

Through the 14 Points Deming approach described above, it succeeded in encouraging students to find the answers to problems themselves with very confident. Students were more than willing to express their experiences with enthusiasm to understanding the topics issues. We can also be found that the students are able to gather resources that support opinions through journals, online media, or based on knowledge and information from experience with others. Students are no longer stuck with passive learning. Students perspective can be developed with wide alternative emphiric reason. Students perspectives can improve learning quality experience.

The results also show that the cognitive of engagement was more clearly such as they become active not only asking questions and formulating problems but daring to defend opinions, and comparing learning outcomes with the thoughts of members of the discussion and confirming their opinions to the teacher. Thus automatically, the dominance of the teacher's role in the conventional learning process can be eliminated.

## **7. Limitations and Further Suggestions**

The limitations of this study deliver from homogeneous samples of the research because it is only occupied to the History course in service teacher training students as the research sample. The students are teachers who come from various schools



in Indonesia. It can lead to less development of new knowledge and experience because the teaching system is similar as learning management system.

Teachers should try to leave the old management system by practicing new management theories in their classrooms. So, it encourages students to create classrooms where students not only do competent work but also start doing quality for works. To make students aware of their responsibilities in quality school assignments, teachers must first build warm and truly non-coercive relationships in teaching useful material (which means emphasizing skills rather than asking students to memorize information). Gradually, the teacher begins to transfer responsibility to students by shifting the teacher's evaluation to the student's self-evaluation during the learning process.

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## Chapter 4

### Heritage And Bakul Gendong (Clover Seller) In Surabaya, East Java

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**Abstract** - This paper discusses the heritage traditional cultural study of small-business clover seller ( Bakul gendong) in the context of urban society. Anthropological assumption about traditional small businesses are an integral institution of the socio-cultural system of the community in which the business is located and takes place. The heritage culture goes on from generation to generation next. Data taken by observation, interview and photos. The results showed (1). The meaning of heritage for clover seller is a struggle and a long journey. Relationships with families must be maintained well, fellow traders, moreover especially customers, because with loyal customers, they will still exist. (2) The construction of community culture in supporting clover seller has very positive implications for the sustainability of this micro business. Clover sellers there are only in Surabaya city, never been found in other cities. This proves that clover seller (Bakul gendong) is a special attraction, especially for traditional culinary enthusiasts. The results of this study are expected to be used as a reference for various efforts to build, foster and maintain the culture of traditional heritage small businesses in Indonesia.

**Keywords:** The heritage, micro business, clover seller, traditional culture.

#### 1. Introduction

Indonesia is the largest archipelago country in the world which has more than 17,000 islands, both large and small islands. Each island has a variety of cultures and traditions which is inherited. One of them is clover seller (Bakul gendong) heritage tradition. Heritage traditions can be a characteristic of the area, for example, Surabaya. As the capital city of the East Java Province, has a distinctive heritage tradition, the name is clover seller. This small business is known for its culture that is carried (gendong in Bahasa), so it is called a clover seller (Bakul gendong).

Clover seller ( Bakul gendong) it is small business local a unique . The uniqueness is that the basket carrying the clover keeps the tradition of peddling clover, namely the tradition of hereditary, how to trade, packaging, its customers, merchandise, the clothes it wears, all of which are very unique and interesting especially in today's modern era. something very step happens in a big city like Surabaya.



Figure 1. Clover seller (Bakul gendong) is selling around

Seeing these characteristics, clover seller (Bakul gendong) it seems far from the “modern” word and not contaminated by current culture. In the midst of the proliferation of global culture that has swept across Surabaya City, the existence of a clover seller is something that is impossible in the current Industrial Revolution 4.0 era. However, this fact proves that traditional culture is also needed to know the history of a society, like research conducted as by (Adhere to Md Ramlia, 2015), conclude ; Classical and traditional food was closely associate with food heritage has become a significant role in the life of society and also to an individual. A study examines how far Malaysian knows about their food heritage identity. A total of 500 respondents located in Klang Valley participate in this study. Findings showed there is a significant relationship between genders with the definition of food heritage; the association of food heritage questions. Overall finding revealed that respondent understand the definition, the criteria's and type of traditional food associated with food heritage (Adhere to Md Ramlia, 2015).

Clover seller (Bakul gendong) still exists today. This is inseparable from the role of Kendung village women who are able to maintain the ancient heritage

of their ancestors. They are the ones who peddle this culinary until now known. Kendung Village is one of the villages in Benowo District, Surabaya City, which is the forerunner to a clover sellers. In this village, the clover sellers cultivate clover plants, process them into clover culinary, and sell them around the Surabaya City. Citing the opinion of (Kittler et. Al, 2008), humans use plants, from how they are selected, obtained, and distributed to those who prepare, serve, and eat them. These processes are unique to humanity. Added that the essential aesthetics of food illustrate authentic cultural identity.

In cultural studies, clover seller use a recipe for ancestral heritage, especially the culinary tradition of East Java (Surabaya) that must be preserved. Clover has high economic value so that it can be developed into individual micro business. Referring to the opinion of (Hisrich, et al, 2008), explain entrepreneurship as the process of creating something new and valuable by utilizing power and time, taking into account social, physical, and financial risk factors and personal satisfaction and independence. Based on this definition, clover seller small businesses enter entrepreneurial criteria at the individual level, with the following views:

1. Able to create new products from the innovation of wild clover.
2. Having a relatively high business adaptation, it is proven that this profession has long been implemented to decline in the next generation.
3. Business risks are managed well by dividing the territories fairly between old and new traders.
4. The physical form of most clover seller is still maintained as the original clover seller profile, although several new generations have begun to use bicycles. The original profile of the clover seller as a form of local wisdom is typical of Javanese culture.
5. Financially they are able to survive, because have their own the market so that their income is also certain.
6. Personal satisfaction in the form of independence of micro businesses that are run for dozens year / decades. Significant small business results with their hard work as a traveling merchant clover (Bakul gendong). They have assets in the village in the form of: residential ownership.

Clover sellers ( Bakul gendong) only found in Surabaya City. This culinary small business has unique characteristics. All micro-business actors clover seller are old women. They came from the same village, Kendung Village, Benowo District, Surabaya City. The merchandise they sell is also the same, a clover culinary. The way to peddle is the same, walking from village to village with

carrying clover. The clothes worn are batik cloth (jarik in Javanese), kebaya and shawl to hold the clover container.

Classically, according to Geertz, the tradition of traditional microbusiness studies in anthropology is placed in the study of markets operating among peasant and markets. Two approaches are used, namely the bazaar economy or also called "penny capitalism" and the institutional approach where the market is considered embedded in the socio-cultural context (Geertz, 1992: 225). The first approach is more towards understanding the market as formulated in neo-classical economic flow thinking. While the second approach is better understood as part of the socio-cultural factors of the local community.

The focus of this research is about: 1. the heritage of a micro-business clover sellers ( Bakul gendong) in Surabaya that still exists and unique as a form of family economic security, 2. Community cultural construction that is developed about clover sellers it as Surabaya's identity.

In addition to exploring the development of this unique traditional clover seller, this paper aims to contribute to the scientific discussion of the identity of Surabaya, especially the Bakul gendong. A highly relevant topic in a variety of disciplinary contexts including history (Schulte Nordholt 1992, 1994); (Creese 2000b), literature (Creese 2000a; Darma Putra 2003b), culture and tourism (Picard 1990, 1996), sociology and anthropologists (Pitana 1997[; ( Howe 1999, 2005); (Allen and Palermo, 2005). Identity, as Stuart Hall (1997) has suggested, is 'a "production", which is never complete, always in process, and always constituted within, not outside, representation'. In other words, 'all identities are in constant mutation. Social and political situations play important roles of Social identity. Clover sellers is one form of cultural representation in which 'identity mutation' can be proven.

Research and papers on culinary clover seller (Bakul gendong) it have not been done much. For this reason, the author also compares with other similar studies, such as the following. The results of the research (Rindawati, 2015), show that Clover Seller and clover carrying are an integral part of the clover village community and there is an element of socio-cultural attachment that has been maintained until now by its successors. The cultural attachment is manifested in the tradition of clover carrying which is genetic or hereditary.

According to Juan Luis Suarez (2015): Culture has long been considered marginal to the core functional areas of companies. Only recently have business leaders paid more attention to cultural differences as firms develop strategies to conduct business globally and adapt to various cultural settings. However, still lack a proper



understanding of how and where culture — that is, information affecting the behaviour of customers and stakeholders — affects business processes and the very positioning in the market.

Many people wrongly believe that culture cannot be commoditized because it is intangible — something spiritual that depends on the creative impulses or efforts of artists. To a certain extent, everyone can identify with this assertion, especially when it has something to do with “our” culture. After all, culture is something that can only be understood by insiders, those who form part of a community in area, an ethnic group where a culture can exist and flourish naturally.

What happens to the clover sellers in fact is a culture of selling the past that is preserved by generations without any change. This phenomenon is very interesting why in this era of sophisticated all-round there are still some people who do social economic activities such as semanggi clover seller (Bakul gendong).

Henderson's research also explained that food heritage needs to be preserved and maintained as the image and identity of the country it represents because some dishes have been blessed with iconic status and deserve to be protected, (Henderson, 2014). Therefore, it is important for every young generation to preserve their food in order to maintain their ethnic identity (Md Nor et al., 2012).

Anthropological perspectives on digital media have opened up analyzes for the study of social relations as they become evident in various online and offline environments that have different social interactions. As a form of face-to-face interaction, anthropologists always support substantial involvement in locality-based reality with local traditions and contexts. Such studies often refer to complex relationships between virtual and real, online and offline, abstract and material, global and local. Boellstorff (2012) defines this as an indexical relationship that is always co-virtual, actual and the core of digital anthropology. Norazmir Md. Nora, et.al, (2012) stated The United Nations through the International Workshop on Traditional Knowledge emphasized that traditional food knowledge should continuously be retained for future generation as they will carry out the profound spiritual and identity for self or as peoples (UNESCO, 2007). Some ethnics are reported not only facing the problem of deskilling issues related to domestic cooking skills but has started to lost the traditional food culture owing to weakening of old generation to pass down the traditional cooking knowledge to the young generations (Bowen & Devine, 2011); (Stringer, 2009):. For instance, young generation are too embrace with pre-prepared, packaged and convenience foods, which lessen their interest in adopting the domestic and traditional cooking from their mothers.

In Malaysia, Malay modern society especially the young generation has gradually ignored the practice of Malay traditional food, which is being replaced with the commercial food products. In addition, social transition and unlimited information technology are believed to influence the changes of food intake and practices. This scenario has received greater concern among the Malay older generation, Malaysian Cultural association and The Ministry of Information, Communication and Culture as well as the other government agencies in order to preserve Malay traditional food knowledge. This is evident when the former Minister of Culture, Arts and Heritage, Dato' Seri Utama Dr. Rais bin Yatim urged the Malaysia citizen to preserve their food heritage delicacies by passing down the knowledge and skill and practices to next generation (KEKKWA, 2008).

Believed the formation of Malay traditional foods occurred earlier and had continuously developed during the trading years received a great influence from neighbouring countries. This can be clearly seen through the influence of Thai in northern and eastern states of peninsular Malaysia while the south region states like Negeri Sembilan, Melaka and Johor having significant influenced from Indonesia such as Minangkabau, Bugis and Javanese. (Ling, 2002) noted that despite the various Malay cuisine through its region from north to south, east to coast and East Malaysia including Sabah and Sarawak but they are identical in terms of the characteristic of the food itself which are strong, spicy and aromatic, This can be proven through the preparation, methods of cooking, availability and uses of the ingredients like ginger, turmeric, chilies, lemon grass and dried shrimp paste and many others (Evaland, 2011). Rozin (2006).

Citing Anderson's observation (2006) in (Dayana Lengauer, 2018) that print capitalism makes it possible for more people to think about themselves so that they relate to others in a very new way. The author develops the argument that in the context of micro business people (Bakul Gendong) has become a trigger for micro businesses in new ways, for example by cycling, using a cart, even online. However, this new social formation is different from that defined by Anderson (2006), as well as with community associations and micro business groups elsewhere in Indonesia. Different from most of these groups, the Clover Seller Surabaya community is here to fulfill the traditional local culinary of the Surabaya people, especially Surabaya clover culinary lovers.

United Nation World Tourism Organization (UNWTO) stated that food heritage has emerged as one of the leading segments in the cultural tourism global business by taking into consideration by the dynamic nature of the global cultural tourism market and the importance of Malaysia having to sustain its competitiveness as a food haven destination in the region, it is pivotal for the government to have a

supportive policy and planned a framework conducive to the sustainability of their food heritage as a cultural tourism product. Food heritage has been used by many nations, societies and communities as a symbolic border in the convergence of taste. Hence, it can be seen as one of an ideal identity, identification and nation buildings tools in a country.

From various research results that have been conducted on food in many countries, Surabaya clover culinary is a traditional culinary that is worthy of research. As academics, the author wants to contribute to preserving and appreciating the traditional local culinary culture, especially clover carrying.

The existence of a traditional clover carrying a relatively surviving and operating in a patterned is the main reason to find out a model of running a traditional heritage business in harmony with local social and cultural conditions. Meanwhile, the city of Surabaya is also known as one of the centers of tourism and industry and culture. The city of Surabaya is also not immune to changes in people's lifestyles due to the inclusion of modern culture. The existence of a number of traditional small business micro traders in the clover seller it seemed to be the answer to how the development of community culture still leaves elements of traditional culture that remain attached to some communities. Empirically, this study will seek to see how the dynamics of traditional clover seller culture amidst the development of modern markets at the local level in the city of Surabaya, Indonesia.

The research method uses qualitative methods with in-depth observations and interviews to illustrate how the clover culinary journey and its micro business from then to now. The study was located in Kendung Village, Sememi, Surabaya City, East Java, Indonesia. The subjects of the research were the clover sellers the heritage small business (Bakul gendong) and their customers.

## **2. Method**

This research approach uses a naturalistic approach, with qualitative methods being the main character of this paper and focusing on ethnographic methods. The strength of this method is the social behavior/action and cognitive expression of the in a daily context, not on the basis of conditions that created by the researcher. Data was collected from a number of sources, both verbally and in writing/documents and relied on relatively informal ways of observation involved and /or conversations. The focus of the paper is on cases that are generally small-scale so that in-depth studies can be carried out. Data analysis uses the interpretation of meaning, function and all consequences arising from a variety of human actions and institutional practices in society (Hammersley and Atkinson,

2007: 3). The substance of this paper is to develop an understanding of the cultural phenomenon of clover sellers as Surabaya's identity. In addition, the nature of the phenomenon under study will not be treated as a form of rigid causality and not to establish a framework of relationships, correlations or influences between variables. For this reason, qualitative research is the main choice of this paper.

### **2.1. Research location.**

The research location was carried out in Kendung Village, Surabaya City, East Java, Indonesia which was chosen purposively. The reason for taking this area as a research location is this place as a center of the clover sellers heritage tradition that is still ongoing and has become a form of traditional culinary culture that has existed since decades ago.

### **2.2. Research subjects**

The subjects of this research were traditional clover sellers of micro-business and parties that related to the existence. Research subjects will be treated primarily as research informants. Research informants will be divided into two categories, namely: actors directly involved with clover carrying and local communities where traditional clover holding originates. The informants are small clover sellers and community members who are considered to have knowledge, experience and perceptions related to the culture of clover carrying. Those studied were traders, community leaders, suppliers of materials, and loyal customers. Informants were selected based on the following criteria: (1) Individuals who are always involved in the traditional business activities of a clover carrying, (2) have a continuous involvement and dependence on a clover sellers in a social and cultural aspect, (3) understanding about the clover sellers problem, and (4) have knowledge of the history and daily activities of the clover sellers.

### **2.3. Data collection techniques**

The main field data collection techniques are participant observation, in-depth interviews and case studies. Participant observation were carried out with the role of researchers to be involved in activities of traditional clover sellers from time to time. Researcher are directly in the daily atmosphere of the clover carrying traders so she can feel and understand the context correctly. In line with this technique, data collection from informants was also carried out using in-depth interviews. This interview uses the interview guide instrument. This in-depth interview was conducted in two forms namely limited interviews and collective interviews. Limited interview is a question and answer form between researcher

and an informant (face-to-face). Meanwhile, a collective interview was conducted between the researcher and several relevant informants. The reason is that the existence of the informant is always related to social and business networks so that confirmation of data is needed from one informant to another. The data acquisition is by taking a case study. Case study according to Bogdan and Biklen (1982) is a detailed test of one setting or one subject or one document storage or one particular event. Stake (1994: 236) states that a case study is a choice of objects to be examined. Some things that will be done in the selection of cases according to the instructions from Stake (1994: 239-240) are (1) identification of the characteristics/uniqueness of the situation of the clover sellers, (2) looking for issues, namely discourse/conditions (circumstances) which become problematic clover sellers, (3) telling of events that represent the culture clover sellers (Bakul gendong).

## **2.4 Data analysis**

Data analysis uses a qualitative approach which is carried out in the stages of the research process. The obtained data analysis are organized by categories: Coding, Index, Physical sorting of data. Efforts to organize the data are included in the analysis step of data management (Huberman and Miles, 1994). In this data management steps: a. Determination of data accessibility and quality (data relevance), b. Document data obtained from the previous step. c. Meaning through data construction that has been commented on. Data is reconstructed based on the framework that has been built on the research plan. Data is then elaborated according to the main concept/focus of the study. The reconstructed data is then interpreted according to theoretical and conceptual understanding of the phenomena studied by triangulation. In general data analysis of this study adheres to an interactive model as recommended by Huberman and Miles (1994), namely 1. Data collection, 2. Data reduction, 3. Data display, 4. Conclusion: consists of drawing and verification.

## **3. Results And Discussions**

### **3.1. The history of Clover Seller (Bakul Gendong)**

The history of clover seller begins with an abundance of raw materials, namely clover plants in Kendung village, Benowo, Surabaya. In the past the population in the area was very small but had large tracts of rice paddy fields. Clover plants are wild plants that are usually present in rice fields. Seeing the abundance of clover plants in the area, the Kendung women tried to cooking it

traditionally, then on sell by going around until now can still be enjoyed with the name of the Surabaya clover culinary, while the seller is called Bakul gendong.

Bakul gendong has been very legendary because it has been around since 1950, which is after 5 years of Indonesian independence. For residents of Surabaya City , Bakul gendong is not a stranger anymore because it comes from Surabaya it self.

The origin of the clover seller micro business ( Bakul gendong)is because one of the original women of Kendung tried to sell clover culinary to other areas in Surabaya. It turned out that this way was followed by other women in Kendung village. Until finally, in Surabaya they have customers who are fond of this culinary. Starting from there, the clover seller ( Bakul gendong) sells every day on foot to meet customers.

Clover sellers ( Bakul gendong) it is a unique local heritage micro business tradition. Clover sellers has been very famous in Surabaya since the independence war. In the past, clover was a favorite food of Surabaya fighters, especially when they drove NICA out of the City of Heroes in 1945. Because it was famous, clover was enshrined in the keroncong song titled Semanggi Suroboyo in the 1950 by S. Padimin which was popularized by Tatiek Wiyono. (Surabaya Story.com). The song lyrics are as follows:

*semanggi suroboyo, lontong balap wonokromo  
di makan enak sekali, sayur semanggi krupuk puli  
bung... mari...  
harganya sangat murah, sayur semanggi suroboyo  
didukung serta dijual, masuk kampung, keluar kampung  
bung.. beli...  
sedap benar bumbunya dan enak rasanya  
kangkung turi cukulan dicampurnya  
dan tak lupa tempenya  
mari bung, coba beli, sepincuk hanya setali  
tentu memuaskan hati  
mari beli, sayur semanggi, bung... beli...*

*Suroboyo Clover, Lontong Racing wonokromo  
it's delicious, clover vegetable puli crackers  
bro ... let's ...  
the price is very cheap, suroboyo clover vegetables  
supported and sold, entered the village, left the village  
man .. buy ...  
delicious seasoning and tastes good  
the cunch turi kale mixed  
and don't forget the time  
Come on, bro, try to buy, just like one  
certainly satisfying  
let's buy, clover, bro ... buy ...*

The song is very famous until now. With the keroncong rhythm, the song is often played when the birthday of Surabaya City on May 31. On that day there will also be a Surabaya culinary exhibition with free meals for everyone who wants to enjoy.

Real heritage is the majority focus for most conservation efforts around the world. Intangible inheritance is often less researched and more difficult to preserve due to lack of physical space to be occupied and difficulty in measuring it. Food inheritance is one example of intangible inheritance which began to be studied more widely (Noresah Moh Shariff, at all, 2008). Traditional food is an expression of culture, history and lifestyle. Food is consumed by people for a long time. These are able to play an important role in building local identity, culture and customs, then they transfer cultural heritage from generation to generation. (S.Nitiworakarn, 2015). Another uniqueness is that clover traders sell by walking around to their customers.

The Clover Seller Surabaya continues to wrestle with microbusiness life in Surabaya to form a unique traditional community and are always eagerly awaited by customers those their. The clover seller community is walking around from village to village every day. Until now the generation of clover sellers has entered the 3rd generations of its origins. Although the demands of the times are increasingly advanced, but they still remain in the way of their own tradition, carrying, so it is a rare socio-economic phenomenon.

The Clover Sellers come from the same village, that is Kendung, Surabaya, East Java. Lately clover sellers is rather difficult to find, but they still exist even though the amount is not as much as past, because the average seller of clover carrying the old age. Clover sellers are tough, independent women to continue the

tradition of the family who are also clover sellers in Surabaya. This is what the authors say that the heritage clover seller ( Bakul gondong) it is very different from other micro businesses.

The clover trader sells by walking around to their customers. Clover traders are often called “Clover Seller”. They came from the outskirts of Surabaya, about 20-40 km from the city center, precisely in the village of Kendung, Benowo, Surabaya. They traveled from their home to the gathering point by public transportation. Usually, they go together in the morning, then rent transportation to be escorted to the gathering point location. After getting off the transport, they scattered around all over Surabaya to visit their respective customers.



*Figure 2: The older generation of clover sellers*

Figure 2 is a routine daily activity carried out by clover sellers (Bakul gondong), which is marketing the merchandise semanggi Surabaya.



*Figure 3: The next generation of clover sellers*

Figure 3 illustrates the current development that there is a change in marketing patterns from going around picking up customers to stopping waiting for customers. This is one way to preserve the culture of clover seller.



### 3.2. The Meaning of Clover Seller (Bakul Gendong)

Before presenting the existence data of clover seller, the author start with an introduction the characteristics of the micro-trader business heritage clover carrying in the table below.

Table 1. *Clover Seller* Characteristics

No.	Subjects	Existence of Socio Economic Level			Level of Genetic Culture
		Experience (years)	Education	Income/Month (million)	
1	Mu'ripah	22	no	3,5	in-laws
2	Ruhana	26	no	4	grandma, mom
3	Salamah	15	Elementary	3,5	Mom
4	Ati	25	Elementary	3,5	Mom
5	Muni	26	no	3,2	Family
6	Warsini	15	Elementary	3,7	Mom
7	Patemi	18	Elementary	3	in-laws
8	Munawaroh	17	Elementary	3	in-laws
9	Sumi	12	Elementary	3	sister-in-law

Source : primary data, processed, 2018

Thus, it can be described that the clover carrying traders have the following characteristics: 1. A woman in the middle and older categories with decades of experiences, 2. The level of education is low, 3. The level of income is high, because it is relatively the same or almost the same as the MSE Kota Surabaya, 4. Experience gained from genetic or hereditary culture. Furthermore, to find out the factors of the *bakul gendong* existence can be seen in table 2 below.

Table 2. *Clover Seller* Existence

No.	Subjects	Experience become trader	Factors	Customer in Surabaya
			Availability of raw materials	
1	Mu'ripah	suffer	Easy	Rarely buy, quiet
2	Ruhana	hard in the rainy season	Summer is hard	Regular customers
3	Salamah	hard to find money	Buy at Skipper	Ask for a cracker bonus
4	Ati	Difficult but happy	Buy at Skipper	in offices
5	Muni	Happy if sold	Buy at Skipper	for party events
6	Warsini	Tired old	Plant self	Old people
7	Patemi	suffer	Buy at Skipper	Quiet (not like before)
8	Munawaroh	Don't have skills	Buy at Skipper	Old and new
9	Sumi	No education	Buy at Skipper	Quiet

Source : primary data, processed, 2018

Table 2 shows that the existence of a clover seller is supported by several factors, including: 1. Very long experience; 2. Low education and low skills; 3. genetic culture / traditions; 4. It is easy to get raw materials, and 5. There are loyal customers in Surabaya.

From both tables, it can be concluded that clover seller (Bakul gendong) has characteristics that are not possessed by other traders. These characteristics include: 1. Traditional, 2. Only carried out by women, 3. Originating from the same location, 4. Sell it by carrying and walking around to villages in Surabaya.

Based on the explanation above, it can be illustrated that the mental process experienced by the clover seller is through the process of interpretation the previous clover seller and is the result of the learning process, by understanding the habits of the previous generation. These habits are genetic traditions, namely hereditary. Other factors that contribute to these individuals becoming a clover seller, including low education, limited knowledge and skills, experience, natural environment factors that support, and loyal customers in Surabaya.

Based on the results of research on the subject of Clover Seller, their goals still exist in order to be able to meet the needs of their life and families, as explained by the clover seller subjects named Mrs. Salamah, (58 years), Mrs. Ati (63 years), Mrs. Muni (63 years) , and Ms. Sumi (52 years). They explained that: "The goal still to be a clover seller is to get prosperity and increase income. We want an increase in income with the aim that our family's economic level is better. Thus, we can meet household needs, not just basic needs, but other needs are also met, for example being able to buy land, buy better household appliances, such as: refrigerators, televisions, fans, etc. "Existence we will have no meaning if only just physically peddling a clover in Surabaya takes a long time and will be in vain if it does not produce something better for our life."

From the results of this study, it was found that the meaning of an the struggle to become a clover seller was a struggle and long journey. Their relationship with family and fellow clover seller must be maintained well, especially with customers. Because with loyal customers, they will still exist.

In the interview with clover seller, their existence when related to the culinary culture typical of Surabaya did not seem so important because for them the most important is the increasing family needs. The most important thing for them is to get money every day, so they can sell more clover and use the profits to meet family needs.

Different things were obtained from the answers to other carrying baskets, Mu'ripah, Rukana and Patemi. "In addition to earning money, our existence as a

clover seller is highly needed by customers of the clover and Surabaya government because of historical and heritage value.

The existence of clover seller is unlikely to last long after the current generation. This was conveyed by the clover seller, among others; Mu'ripah, Rukana, Patemi and Munawaroh. "Nowadays, it is very difficult to pass down the tradition of clover seller (Bakul gendong) to children. They prefer to work in others, for example in factories, shops, supermarkets, offices, and others, which they say are not as miserable as us."

The clover seller represents the Kendung community, Benowo, about how the way and the local nature to survive. This is a reality, but also an economic process that is motivated by the support of family-friendly social and cultural relations for generations.

As a cultural heritage that is certainly full of the value of social capital, the existence of a clover seller is very good if analyzed with several theoretical approaches, especially in the scope of social science studies. As a social reality, clover seller comes with all the elements that are part of their lives. In short, we can draw a common thread that clover sellers (Bakul gendong) are units born with their own cultural identity that are characteristic of the Kendung community. The author tries to align with this basic Korean food culture. We have tried to understand Korean food culture by analyzing Korean traditional music (pansori) (Yang Donghwa Shina, 2015), and painting (DY Kwon, et al, 2015). We understand the strength, compassion, healing, and desire in traditional Korean food. We also understand Korean food as a symbol of Korean culture in terms of aesthetics, namely harmonization, patience, care, and beauty (KR. Chung, et al, 2015). In addition, we discuss Korean food aesthetics in view of philosophical and aesthetic values by exploring traditional Korean food by analyzing Korean food culture in terms of scientific understanding. This will be very helpful for people who want to understand culture and Korean food.

In ancient times as a very long history in Myanmar. Fermented tea leaves were used as a symbol of peace or peace offerings between warring kingdoms. At present, laphet trays are the main expression of hospitality offerings to homeowners (DY.Kwon, et al, 2015).

Matta (2013), cited Bessiere and Tibere in defining food heritage as a set of material and immaterial elements of food cultures, that been considered as shared legacy or a common good. This food heritage includes agricultural products, ingredients, dishes, techniques, recipes and food traditions. It includes table manners, the symbolic dimension of food and in its more material aspects, cooking

artifacts and the table setting: utensils, dishware. In Ramli, et.al (2013), food heritage has been clarified broadly by several researchers on the topics of food heritage which are related to agricultural place and history, origin of the food products (i.e. breed fruits, vegetables and livestock related to regional climate and suitability) and in terms of food production of local produce. In Malaysian perspective, it has been associated closely with classical and traditional foods that are continuously prepared and consumed by all generations without major alteration in the original flavors. Food heritage has been reflected from environmental history, belief, and ideology and food technology of society in an era. While in Wahid, Mohamed, and Sirat (2009), stated from former Commissioner of Heritage,

Tibere and Aloysius (2013), comprises food heritage with rich cultural value and historical insights that belong to the societies, which can be traced from their food trails, for instance, the recipe used and technique of cooking. The rich cultural value creates a sense of 'belongingness' and helps to enhance people's pride that in turn could lead their willingness to preserve cultural heritage. Meanwhile, the historical facts provide knowledge of the past. This could be used as part of efforts to instill public national ethos that unity brings 'togetherness'. It would increase the level of understanding among the people especially those coming from a pluralistic country like Malaysia. The knowledge also helps them to learn and continue to negotiate their cultural differences. This has led to the cultural diversity becoming the country's valuable asset.

The transmission modes of Malay traditional food knowledge within generations. *Procedia - Social and Behavioral Sciences*, 50, 79-88. 3). Food heritage need to be preserved and sustain as its represented country image and identity as some dishes been endowed with iconic status and worthy to celebrate and to safeguard it (Henderson, 2014). Henderson, J. C. (2014). Food and culture: in search of a Singapore cuisine. *British Food Journal*, 116(6), 904-917. Hence, it is important for every ethnic to preserve their food practiced by the young generations in order to retain their ethnic identity (Md Nor et al., 2012) .( Nor, N. Sharif, et al,2012), the transmission modes of Malay traditional.

Likewise with Dham,( Monica Tanwar,et al, 2017): a popular traditional feast prepared during marriages, local festivals, and special occasions of Himachal Pradesh, is a complete food not only according to Ayurveda but also nutritionally. The ethnic foods, include rajmah madra, kadi, khatta, sepu badi, and so forth, exhibit a treasure of food heritage and are an integral component of the diet of the people in the state. The cuisine is developed keeping in mind not only

the geographical and climatic conditions of the state but also according to the traditional methods under natural conditions mostly from the staple ingredients.

If drawn back to the root of the problem that is the focus of this paper, whether we realize it or not, culture is understood as everything that consists of various components. These components are part of an interconnected community cultural system. One of the things that can be obtained from this research is clover seller as a clover culinary micro business performer to maintain family traditions. This is reflected in the family tradition which is carried out to devote the faith that has been held up for generations. Clover seller (Bakul gendong) is an important element of cultural heritage and local wisdom that needs to be preserved. Other than that the merchandise it sells plays an important role in civilize local traditional food, as written by (J.Jordana, 2000). Traditional foods are an important element of cultural heritage and play an important role in local identity and consumer behavior. In addition the traditional foods are very important for rural development and for the sustainability of small and medium sized country.

In simple terms, it can be said that the traditions carried out by clover seller are difficult to release from their daily lives. That is the reason why clover seller is very strong in maintaining their traditions and habits towards clover culinary. The clover seller culture is an added value that can be categorized as social capital for the people of Kendung Village, Sememi, Benowo, Surabaya. Social capital is explicit knowledge arising from a long period that has evolved with the community and its environment in the local system that it has experienced. The long and inherent process of evolution in society can make social capital a potential energy source from the collective knowledge system of society to live together dynamically and peacefully.

The reality of the clover seller existence that carries the economic and socio-cultural aspects, actually emerges the concept of “*nrimo ing pandum*” (accepting what is) and not solely seeking profit (not materialistic), “*sing penting dadi seduluran*” (the important thing is become a brother), namely economic attitudes and actions taken by a person and / or group, prioritizing social-human values for future sustainability. This is a dialect that gives rise to the view that economic factors are not the only way to survive economic activity. In the context of dialectics, the writer can describe the actions taken by clover seller to maintain as follows: The clover seller during its economic activities will behave and make decisions that can not be separated from socio-cultural factors. The strength of both factors arises as part of the hope rationality of a future relationship. This concept if abstracted will be a model of the relationship between concepts, as shown in the following figure.

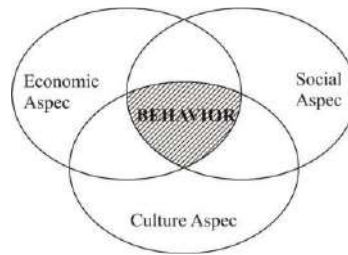


Figure 4. Relationship between Aspects of the behavior of clover seller

Based on the explanation above, it can be illustrated that the mental process experienced by *clover seller* is through the interpretation process of the previous *clover seller* and is the result of the learning process by understanding the habits carried out by previous generations. This habit is a genetic tradition, which is hereditary. Based on this tradition, women in the *clover seller* family must carry on the tradition of the previous generation who also became *clover seller*.

### 3.3. Clover Seller (Bakul gendong) Cultural Construction

Surabaya clover culinary only exists in Surabaya and has never been found in other cities in Indonesia. This has proven that clover culinary is a special, especially for traditional culinary enthusiasts. However, the existence of a clover culinary micro business is now increasingly worrying. The data from direct interviews with clover seller indicate that their customers are mostly old people aged 40-55 years, while young people/millennials are few. If the authors associate with the results of the study (S M D Maukar, 2017): Typical female network services Toulour Minahasa both in the form of catering services and food industry-class households are urgently needed. The development model includes the provision of education and training on the excellent quality of services from entrepreneurs (catering business, household food industry) related to traditional Minahasa food, both staple food, side dishes to delicious, small network of women at the grassroots level . This effort in addition to improving and enhancing the food business of female entrepreneurs also preserving the local culture of the Toullu Minahasa, especially the traditional Toulour Minahasa food with Toulour farmer raw materials is rice, freshwater fish. According to (Jordan, 2000): Choosing to be an entrepreneur by starting a business is not an easy decision, it is also not easy to understand the impact of this decision for the entrepreneur himself and the community as a whole.

The fact, clover seller is a traditional local micro business. Until now the inheritance of the clover micro-culinary business has entered the 3rd generations

of the clover seller family. The development of this clover micro-culinary business is still relatively constant for decades, not undergoing change or innovation. From the clover's own culinary style, how to market it, Sellers fashion style, the age of clover seller remains the same as his ancestors. But in the 4th generation now there have been several clover seller, which initially marketed around from village to village, began to change to stop somewhere, such as city parks, (on holidays) in Surabaya. For example, Bungkul Park. This park is one of the city parks in Surabaya, which once won 1st place in world city parks (2016). It is a very strategic area for micro-business ventures such as clover culinary. In this park a gathering place for Surabaya people who carry out recreational activities, even parents, young people and children, while playing or relaxing can enjoy the special Surabaya clover. Usually this clover seller is in the morning to evening. But if you want to enjoy clover culinary at night, now it has started to enter the Mall, supermarkets and star hotels. That is a good development for clover seller to go up in class. From the lower classes to the upper class can enjoy it. Because of this unique clover, if there is a big event in Surabaya, for example Surabaya's birthday and even a wedding reception held by residents in buildings or hotels, this menu is never miss and ready for invited guests.

The clover seller will represent the community of Kendung, Benowo, Surabaya about how to survive locally. This is reality, but also economic processes that are motivated by the support of family-cultural social relations that have been handed down from generation to generation. As Whitehead calls it 'reality is a process' (Laurer, 2003), reality is not something that is made up, but reality is determined based on events that contain creativity, interdependence and dialectics. The culture of mutual cooperation and working together is still applied by clover seller in everyday life. Solidarity with fellow clover seller, this has become evidence that their existence is an unorganized form, but they have a strong sense of family among themselves to preserve clover culture.

Looking at the development of the clover culinary micro business now there also has been a change of sellers. 9 Clover seller people the authors met and interviewed said that average of them did not want their children to become The Clover Seller like them. It is because the clover seller is miserable and difficult. Every day they have to sell by walking away from their house. But on the other hand clover seller is very happy, if merchandise sells, so that home bring money and next day can be excited to sell again. In addition, they are happy because their clover was bought by young people. The reason is because young people must feel to preserve this culinary culture so that Surabaya clover seller is not extinct.

The results of the study (Angelina Rianti, et.al, 2017), explained that an Indonesian anthropologist interpreted as one of the symbols of social solidarity or reciprocal / give-and-take relationships, known as the law of reciprocity. The reciprocal relationship is related to the habit of giving to each other. The behavior of giving indicates a mutual relationship between one person and another. Such behavior signifies a social relationship because of contact and communication with others that will lead to the attitude of solidarity. This statement, when associated with clover seller is very suitable. Because of all Clover Seller who has interviewed by author said that they help each other and always foster togetherness with fellow Clover Seller and customers.

The researcher enjoyed the steps of Universitas Petra Surabaya in helping the micro existence of traditional culinary business in Surabaya, as follows:: FB in traditional food sector in Surabaya needed improvement in marketing and architectural design branding. Therefore, in collaboration with the Surabaya Cooperative and Middle-Small-Micro Businesses Section of Surabaya Municipality, The Service Learning team created strategic marketing for traditional food hawker, the creative brochure, name cards and social media and architectural redesign in the future food hawker center. Lastly but not least, the social campaign, including traditional and healthy food board games, family business workshops, and exhibitions, was also conducted in collaboration with the Library @ Petra, the Visual Communication Design Department and the General Educational Department of PCU. The impact of introducing traditional food to PCU Students and surrounding elementary school students and also improving the marketability of traditional food especially in Siwalankerto. Related to the research from Petra, the successor of the Clover Seller tradition of clover culinary has done it. By opening outlets or outlamps along Kendung Street, Benowo, they started marketing clover culinary not by carrying and walking around, but staying in place and buyers who came to the seller.

The average seller is 30-40 years old. They are children or grandchildren, the original mantu from Clover Seller. In addition there are also those who are now making new innovations from dried clover vegetables, packed with (instant) spices, so they are called instant clover. Such is the unique journey of the clover micro culinary business from the past until now. 9 Response of the Community to Culinary Clover The results of research on the people of Surabaya about clover culinary responses turned out to be a variety of responses. Of the 9 people who interviewed when buying this unique culinary, on average they said that the clover culinary was delicious and felt addicted if it didn't take long. There are 3 people who are young and they are, in fact, also like this clover culinary. In addition to



saying that the clover is delicious, it is also healthy, because there are no preservatives, and are processed traditionally, such as the seller (Bakul Gendong).

Interview with the author (community), especially those who are old (40-55 years old) say that their preference for clover is because since they were children, they have known this culinary and their family is usually a native of Surabaya. Thus, among them (customers and clover) there is such a closeness. So customers will feel nostalgic if they haven't eaten this clover for a long time. Furthermore, it was said that customer attachment to clover culinary was caused by environmental influences. Among them are family members who often buy clover culinary influences directly or indirectly to individuals to do the same.

In addition to family, the social environment also affects individual interest in traditional clover culinary. The first category is the previous orientation, namely the understanding and experience that customers have related to clover culinary which is a typical culinary city of Surabaya. The next time the category is orientation towards the present, meaning that customers understand the romanticism of the clover culinary that is unique and increasingly rare. The future orientation means that customers hope to contribute to the promotion of Surabaya clover culinary so as not to disappear quickly. The response of young customers (15-23 years) said that clover culinary is a unique and delicious culinary. Of the 9 people who bought clover said that they were interested in this food because it was traditional, the container was from banana leaves (pincuk), the seller was dressed in traditional (Javanese), was old. So they feel there is a rare and strange phenomenon in this millennial era, there are still people who still maintain ancient traditions.

These millennials know about clover culinary, some say from family, but there are also because in the city of Surabaya there are often free traditional culinary meals by the City Government, so they start to know and like it. In line with the Surabaya millennial statement, the United Nations also stated: The United Nations through the International Workshop on Traditional Knowledge emphasized that traditional food knowledge should be continuously retained for future generation as they will carry out the profound spiritual and identity for self or peoples (UNESCO, 2007). Some ethics are reported not only by the problem of issues related to domestic cooking but also from the traditional generation to be down to the traditional cooking knowledge to young generations (Bowen & Devine, 2011; Stringer, 2009). For instances, the young generation is also pre-prepared, packaged and convenience foods, which their interest in adopting is domestic and traditional cooking from their mothers. Likewise with the results of research (Norazmir Md. Nor et al, 2012), explained: Despite that, the issue of preserving

traditional food knowledge has also been brought to the attention of government leaders and academic scholarships on the impact of traditional food knowledge. Traditional Food Knowledge or transmission occurs in Malay.

#### **4. Conclusion**

In simple terms, it can be said that the traditions carried out by clover seller are difficult to release from their daily lives. That is the reason why clover seller is very strong in maintaining their traditions and habits towards their merchandise. The Clover Seller culture is an added value that can be categorized as social capital for the people of Kendung Village, Sememi, Benowo Surabaya. Social capital is explicit knowledge arising from a long period that has evolved with the community and its environment in the local system that it has experienced. The long and inherent process of evolution in society can make social capital a potential energy source from the collective knowledge system of society to live together dynamically and peacefully. The existence of classical and traditional clover sellers which is closely related to cultural heritage has become an important role in the life of society and also an individual. Clover seller is a microeconomic culture of business that still exists and should be preserved. Clover seller culture is a form of family economic resilience in urban Surabaya. Evidenced by the continuity of the culture clover seller (Bakul gendong) heritage. Beside sell by way of working around, for the generation of heirs some who open non-permanent stands/outlets along Kendung Street, Sememi, Surabaya. It is hoped that clover sellers will still exist and become of community identity that not be quickly extinct.

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## Chapter 5

### Managing Dysfunctional Behavior : Case Study Bonek Supporters Football Club Indonesia

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**Abstract** - Football supporters have an inseparable relationship with their favorite club. They always provide full support, but the support given by supporters often breeds excessive fanaticism, which is doing behavior that is not expected by the club because it causes harm. Such behavior is carried out by supporters of Bonek (Bondo Nekat) from the Persebaya club, who have a tendency to commit violence when watching the match. As a club Persebaya must be able to manage the behavior of supporters who can be said does not function as supporters properly. The presence of the coordinator in the midst of thousands of supporters is expected to manage the behavior of supporters and function as a good supporter. For this reason, this study aims to analyze the role of the coordinator in managing the behavior of supporters who are not functioning properly. This qualitative research is approached with a phenomenological approach, which is qualitative rooted in philosophy and psychology. Research location is in Surabaya with informants of supporter coordinator who joined the community. Data collected by interview, observation and documentation, the analysis is done by collecting, reducing, presenting data and drawing conclusions. The results showed the coordinator as an actor while supporters as the target. Supporter coordinators are needed in managing supporter behavior by developing behavioral (behavioral development) supporters that are educative, consistent and sustainable. To socialize Bonek repackage, namely no game no ticket, no racist, no flare and child friendly stadiums with coordination from supporter coordinator supported by Persebaya management. The role of the coordinator can manage the behavior of Bonek supporters so that they can support Persebaya management.

**Keywords:** Managing, dysfunctional, behavior, coordinator, *Bonek* supporters, behavior development, Persebaya

## 1. Introduction

In the world of football, supporters are called the twelfth players of a team that plays in the stands. The football match comes as a solidarity-making cultural event that is able to gather people to support their favorite team against a team that is also supported by its own supporter (Handoko, 2008: 12) [1]. The atmosphere of the stadium will be more alive and not monotonous with the presence of creative attractions in the form of singing and choreography from them. On the other hand, the support given by supporters to their favorite team often gives birth to fanaticism. Fanaticism possessed by supporters will be able to give birth to friction between supporters, which in turn can lead to violence and often ended up riots between them. Apart from encouraging the club to be proud, they can also put pressure on the opposing team.

Giulianotti (2006) states that football is one of the most popular sports of the world population, including Indonesia, because it is easy to find people playing soccer. The ups and downs of football in people's lives are partly because sport is cheap and simple; in the sense that it does not require expensive equipment and requirements. Simple football completeness requirements have become the main attraction for lower social classes in most of the world (in Setyowati, 2017: 11867) [2].

Football is the most popular sport game in the world. By the early 20<sup>th</sup> century, football had spread across the world. Despite some fractious international relationships, football continued to rise in popularity. There is no place that can give much contributions to develop one's feeling or emotion. The memories of a stadium elide into more comprehensive reflections on a multiplicity of emotions. Even in the midst of a cheering crowd, the stadium will always be a place for quiet contemplation for everyone (Aji, Rojil Bayu Nugroho, 2017: 177) [3]

Football is a sport game that is popular and popular throughout the world, not least in Indonesia, but the emergence of forms of violent/aggression is a negative thing from supporters who need to be overcome. This is very dangerous if left unchecked, because their actions which tend to be aggressive can affect the resilience of a region. This can be seen in terms of violations of law and violations of security and public order, which turned out to cause significant losses both physically and psychologically. The loss can be millions or even billions, and psychologically anxious, tense, hateful in the victim/society emerges. And sometimes it causes a reply by throwing a train that came from Surabaya because it was considered part of *Bonek*. There is a negative stigma towards the people of Surabaya as *Bonek*, or part of *Bonek*. (Setyowati, 2013:148) [4]

Aggression has long been part of the sports domain. Indeed, Russell (1993) argues that outside the wartime, sports may be the only setting in which acts of interpersonal aggression are not only tolerated but are also greeted with enthusiasm by a large segment of society. However, in recent years, violent in sports, both on and off the field, is considered a social problem (Tenenbaum, 1997:1) [5]. Team sports events are often associated with the aggressive behavior of the audience. Hence, supporter aggression is a social problem that affects many sports clubs throughout the world. (Toder-Alon, et al, 2018:1) [6]

The acts of violent committed by Persebaya supporters according to Zebua, et al (2014:79) [7] have been widely reported in the mass media for example: in Surabaya, the police did not allow Persebaya supporters to enter the stadium, so that it caused anger and resulted in chaos, Persebaya supporters in a row destroyed the roof of the entrance to the GeloraSepuluh November stadium in Surabaya. The behavior of Persebaya supporters caused damage to the roof of the stadium entrance. Some unauthorized violence is tolerated by players. Cultural normative sanctions frameworks develop, but tolerance limits vary. When teams from countries with very different codes meet, cultural collisions can cause violent outbreaks to disagree both as culture (Finn, 1994: 88-92) [8].

The results of the research conducted by Setyowati (2000) [9] turned out that public perceptions of the aggressive behavior of football supporters in this case *Bonek* supporters, the majority did not like their behavior even they preferred the absence of football. The losses incurred by *Bonek* supporters are extraordinary reaching hundreds of millions of rupiah. Immaterially, there are also the feeling of regional sentiment and deep fear from the victims of *Bonek* supporters.

According to Gumusgul (2016:30) [10] aggression and violence can find a place in sporting events and soccer matches due to social problems of spectators watching matches or matches, which are sometimes included in the category of hooliganism. Scholz (2016:1094) [11] stated that violent behavior becomes main factor for visitors and fans who are disturbed to enjoy the match atmosphere in the stadium.

Violent behavior carried out by *Bonek* supporters is not only inside the stadium, but can occur outside the stadium. Before, during or after the match runs. It can even occur when there is no match for his favorite team. Associated with the opinion of Lickona (1991), the violent behavior carried out by *Bonek* supporters has six out of ten signs that show the destruction of times that can cause a nation's destruction, namely *violence* and *vandalism, disrespect of outhority, peer cruelty,*



*bigotry, bad language, and increasing self-centeredness and declining civic responsibility* (in Setyowati, 2017: 11688).

As if the violent behavior carried out by *Bonek* supporters became a subculture of violence. According to Wolfgang & Ferracuti (1967: 101) [12] what is meant by the subculture of violence is if those who commit violence already have values and norms that have been agreed upon by them and apply to their groups, even though they still recognize the existence of the majority values and norms.

This is interesting to look at if you see the violent behavior that has been done so far. In the midst of the rise of thousands of supporters, the existence of a coordinator is needed, especially for those who join the community. *Bonek* supporters community according to Soekanto (2010: 104-123) [13] is a social group or social group that is a set or unity of people who live together, because of the relationship between them. The relationship, among others, involves reciprocal relationships that influence each other and also an awareness to help. The *Bonek* community is informal because they do not have specific or certain structures and organizations, because they are formed because of repeated meetings and are the basis for meeting common interests and experiences.

The characteristics of social groups according to Sherif (in Gerungan (2004: 92) [14] have the same impulse (motive) on individuals that cause the interaction between them to the same destination, there are due to excessive interaction with individuals who are one and the other, the formation and affirmation of group structures that are clear and consist of roles and hierarchical positions that gradually develop themselves in the attainment of goals and the affirmation and edification the norms of code of conduct between group members governing the interaction of group members' activities in realizing group goals. For this reason, a supporter coordinator is needed in managing the behavior of supporters who do not function as a good supporter.

Based on the background above, the problem is

“What is the role of the supporters' coordinator in managing behaviors that do not work for *Bonek* Persebaya supporters?”

### **1.1. Defining Coordinator as in Managing Role**

A good coordinator is needed in managing a group, especially for informal ones as they choose their own leader. This group develops a communication system to keep its members informed about what management actions will affect them in various ways (Davis, 1978:112-116) [15]. How discussions are led and how plans are being executed is vital for the coordinator. The process of organizing

people or groups must be well-planned, and the members are expected to work together. The harmonious functioning of group parts is a key for effective results (Coordinator, n.d) [16].

John and Davis (2002) [17] acknowledged that the informal group based on social interaction of people, which means that it develops spontaneously as people associate with each other. They emerge naturally, established voluntarily, while support and reasoning depend upon member's interaction, communication, personal likings and dislikings and social contacts within. The bonds between members are very strong and bring in a sense of belonging and togetherness. Supported by Davis (1967) [18], this togetherness can have a powerful influence when people are enabled to solve problems that require collaboration as every member is as important as any other member. Barnard (1970:75) [19] concluded that there is a special relationship between members in sharing their opinions, experiences, problems, and information with each other as a cohesive sense of belonging, of status, and as self respect.

Role is a position that coordinators as the leader of the informal groups has expectations evolving from established norms. The role gives a way of viewing the behaviour of individuals in a group as they respond to and make demands upon individuals in the group. Confusion entered role theory because its theatrical actors analogues metaphor from Goffman (1959) [20] has differed in the ways earliest proponents (Simmel, 1920 [21]; Mead, 1934 [22]; Moreno, 1934 [23]; Linton, 1936) [24] had used the terms. An understanding of role theory then has developed in various definitions that basically brings one key element understanding, which is the relationships among various levels of society.

Turner (2001: 234) [25] stated that the organization of social behavior is at both the individual and the collective levels. Individual behavior in social contexts is organized and acquires meaning in terms of roles, which demands dynamics of interaction, statuses or positions to place roles in a social organizational framework. Banton's *Basic Roles* (1965) [26] and developed structural role theory Linton (1936) and Parsons (1951) [27] are considered rigid that only associated with gender, age, and social class identities. Individuals have adaptive situations to which they apply and in the ways in which they modify the content and control access to other kinds of roles during interaction. Benne & Sheats' *Statuses or Positions* (1948:41) [28] also not explicable yet, because they are linked to positions in occupational such teachers and managers, and family roles, like mother.

*Functional Group Roles* is interesting to be studied further because it defines behavior patterns that emerge spontaneously as individuals acquire situational identities during sustained interaction in a group setting (Benne & Sheats, 1948:42). Roles such as “leader” (Goldman & Casey, 2010:118 [29]; Dagher & Zaydie, 2005:39 [30]; Tavakoli & Lawton, 2005:155 [31] and “follower” (Rost, 2008:58 [32]; Whitlock, 2013:20 [33]; Maroosis, 2008:17) [34] are the key. For final touch, Biddle and Thomas’ role theory (1966) is a good fit on explaining in collective levels.

As in the role in Bonek community applied in collective level, the position of the coordinator in the community is the same as the position of the actor in the theater that the expected behavior does not stand alone, but is always in relation to the presence of other people who are associated with the actor (Biddle, 1986:68) [35]. Biddle and Thomas (in Sarwono, 2008:216-217) [36] provided five terms of behavior in relation to role, such as *expectation*, *norm*, *performance*, *evaluation*, and *sanction*. This has an effect on the energy and emotions in a group of supporters which could foster feelings of self-confidence, excitement, strength, enthusiasm, towards the game. People with a higher level of excitement, can cause a merging of identities to be willing to involve an expanded sense of self-building in collective action. Their attitude in interactions with fellow fans of football during collective action helps in explaining the interrelationship between the role of self-feeling and the incorporation of identity. The next trend is to expand and to act collectively on behalf of groups (Besta & Kossakowski, 2018: 9-10) [37].

The supporter’s self-identification of a football club can be translated into the extent to which he can be involved in a team, both in the performance of the game and the extent to which he is represented in the team's identity. If the supporter has entered deep into the identification, then he is willing to take some unexpected actions or be angry with his team's defeat (Spaij, 2014:152) [38]. Therefore, self-control of a group of masses and group leaders from supporters has an important role to be able to control the mass of supporters because they have the power to move them.

The efforts made by the new management of Persebaya towards *Bonek* supporters certainly mean good and positive, but what must be rethought is not to be counterproductive. *Bonek* supporters have shown that as supporters who have heroic character, high solidarity, are willing to sacrifice and limitless loyalty, then if management asks to do something that is well-intentioned even though it is difficult of course they will try to learn, especially for the good of the supporters themselves. For this reason, more intensive communication is needed with the coordinator. Continuous socialization needed so that *Bonek* can be better.

*Bonek* coordinator according to Nasikhah (2015:x) [39] is a person who coordinates, connects, regulates and conceptualizes. They have rights and obligations and play an important role in coordinating so that supporters can control aggressive behavior. The period continues and there is an encouraging development of behavior shown by significant *Bonek* supporters, especially since 2016. It can be seen from their behavior known as *Bonek Repackage*, with several behavioral things such as *no game no ticket, no racists, no flares*, non-smoking stadiums and child-friendly stadiums. The latest in 2019 they also carried out activities such as “*Budhal moleh resiko*” which was cleaning up the Bung Tomo Stadium after the match they collected rubbish and threw Dolls for children who were treated in hospitals in Surabaya.

For this reason, supporter coordinator role is needed to minimize the violent behavior carried out by the supporters. As stated by Menkopolkam that football is a unifying tool and encouraging, also becomes a part of the birth of a generation that has character and mutual feelings over differences, therefore the supporter coordinator has responsibility toward its mass management. (<http://sport.detik.com>. *Sepakbola Punya Tanggung jawab*. Accessed: July 5, 2019) [40].

## **1.2. Conceptualizing Dysfunctional Behavior in Football Supporter**

Human behavior is a function of the interaction between the person or individual and his environment (Nadler, Hackman, & Lawler, 1979) [41]. Individual brings his abilities, personal beliefs, expectations, needs, and past experiences into the group. A number of studies interested in the psychology and management of sport spectators have turned their attention to fans' level of team identification. Team identification concerns how the fan views the team as an extension of self-identity, that extent to which the fan feels a psychological connection to the team (Trail, Fink & Anderson, 2003 [42]. Affective, cognitive, and behavioral responses that are linked to team identification have the benefits for the individual fan, the team, and the community as a whole. Recent studies have found a positive relationship between level of team identification with a local team and social psychological well-being because the identification provides an important connection to society at large (Wann, Melnick, Russell, & Pease, 2001) [43]. Other studies have also suggested that sport team identification can be beneficial to communities as a whole by encouraging and strengthening community integration (Lever, 1983 [44]; Wilkerson & Dodder, 1987 [45]; Melnick, 1993) [46].

However, the intention to support the team at any sporting venue reveals that

there is a darker side to the team identification. A handful member of the group appears to be abusive. Prior studies (Dunning, Murphy, & Williams, 1986 [47]; Russell, Arms, & Mustonen, 1999 [48]; Stott, Hutchison, & Drury, 2001) [49] have focused on violent behavior of crowds, suggesting that violent outbursts of hooligans, occur for reasons of social identity and identification with the team. Griffin & Lopez (2005) [50] stated that any form of intentional behavior is potentially injurious to the group and/or individuals within the organization. Kish-Gephart et al (2010) [51] acknowledged that the expression of willingness to engage in unethical behavior is also intentional. Voluntary behavior that violates group norms could be threatening the well-being of the group and its members, as studied by Robinson & Bennett (1995) [52]. These identified fans are a conceptual result of dysfunctional fans.

In psychological terms, dysfunctional behavior of fans is abnormal or have impaired functioning as it relates to socialization and social groups in the sports context. Aggressive behavior directed at others in the form of verbal abuse is typical of those who are clinically diagnosed as socially dysfunctional (Sjoestroem, Eder, Malm, & Beskow, 2001) [53]. Social dysfunction often leads to other forms of aggressive behavior and violence (Bech, 1994) [54], as has been evidenced at sporting events. In the sports context, dysfunctional fans are no more highly identified with their team than other loyal fans who are not dysfunctional, yet these persons are highly confrontational and tend to frequently complain about a variety of components of the sporting environment. These persons are often loud and obnoxious at sporting events, freely and intentionally directing their anger toward other fans, players, and officials. In this sense, their participation and identification with the team appear to be engaging in confrontational behaviors at the stadium on game days (Gibson et al., 2002 [55]; Stebbins, 2001) [56]. In conclusion, the role of supporter coordinator is highly needed for maintaining the balance, when some of identified fans is a conceptual result of dysfunctional fans.

## **2. Methods**

### **2.1. Types of Research**

This study uses a qualitative method with a phenomenological approach, which is a tradition of qualitative research rooted in philosophy and psychology, and focuses on the experience of human life. The phenomenological approach to using life experience as a tool to better understand the socio-cultural, political or historical context of that experience takes place. Phenomenology is the idea of thinking about a phenomenon in various dynamics of subject experiences that give

meaning to an event. Not a rigid event, but an event that undergoes a process towards forming the meaning of a subject's experience in a life event. It can include experiences that are complex, continuous, interrelated and particular. What is emphasized by phenomenologists is the subjective aspects and behavior of people (Waters, 1994:31) [57].

Phenomenological approach of Schutz and Luckmann is a strategy for interpreting and explaining human actions and thoughts by describing basic structures. Reality that seems real in the eyes of everyone who clings to the natural attitudes (in Denzin and Lincoln, 2009:37) [58].

## **2.2. Research Location**

This research was conducted in the city of Surabaya which is the home city (*home base*) of Persebaya with *Bonek* supporters as supporters. The location of this study was at the Bung Tomo Stadium in Surabaya.

## **2.3. Research Subject**

The subjects in this study were the supporter coordinator of *Bonek*Persebaya in Surabaya and the surrounding area as the members of community of Bonek Campus, Bonek Unesa, Bonek ITATS, Bonek Untag, Bonek Unitomo, Persebaya History Observer, and Green Nord.

## **2.4. Data Collection Techniques**

In accordance with the data sources in qualitative research that is used, the data collection techniques would be in observation of participation, conducted during a football match where Persebaya competed at the Bung Tomo Stadium in Surabaya. Then we need in-depth interviews, carried out when meeting with research subjects at the stadium or in their homes or where they gather according to community habits. Analysis of documents, including documents from newspaper news, documents from the community, social media and videos obtained from youtube, or television are also needed. (Creswell, 2013:267) [59]

## **2.5. Data Analysis Technique**

In qualitative research the process of analyzing and interpreting data requires a creative, critical, and very careful way of thinking. Both are interrelated and closely related processes. Data analysis is a process for organizing data in order to get patterns or forms of order, while interpretation of data is the process of giving meaning to patterns or regularities found in a study. The data collected is expected to be the answer to the research questions that have been formulated by the

researcher. The analysis is through data collection, data reduction, data presentation and drawing conclusions from Miles and Huberman (in Sugiyono, 2013:38) [60]

### **3. Finding**

#### **3.1. Role of Coordinator in Managing Dysfunctional Behavior of Bonek Supporters**

Football not only teaches the values of how to achieve victory. Football also teaches how to accept defeat. Strictly speaking soccer involves everyone to always be brave in a state of winning and losing. That is the realism of fate that must be learned from football. Bill Murray said that soccer always contains emotions and fanaticism. The nature of football fanaticism is unique because people who are in it are willing to defend their favorite team with sacrifices that are not small, both energy and funds (Giulianotti, 2006) [61]

For this reason, a coordinator role is needed to manage dysfunctional behavior of the supporters. There are no standard criteria for being a coordinator but being a coordinator will usually be given to elders or seniors who can protect, comfort, and be role models. The seniority element cannot be eliminated other than some special things that are owned by several communities. Interview with the supporters' coordinator or those who are considered to be trusted in a community. Football supporters usually have communities that are a meeting place, share stories, and foster solidarity. Through these communities each member internalizes all knowledge socialized by the institutional structure within it. Knowledge that is considered true will judge the community and other communities themselves.

Regarding the role of the supporter coordinator, according to Rojil (Persebaya History Observer)

“... There are no criteria strictly or rigidly who is the coordinator. But understanding each other and just agree on who is leading because all members of the admin are ready to be led. However, it is very important that there is a leader or coordinator, both structurally and culturally. If the supporters consist of many masses there are no leaders, then there is a big potential to be deflected in a negative direction. Therefore, the coordinator has the function of coordinating so that the supporters of positive behavior (especially in the Indonesian football culture) are realized, both when supporting and also outside the stadium for other activities such as social activities and educative ... “(Interview, 29 May 2019).

According to Putra (*Bonek Unesa*) the supporter coordinator role

“... maybe we will hold 2-more activities that educate *Bonek* and the general public in the future, ma'am. The coordinating role is simply to unite each member element in order to stand tall and sit down to the welfare and progress of this forum ...“ (Interview, 22 May 2019)

According to Dhiemaz (*Bonek Untag*)

“... we ourselves are the coordinator's role to be able to maintain and be able to embrace the members themselves, and become a motivator for all members ...” (Interview, May 27, 2019)

Bayu (Green Nord 27) said that Supporters' Choir Roles in managing dysfunctional behavior of Supporters are as follows.

“... using social media to determine the intersection point and then on the border is discussed the pressure. They did not meet in person, just met when they arrived. There is no definite mam schedule, which was discussed earlier, about what choreography was made, where the funding, ticket distribution and so on ... “For the GN it has been completed to discuss the issue of violence, because we have long educated *Bonek* friends who other about it. This includes eliminating the relay culture when away initiated by the GN along with other stands coordinators (Interview, 23 May 2019).

Whereas the coordinator role according to Naldo (*Bonek Unitomo*)

“... the coordinator's role is certainly very vital in maintaining and regulating so that the community continues to walk upright, even though sometimes there are often differences of opinion among members, but all of that is natural in an organization/community, just how the community Chair person resolves it in discussion based on *Podo ijone* or *seduluran nomor siji*, *Alhamdulillah* up to now this community still exists and continues to run with the rules “that have been agreed upon for the conduciveness and sustainability of the Community ...” (Interview, 23 May 2019)



According to Afif (*Bonek* ITATS)

“... the coordinator's role is to coordinate if the members are away to support the government, hearing about the members' complaints ...”

The coordinator role of supporters according to Rojil (PSP)

“... as a role model in the Indonesian football culture will be an example or role model for the community because it can move the masses of massive supporters. The support coordinator is expected to be a good example and has responsibility for the support group community. Not infrequently the emotions and psychology of the supporters' masses when they see the match and are disappointed with the match can make fans angry. So is the rivalry with other supporters who have their own uniqueness. If inside *Bonek* there are several community groups or stands that have large masses. There is East Tribune, Green Nord (North), TribunKidul, Gate 21 and West Tribun VIP. The role and function of the coordinator is an interpersonal liaison in various matters, both choreography, mutual reply between interpersonal chants, and attitude or coordination when doing away days to the opposing club's cage ... “(Interview, 29 May 2019)

The role of a coordinator can be seen before the match, to the stadium, during the match and after the match also when there is no match. One form of good coordination is when *Bonek* struggles to restore Persebaya to become a member of the PSSI, they aspire to and organize themselves without any riots when they go to Jakarta demanding their club's rights and also to Bandung to acknowledge the return of Persebaya in 2017. Supporters' coordinators like Andi Pecie, Capo Ipul, Grandong, Hasan Tiro and friends to keep the situation conducive to each other, but *Bonek*'s aspirations remain conveyed.

When Persebaya was recognized again and participated in competitions in League 2 (Indonesia League) [62], many positive things were done by *Bonek* coordinated by their coordinator. For example, campaigning should not do racist chants that are violent and that can work well. To eliminate racist songs and smell of violence is not an easy thing to do by *Bonek* coordinators, at first there were differences of opinion, but eventually it was agreed upon. Of course, there must be other chants that must be created. The creative chant created has supportive lyrics to Persebaya. *Bonek* and Persebaya have Song for Pride anthem, *Suara Bonek*,

*Persebaya Harus Jadi Juara, Kami Bonek Bonita, Yo Ayo Persebaya, Ayo-Ayo Green Forceku (Ale-Ale o).*

As done by Green Nord 27 they increase creativity and eliminate racist songs slowly. By increasing this creativity, it is expected that all the sides of the 10 November Stadium will also roam Bung Tomo with the support of tens of thousands of Bonek present, which will eventually trigger the spirit of players on the playing field. There were no racist songs during the match that were only songs of support for the pride of the team. (<http://greennord27.com> (online) The story behind the North Side of Gelora 10 November-September 18, 2017).[63].

The coordinator's role is also evident from the observations of *Bonek* supporters who are members of the community, there are things that are done before the match and heading to the stadium, namely convoys heading to the stadium with the uniformity of the community, occupying the same place in the stadium, preparing banners to coordinate stadium entrance tickets, changing places to mix with the other regional coordinators in turns, there are rules for wearing costumes or community attributes, until the preparation of the choreography that will be presented during the competition.

From the video documentation, it illustrates the behavior of *Bonek* supporters who have changed since 2016. There are several things that can be seen such as creative choreography, non-racist singing and behaviors that are not inspired anymore to manage the dysfunctional behavior of supporters. Also, there are some news relating to *Bonek* supporters from the mass media as well as recording songs about *Bonek* supporters who have changed and the coordinating role in them. Changes in *Bonek* supporters' behavior can also be seen as a video blogging (vlog) Ismidiyanto, a policeman who has his own way of increasing *Bonek*'s positive image (Jawa Pos, May 31 2019) [64]. They cleaned up at Bung Tomo Stadium after the match with the coordinator supporter is also appreciative.

Football traditions in Indonesia and even in the world, it has clubs with members of support groups known as twelfth players who come from the city or region from the club. This resulted in strong regional fanaticism in each support group which resulted in fragile friction between supporters if the club met with each other (Marwan, Iis 2018: 14) [65]. The existence of *Bonek* supporters has existed since Persebaya is still in the Union until now. They are shaped in large communities with thousands of members, hundreds and some in small form with a total of five or ten people. The community of *Bonek* supporters who are big and quite old with thousands of members is the Surabaya Supporters Foundation (YSS). There are around 80 *Bonek* supporter communities. Each of them has a

characteristic, can be seen from t-shirts, scarves and hats that are used, with the green as dominant color and has its own rules that apply to its members (Setyowati, 2014:159) [66].

2017 is an important period for Persebaya because it is recognized again as a member of the PSSI and can take part in the Indonesian league competition at the annual PSSI congress in Bandung. Persebaya can compete again even though it must be in League 2, to be finally able to go to the top competition of the Indonesian league. Happiness also increases because since Persebaya is under the auspices of the new management, namely PT *Jawa Pos Sportainment* (JPS) as the holder of 70%. This new management does something that make players happy such as paying off player salaries and other expenses. In addition, holding a *Bonek* Conference is a sharing of supporters with hundreds of communities and management. Some activity plans are also delivered, but there are some that are still a problem when there is a desire for *Bonek* repackage by changing the appearance of *Bonek* supporters, namely child-friendly in the stadium, without smoking in the stadium and without flares in the stadium.

**No game No ticket.** If there is no ticket, you should not come to the stadium. Having a ticket to watch a match must be ensured in every supporter. A few supporters who do not have ticket because they cannot buy it, hoping that when the second round of match starts the gate can be opened and they can enter.

**Child-friendly.** So far, many parents are still reluctant to invite their children to see football matches in stadiums, even though in many big cities, especially overseas, on weekends when they see their favorite teams compete, it is a joy for parents. Along with their young children joined hands happily to the stadium watching their favorite team compete. On the other hand, there are also many children who see Persebaya without the supervision of their parents. They headed to the stadium by taking a vehicle that they could ride without paying.

**No smoking at the stadium.** It can be observed that the majority of supporters do not smoke during the match, they smoke while waiting or during a game break or the end of a match. The prohibition must certainly be delivered properly without any emphasis, because it is rather difficult if you want to change this. If it is done, you may start it when you want to enter the match field.

**No flare.** Flare is a very exciting one in a match, usually set on at the beginning or when there are goals and end of the match. The atmosphere is less comfortable without flares even though the smoke caused is enough to disturb the eyes and breathing of the supporters themselves.

**No racist.** During this time many songs that contain SARA and make emotions from both sides of the supporters and often end in violence. For this reason, the present song should not be racist anymore, becoming a song that contains passion and pride for Persebaya.

Supporters' violent behavior can be minimized by studying the historical process of the feud between the two groups of supporters. It is expected that there will be learning and solutions so that the conflicts that are built become sporty and not anarchic. The assessment of a conflict by looking at it from a Sociological perspective - where society and cultural conditions will be the object being studied is expected to arise a mediation whether it is a negotiation or something else. Thus the position of the supporters as a club supporter will occur reciprocally with the club that is supported. In addition, it is expected that peace between football supporters in Indonesia can occur, so that the coordinator's role is very necessary. Involving the support coordinator is very important to do, need a further meeting specifically to discuss this. Each community has a certain meeting that they routinely do, at that time what can be conveyed is the desire of the new management of Persebaya.

#### **4. Discussion**

Supporters' violent behavior is not easy to eliminate. In addition to the level of violence in society, some scholars argue that social acceptance of violence in the wider community is also related to fan violence. Mann (1989), for example, suggested that 'ulc' is different in norms relating to respect for order, tolerance for emotional expression (including aggression), and recognition of previous rights of others. "... sports stadiums are places where these norms and values are expressed."(Ostrowsky,2016:4) [67].

Those norms and values are harmonized with Cleland (2010:540) [68] and Cleland & Dixon (2015:541) [69] in categorizing Redhead's active/passive supporter (1993) on considering the relationship changes between football club and fan. This shows how the 'active' nature of fans is increasingly producing greater participation through debate in supporter forums in big clubs, while in smaller clubs more 'passive' fans don't give much of their opinions. (Garcia & Welford, 2014: 524) [70]

Concerning Persebaya as a big club, nature of 'active' fan works with Vallerand's *Dualistic Model of Passion* (2003:756) [71] as a result of internalization process. First, obsessive passion refers to uncontrolled desires (Deci & Ryan, 2000:238 [72]; Sheldon, 2002: 68) [73] to be involved in preferred activities, becomes an identity as a football fan. Furthermore, with obsessive

passion, fans may feel compelled to engage in the activity even when they should not. Consequently, they may experience negative emotions once engagement in the passionate activity is terminated (Ratelle et al., 2004) [74]. In addition, this internal urge to engage in the passionate activity should lead the fans to remain cognitively (Bandura, 1989: 9) [75] engaged in the activity, to experience contemplation about the activity, and eventually lower positive affect (Mageau & Vallerand, 2007: 378) [76].

Contrary to first nature, harmonious passion results from an autonomous internalization (Deci & Ryan, 2000; Ryan & Deci, 2000:70) [77]. Autonomous internalization occurs when fans freely accept activities as important to them without the possibility attached to them. Harmful desire refers to a strong tendency to engage in activities voluntarily and with willingness (Vallerand, Fortier, & Guay, 1997:1168) [78]. Thus, with harmonious passion, individuals do not experience this uncontrollable urge to engage in the enjoyable activity (Vallerand, et.al., 2008: 1280) [79].

The gathering of a large number of people whose behaviors may vary is often a concern for a crowd management. Those who are tasked with functions to control the crowd takes place such at a sport event. Behavior in its simplified form may be described as the way one acts or conducts oneself, especially toward others, or how a person acts in response to a particular situation. It is not easy to determine the collective mind of the crowd in order to take a good decision. In all circumstances, the crowd behavior will lead to unpredictable and impulsive actions (Kingshott, 1993:272) [80].

In further relation to crowd, Kingshott (2014:280) [81] has divided active crowd into four, namely: aggressive, escapist, acquisitive, and expressive. The “aggressive” describes those crowds where the objective is either violence or destruction, or a combination of both, to achieve what is perceived to be the common purpose. The “escapist” describes what may have initially been a passive crowd but then a common element of danger or fear, brings about the need to escape from the immediate environment. The “acquisitive” crowd is an opportunistic. In areas of social disorder brought about by others, within either the crowd or acting separate from that crowd, that disorder will allow opportunities for looting. The “expressive” crowd is primarily concerned with the expression of feelings or emotions. The expression of such emotions may be expressed by physical reactions accompanied by verbalization to vent the emotions felt.

These emotional outpourings to sporting events where the team expectations may be expressed by spectators as delight or frustration depending upon their

perspective of the event. It is apparent that there is no one psychological perspective that would explain individual behavior in a crowd environment. People's behavior can be affected by "norms" that will emerge from the crowd environment. The individual will follow the actions and behavior patterns of those crowd members around him and thereby the individual will follow the majority (Brindley, 1982:32) [82].

With the main idea of Biddle and Thomas' role theory, it is certain that the coordinator of Persebaya supporters from several communities have carried out their role well, linking the two passions experienced by the football supporters. There is actor which is supporter coordinator, and there is audience target namely Bonek supporters. There are five terms about behavior in relation to roles; *expectation* that is the hope that the violent behavior carried out by *Bonek* supporters is reduced, *norm* each community has rules that have been agreed upon by each community, *performance* behavior of Bonek supporter becomes better and it suits with *bonek repackag e* and *evaluation* and *sanction* where the community provides an assessment if the behavior of the *Bonek* supporters of each community led by the coordinator has changed considerably compared to before and sanctions from the community and society will be accepted if the supporters act.

The role that has been carried out by the supporter coordinator according to Linton has described social interaction in the terminology of the actors who play according to what is determined by culture. In accordance with this theory, hope of role is a shared understanding that guides supporters to behave in daily life. According to this theory, someone who has a certain role is expected to have someone behave according to that role.

Then, a sociologist named Glen Elder helped expand the use of role theory. The approach called "*life-course*" means that every society has hope for each member to have certain behaviors in accordance with the age categories that apply in that society (Elder, 1998:5) [83]

As stated by Bates (2014: 598) [84] is an important effort to systematically systematize and sharply focus on a broad, but vital and developing perspective known as "role theory". This term is very unfortunate because the implication is that the real body of a general theory really exists, whereas the opposite is true. They can do with a *humanistic-entrepreneurship* approach, that is, by carrying out a humane and kinship approach with effective communication. For this reason, the coordinator's role is to carry out several activities which can be referred to as *Behavior Development*, namely the development of supporters' behavior as has been done by several communities above and the efforts of Persebaya management

and support from the Surabaya City Government. Role as a strategy, to get support from the society (*public supports*) so that in the end it can manage dysfunctional behavior of Bonek supporters.

## 5. Conclusion

In general, there are no clear criteria for becoming the coordinator of Persebaya supporters, but those who are appointed as coordinators have responsibility, loyalty and concern for Persebaya. The supporter coordinator's role is called educative, consistent and continuous *behavior development*. Bonek supporters will not be a subculture of violence if they are not mistaken in interpreting their values, norms and identities. The coordinator role of Bonek supporters from various communities if in every meeting doing something for the glory of Persebaya and Bonek supporters themselves then violent behavior will be minimized. Providing something understanding of values, norms and identities correctly with good motivation and goals, it will be able to bring the good name of Persebaya and Bonek supporters themselves. It is not an easy thing indeed because in football, violence and social identity is a unit that is difficult to avoid. For the long term it is necessary to conduct research related to efforts to manage dysfunctional behavior of Bonek supporters who do not join the community.

## 6. Acknowledgment

Author wish to thank the Faculty of Social Sciences and Law, Universitas Negeri Surabaya for supporting this research.

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## Chapter 6

### Improving The Mobility of Visually-Impaired High School Students In Indonesia – a Pilot Study

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**Abstract** - The technology, information and communication system has become a pioneer in the existence of interactive multimedia mock-up that is used for the orientation and mobility on visually impaired- student. This study aims to examine the effectiveness level of interactive multimedia mock-up based on orientation and mobility in instilling the mastery concept of the school environment for visually-impaired students. The research was conducted in order to measure on how effective the mock-up is to be applied by visually-impaired students and it has been done through the performance test. The mock-up is designed with the audio program, braille writing, tactile sensitivity and guideline book that is considered as an effective interactive multimedia mock-up. Based on the accuracy assessment, the use of mock-up is very helpful in providing the information to the students to attain the intended destination correctly and appropriately without any obstacles in school environment. The result that has been tested on 27 Junior High School Students and 9 Senior High School Students confirmed an excellent accuracy. This mock-up design can only be used in a certain school specifically used in this study. It is hoped that this study can provide an example and overview for other schools if visually impaired students at that school are low in orientation and mobility.

**Keywords:** interactive multimedia mock-up, mastery of environmental concepts, visually-impaired

#### 1. Introduction

Visually impaired students as individuals who have abnormalities in their visual senses are going through issues that interferes their activities on daily basis. Krech, Crutchfield, and Ballachey (in Depsos, 2002: 35), states that visually impaired individuals experinced abnormalities in their physicological structure and rely to other senses to perceive the environment. Lowenfeld in Lydy Reidmiller,

Lauri (2003), states that visual impairment could cause three forms of limitations, namely 1) the limitations of the concept and the diversity of experience, 2) limitations in the interaction with the environment, 3) limitation in orientation and mobility. This means that students with visual impairment often have limited motion on their environment.

Basically, visually impaired students have some obstacles in mastering environmental concepts, so their orientation and mobility will also be disrupted automatically, the tendency that happened to be passive in moving for fear of getting lost or wretched when walking in the surrounding environment. In a place that is too large, such as in a school environment, student with visually impairment sometimes feel confused when walking in locations that are rarely accessed. Eventhough the student concerned has a quite good ability of orientation and mobility.

School becomes important for visually impaired students as the second closest environment besides house and family. For 8 hours in a day or if it is presented approximately 33% of the time students with visual impairment are spent in the school environment, especially the students who live in dormitories. Furthermore, in teaching and learning activities teachers do not only use a single room to study, but sometimes also move classes or rooms during the learning process that is appropriate to their subjects. If visually impaired students do not master the concept of the school environment properly, then the student will always be left behind from their friends or even confused when walking towards the intended place. This is in accordance with curriculum development Orientation and Mobility which is one of the competencies which refer to visually impaired students are able to walk independently indoors and outdoors.

Based on the interview in January 2015 with several visually impaired students regarding to the mastery concepts of school environment, it showed that visually impaired students were still confused when walking in a school environment that they rarely attend. Another weakness on visually impaired students is that they lack of understanding of the condition of all building positions and access roads in the school environment. In introducing the school environment to visually impaired students, teachers can use environment-based learning (*environment learning*). According to Husamah (2013) stated that by utilizing the school environment, students are invited directly to gain an understanding of concepts and important experiences of objects outside themselves.

In orientation and mobility learning, many students are trained to orient an object or thing that can be done in an environment outside the classroom. Besides,

students are also trained to find landmarks / clues and clues or signs that can be used as a direction for passing through. Conducting teaching and learning activities outside the classroom can shaped students be more independent in doing several activities. The school environment that is too broad is one of the complexity problems of visually impaired students, so it is difficult to understand the condition of the school. In the other hand, the information that is obtained by students regarding to the school environment is only verbalistic in the form of words from the teacher or other friends. The information obtained can be misunderstood by the student in concerned.

To overcome these problems, there are two ways for a teacher has to do, 1) provide provision of orientation and mobility skills to visually impaired students that can be used as a guide for various activities in the school environment, 2) develop a learning media that can provide an overview of the school environment to visually impaired students. The Development of multimedia model that is packaged based on learning technology in the design, development, utilization, management and evaluation of processes and sources for learning (Seels, B. Barbara & Rita C. Richey, 1994). Learning technology seeks to design, develop, and utilize various learning resources, so that it can facilitate or make it easy a person to study anywhere, anytime, by anyone, and by means of any learning resources that are appropriate to their conditions and needs.

In connection with interactive multimedia mockups, it is designed with audio programs to provide guidance for visually impaired students to various places in school environment. Furthermore, this interactive multimedia mockup design is equipped with Braille letters for each building, making it easier for visually impaired students to recognize each building to be addressed at special school place. The completeness of audio programs that are heard by visually impaired students has a function as a guide to various available places in the school environment, and will be recorded and remembered in the student's brain to be used as knowledge. This knowledge understanding will be confirmed by visually impaired students through feeling, one of them uses interactive multimedia mockups that are equipped with braille letters.

The potential impact of visually impaired students after understanding the concept of the school environment through interactive multimedia mockups is that they get real performance in their school environment. This interactive multimedia mockup is an alternative to embedding the concept of a school environment that can be designed in a wider (outdoor) environment, so that students with visual impairment can easily understand the conditions of their social environment. According to Ungar, Blades, and Spencer, (1999), showed that to provide the



mastery concept for visually impaired student among others is the use of embossed maps and models in informing learning comprehension, the results would be better with environmental settings (outdoor) that were relatively strange to visually impaired student. Thus, this study aims to examine the level of effectiveness of interactive multimedia models based on orientation and mobility to instill the mastery concept of school environment in SLB visually impaired student.

## **2. Literature Review**

Several studies have been conducted when it deals with visually-impaired student. In the study of Tang (2015) mentioned that technology utilization can be the best thing for visually-impaired people to do their activities. In Tang's study, she focuses on IT-based touch panel cognition and development for the visually-impaired. According to the TAM, when users perceive an IT-based device as useful and easy to use, they are likely to have a positive attitude toward accepting the new technology. Thus, based on the positive results of our experiment, we know that an IT-based touch panel prototype such as the CBS should serve well as a new device for the visually impaired since it is not only capable of effectively sending short text messages but can also motivate the visually impaired to accept new technology.

Siu, Wong and Xiao (2018) focused on the policy, implementation and management of the inclusive design of open space for visually-impaired persons. They admitted that it may not be easy for policy makers as well as designers to implement inclusive design open for visually impaired persons because of many existing barriers and practical limitations. According to Siu (2012) stated that One of the easiest ways to provide continual and sufficient information to visually impaired people is through tactile maps and other Braille documents at the key locations and junctions of a park. Another way to help visually impaired people is to use new assistive technologies appropriately. New technologies are recommended to provide independence to visually impaired people without negatively affecting park life for other users. Smart applications such as personal electronic products, induction loop systems and tactile image printers have been proven effective in guiding visually impaired people and helping them to search, receive, store and display information on park life.

Another technology to help visually-impaired in doing activity is by utilizing screen navigation system. Compass-based screen navigation is discussed to help with computer-aided drawing for BVI individuals. The navigation system is operated by compiler input commands. BVI computer users were tested using different screen navigation tasks to assess the accuracy and efficiency of this

compass-based navigation technique by using a prototype (SETUP09) and tactile paper grid maps (Djan & Fernando, 2018).

To choose an appropriate media for visually impaired students, then first need to pay attention to the characteristics of students. Visually impaired students use more feeling and hearing for observations. The use of technology presented should be able to be optimized for the visually impaired students through palpation/tactile and hearing (Hallahan, etc, 2009). Then the use of the selected technology can be controlled directly by visually impaired students and they may also create interactions to objects or other learners. Heinich, Molenda, Russell and Smaldino (1999: 229), said multimedia refers to various combinations of two or more media formats that are integrated into the form of information or program instructions. The program is a multimedia interactive audio equipped with a controller that can be operated by the user, so the user can choose what is desired for further processing. The most important characteristic of interactive audio program are students not only pay attention to media or objects, but also expected to interact socially during the process.

### 3. Research Method

#### 3.1. Approaches and Types of The Study

This study using research and development (R & D) approach model of Gall, Gall and Borg (2003). In it is application is done through cycle steps, as follows; *a) Main field testing, 2) Operational product revision, 3) Operational field testing, and 4) Final product revision.* Determination of research subjects was conducted by purposive sampling, namely blind students of Gebang High School Students Surabaya. Schematic stages are specifically seen in chart 1 below.

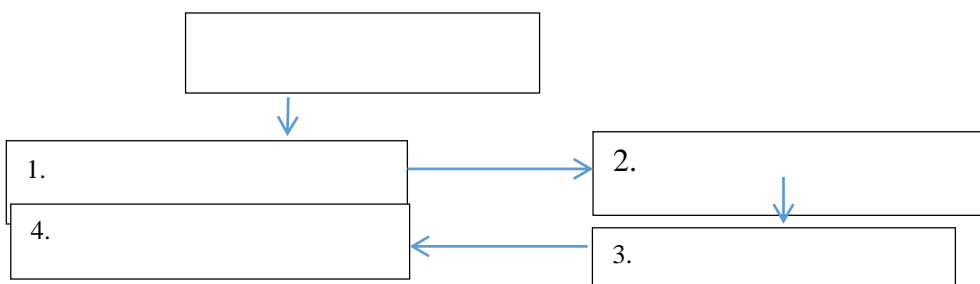


Figure 1. Research Chart

### 3.2. Data Collection Techniques

The assessment form is provided to collect the data from the student's performance test. It needed in order to know the results of student's performance in applying the mock-up through their mobility in school environment. The assessment is conducted based on learning needs on the various different spaces at school environment. The characteristic of the assessment is categorized through four aspects. These are: the distance from the started point to the intended destination, the accuracy of the intended destination, the smoothness to the intended destination and the student's independent.

### 3.3. Data Analysis Techniques

The analysis technique in this study uses the scoring system that is obtained by each student. The acquisition of this data from main field testing and operational field testing resulting from performance in the orientation and mobility of each visually impaired students in the Special School. The results of the implementation of the data were analyzed in a percentage technique through the formula below:

$$\text{Percentage} = \frac{\text{X (Total Score obtained)}}{\text{n (the number of maximum score)}} \times 100\%$$

The criteria used for decision making from mock-up evaluation analysis after being tested in the following table.

Table 1. Criteria for Evaluating Product Trials in the Implementation of Orientation and Mobility Interactive Multimedia Mockups to instill the mastery concept of school environment in visually impaired students.

Level of Achievement	Qualification
85% - 100%	Excellent
70% - 89%	Good
55% - 69%	Average
40% - 54%	Fair
0% - 39%	Poor

## **4. RESULTS**

### **4.1. Main Field Testing of Interactive Multimedia Mock-Up to Instill the Mastery Concept of School Environment on Visually-Impaired Students**

The results of interactive multimedia models based on orientation and mobility require conformity with the rules of existence of the theory. If the development stage or process is carried out correctly, a good or representative product is produced according to the needs of the target audience. At the stage of the process of developing interactive multimedia models based on orientation and mobility to instill mastery of the concept of the school environment for visually impaired students, referring to research on model of Gall, Gall and Borg (2003: 775). The steps in the implementation phase of interactive multimedia models based on orientation and mobility to instill mastery of the concept of the school environment were tested on visually impaired students as the subject of research. In the implementation of this small-scale trial the subjects are Visually-Impaired Junior High School students with a total of 27 people.

Based on the above subjects, orientation and mobility learning interventions are carry out by referring to the learning implementation plan found in the Visually-Impaired Junior High School students. The implementation of orientation and mobility learning for small-scale trial implementation in order to instill mastery of the concept of the school environment which amounted to 27 students from class VII to class VIII using interactive multimedia model.

The results of the acquisition of small-scale trial data on the visually impaired students of Special School for Junior High School show in the table below which is classified based on the average score of the performance assessment.

Table 2. Recapitulation of Small-Scale Test Results Based on Average Score of Orientation and Mobility Using Interactive Multimedia Mockups to Embed Mastery of Concepts of School Environment for Visually-Impaired School for Junior High School Students

No	The Number of Student Score	Average Score (Percentage)	Predicate
1	4 visually impaired student	85% - 100%	Excellent
2	12 visually impaired student	70% - 84%	Good
3	8 visually impaired student	55% - 69%	Average
4	3 visually impaired student	40% - 54%	Fair
5	0 visually impaired student	0% - 39 %	Poor

Based on the results of the main or small-scale field test on the assessment of mastery of orientation and mobility learning skills in the use of interactive multimedia mockup products to instill mastery of the concept of school environment classified on the predicate average. The direction of the implementation of the intervention is using interactive multimedia models based on orientation and mobility to embed the concept of a packaging environment from the special school visually-impaired students landscape of A Pilot Project Surabaya. This orientation and mobility learning intervention is to strive to learn to recognize the layout of each building and achieve the desired destination from one place to another in the area of visually impaired students. This interactive multimedia model format is based on orientation and mobility as a learning resource for instilling the mastery of the concept of the exceptionally visually impaired school environment. Its application refers to the manual that has been prepared in the use of interactive multimedia models based on orientation and mobility.

#### 4.2 Operational Product Revision

In principle, this interactive multimedia mockup product based on orientation and mobility experienced problems in repairing tools including the power button, roof of the market building, and braille writing in some collapsed

buildings. This condition is an obstacle when implementing orientation and mobility learning interventions. When visually impaired students are curious about interactive multimedia mockups, so when doing touching (tactile) by touching the building and looking for the information button, the roof of the building is peeling off. In addition, interactive multimedia mockups require routine maintenance and checking as one of the improvement programs. Based on the problems in interactive multimedia models based on orientation and mobility to embed the concept of environment, it requires improvement as follows.

Table 3. Revision of Interactive Multimedia Mockup Products Based on Orientation and Mobility to Embed the Visually-Impaired School for Junior High School Environmental Concept.

No	Tool	Repairment	Information
1	Power Button	Replaced with the new one	Buy a sturdy tool
2	Acrylic for maket buildings roof	Need to be glue	Buy a good quality glue
3	Braille peels writting on the maket building roof	Replace and glue again	Rewrite braille writing and buy quality glue

#### **4.3 Operational Field Testing of Interactive Multimedia Mock-Up Based on Orientation and Mobility to Instill the Mastery Concept of School Environment in Visually-Impaired Students**

In the process of developing interactive multimedia models based on orientation and mobility to instill mastery of the concept of the school environment in blind students, this includes exposure to operational field testing or extensive field trials. The steps in the stages of product implementation of interactive multimedia mockup development based on orientation and mobility are by taking data from the visually impaired students of X, XI and XII grades in Visually-Impaired High School. The implementation of a large-scale trial of interactive multimedia maket products based on orientation and mobility is 9 people of Visually-Impaired Senior High School as the subject. Orientation and mobility learning interventions by referring to the learning implementation plan found in Visually-Impaired High School. The implementation of orientation and mobility learning for the implementation of large-scale trials or extensive field testing of

orientation and mobility learning to instill mastery of the concept of school environment amounted to 9 Senior High School Students from X to XII grades using interactive multimedia maket products. The results of the acquisition of large-scale trial data on 9 Senior High School Students showed in the table of recapitulation of achievement of orientation and mobility learning skills using interactive multimedia models to instill mastery of the concept of visually impaired special school environments classified according to the average score assessment performance in the following table.

Table 4. Recapitulation of Operational Field Testing Results Based on Average Learning Scoring system on 9 Senior High School Students

No	The Number of Student Score	Average Score (Percentage)	Predicate
1	5 Visually impaired students	85% - 100%	Excellent
2	4 visually impaired student	70% - 84%	Good
3	0 Visually impaired students	55% - 69%	Average
4	0 visually impaired student	40% - 54%	Fair
5	0 visually impaired student	0% - 39 %	Poor

#### **4.4 Final Product Revision as a Finishing Products for the Development of Interactive Multimedia Mock-Up Based on Orientation and Mobility.**

After the interactive multimedia model based on orientation and mobility in its implementation, the acquisition of large-scale trial results shows that it can be mastered as well as an understanding of factual, conceptual knowledge and procedures regarding the location of .products based on orientation and mobility to instill mastery of the concept of the special school environment for the visually impaired students can potentially help in an easier way to get to the building desired by the visually impaired students. Therefore, to repair this product requires a budget for maintenance of special devices in the Audio Program Log Diagram

for Interactive Multimedia Applications in Mockups. In addition, only electrical equipment which is need checking again as a maximum maintenance step for its use. That is how finishing products develop interactive multimedia models based on orientation and mobility to instill the mastery of the concept of the exceptionally blind school environment.

## **5. Discussions**

In the product of interactive multimedia mockups development based on orientation and mobility to instill mastery of the concept of school environment in visually-impaired students, in the third year this resulted in finishing products based on the results of effectiveness tests in small-scale and large-scale trials in of Visually-Impaired High School students. The implementation of small-scale trials on 27 Visually-Impaired High School students has constraints in interactive multimedia market devices that experience improvements such as on the power button, roof of market buildings, and braille writing on some peeling buildings. This proves that electrical goods need maximum maintenance and checking before and after use. Moreover, the product in its application needs a form of touch for how to use it for the visually-impaired students.

The implementation of a large-scale trial field in 9 students with Visually-Impaired High School is very successful. In this revision phase, the focus is specifically on the maintenance needs of the audio program log diagram for interactive multimedia applications in models. Including tools that are displayed in market buildings requires a re-check to measure the strength. The achievement of measurement results for students Visually-Impaired High School through orientation and mobility learning skills showed that blind students showed fluency and accuracy in achieving their goals or that there are no doubts about going to their destination. But there are disadvantages when wllaking from a distance to a place that is not as targeted. This is confirmed by Hosni, (1996) that visual impairments people who experience obstacles in their sense of sight, but have an advantage in actualizing their potential when given the opportunity to participate in education to achieve future expectations. It means that even though there are shortcomings in their eyesight, they are able to master and understand such factual, conceptual and procedural knowledge about the location of the terrain they are taking. The use of representative media for visually impaired students can make them to be more confident and independent in mastering the environment around them.

According to Ungar, Blades, and Spencer (1999), showed that the mastery concepts for visually impaired students with the use of embossed maps and mock-



up in informing the understanding of learning in an environment setting (outdoor) is relatively challenging for the students. Conversely, if the orientation and mobility abilities possessed by the visually impaired students are limited, then it negatively affects the introduction of the surrounding. If visually impaired students have some obstacles in mastering the concept of environment, then their orientation and mobility can be disrupted automatically. The tendency that occurs in visually impaired students is to be passive in moving for fear of getting lost or walk compilation damage in surrounding. This is reinforced by Lowenfeld in Lydy Reidmiller, Lauri (2003), stated that visual impairment in a person can lead to three forms of limitations, such as (1) the limitation of concepts and experience diversity, (2) the limitation in interacting with the environment, (3) the limitation in orientation and mobility. The improvement stage that is conducted in this study in order to produce the final product (finishing), as a step to prepare the results of media in learning orientation and mobility of visually impaired student in an interactive, comfortable, safe and pleasant environment, and it has a potential to make the students easier to go to one building to one another . The following is an overview of finishing products.



Figure 2. The Form of Interactive Multimedia Mock-up Based on Orientation and Mobility, (Finishing).

### **5.1. The Effectiveness of Orientation and Mobility Interactive Multimedia Models Products To Instill the Mastery Concept of Special School Environments for Visually Impaired Students.**

Furthermore, in relation with the education services for visually impaired children needed has special principles (Hosni, 1996), such as 1) scale of mental development, 2) dexterity of orientation and mobility, 3) performance, and 4) repetition in providing learning. According to Hadi (2005: 2) stated that education services for visually impaired students to be able to live independently and move like normal people should be adjusted to their potential and needs as visually impaired people. The practical realization that should be done by a teacher is in the following two ways, the first step is by providing orientation and mobility skills to visually impaired students. So it can be used as a guide for them to carry out various activities in the school environment. Meanwhile, the second step is to develop a learning media that can provide an overview of the school environment to visually impaired students. Because special education services for students with visual impairment are needed in their life activities. In connection with the principle of the need for interactive multimedia model prototype products based on orientation and mobility as one of the appropriate media with the conditions of visually impaired students to conduct learning activities in their environment.

The Follow-up in the process of learning activities in students with visual impairment must use strategies that are appropriate to the needs and characteristics of the child. This is the same with Makhsunah's opinion (in Rahardja, 1994) which states that there are learning strategies in the education of visually impaired children based on two thoughts, these are: (1) an efforts to modify the environment to suit the child's condition, and (2) an efforts to utilize the senses that are still functioning optimally to compensate the weakness caused by loss of visual function. Optimizing the senses that are still functioning is a learning strategy that is appropriate and easy to implement in learning activity, In this case an optimal and integrated utilization can determine success in learning.

Based on the explanation above, the interactive multimedia mock-up products based on orientation and mobility are designed with regard to the characteristics of visually-impaired students, which are very sensitive in touching and hearing. Thus, interactive multimedia models based on orientation and mobility to instill the mastery concept of school environment intended for visually impaired students are developed by integrating tactual aspects and audio programs. It means that the prototypes development of interactive multimedia mock-up that are designed is based on learning technology. Learning technology (instructional

technology) in the design, development, utilization, management and evaluation of processes and sources for learning (Seels, B. Barbara & Rita C. Richey. 1994). This was confirmed by Hosni (1996) about visually impaired people who have obstacles in their sense of sight, but have an advantage in actualizing their potential when given the opportunity to participate in education to achieve future expectations. Then in providing educational services for the visually impaired students that are specifically needed is the availability of special programs that are connected with the orientation and mobility.

According to Lahav, O and Mioduser, D. (2002), said that orientation is the ability to understand the relationship between one object and another; creation of a mental pattern from the environment. Whereas mobility is meant to include the acquisition of skills and techniques that make people with visual impairments are able to travel more easily in their environment. Mobility training includes the acquisition of skills and techniques which makes people with visual impairments able to travel more easily in their environment. In orientation and mobility, the concept of direction and distance are two important things that must be understood by visually impaired students. By understanding the concepts of direction and distance, visually impaired students will be able to mobile appropriately and effectively. Right, it means that students can reach their destination according to what they want. While effective means students can get to the desired destination safely with a short time.

The understanding of wind direction concept is very useful to build the independence of visually impaired students in orientation and mobility in the school environment. This concept provides and instills understanding to the students about the eight directions of the wind direction and how to determine angles that is formed by a certain wind direction. The wind direction is very important to know and understand for the visually impaired student through direct practice. But for visually impaired students who are still considered as children, the concepts of left, right, front and back are directional concepts that need to be introduced first.

The concept of distance also requires good understanding by visually impaired students. This is important, so that students are able to estimate the time they will travel to get to a place they want. Therefore, orientation and mobility for distance measurements are generally used, such as meters, fathoms, and footsteps. But for the visually impaired people the need for orientation and mobility using footsteps will make it easier for them to know the concept of distance. In relation with the concept of direction and distance, competency as one of the important things that can be understood by visually impaired students when they want to

know the school environment well. This embodiment is the mastery concepts about the school environment that are reflected in the thinking of visually impaired students. In order to instill the mastery concept in the mind of visually impaired students is not easy. For students who are blind since they born, they are poor in concept. It is difficult for them to describe an object, especially if the object described is only informed through verbal language. Similarly, for the students who are blind because of an accident, the concepts they have have not been able to support the creation of their cognitive mapping of objects that are too broad. Therefore, it is necessary to have a concrete media for the depiction of the school environment that can be directly observed by visually impaired students through hearing and feeling.

The tactile aspect is manifested in the form of building imitations, road access, and other physical components that is available in the mock-up. Audio programs that available in the components of interactive multimedia mockup products based on orientation and mobility are completed by braille information that can be touched by visually impaired students. Furthermore, the audio program can be played in the form of road route guidance available in the interactive multimedia mockup building based on orientation and mobility to instill the mastery concept of school environment. It was stated by Heinich, Molenda, Russell and Smaldino (2005: 229), saying that multimedia refers to various combinations from two or more media formats integrated into the form of information or learning programs. Interactive multimedia mockup products based on orientation and mobility to instill the mastery concept of school environment intended for visually impaired students, equipped with a controller that can be operated by users. This utilization is able to choose one place to another for the process of social interaction. The most important characteristics of interactive multimedia mockup products based on orientation and mobility as part of the demand to interact from one place to another during learning in their learning environment.

Therefore, multimedia model activities in prototype products use the ASSURE model developed by Smaldino, Sharon E & Russell, James D (2005), producing interactive multimedia model prototype products based on orientation and mobility to instill the mastery concept of school environment in SLB visually impaired students with realization of design products with their characteristics, the following are available.

- a. Interactive multimedia mockups based on orientation and mobility with directions

- b. Guide buildings and roads access to various places in the school environment with the concept of audio and braille writing programs
- c. Operation of pressing keys according to the desired destination and available on the prototype product model building of the school environment
- d. Assessment tool for mastering environmental concepts with authentic assessment as a success in orientation and mobility.

The effectiveness of this interactive multimedia based orientation and mobility mockup product that is implemented for the visually impaired student, is primarily the character of each individual. Besides, it is being supported by courage, independence and support of the surrounding environment to achieve the mastery concept of the environment with maximum results for the visually impaired student. The representative media assistance for visually impaired students can help their daily life activities in socializing and communicating. Especially in today's digital era, humans want something fast and precise without the exception of those with special needs. This orientation and mobility learning intervention is to strive to learn in recognizing the layout of each building and reach the desired destination from one place to another in the environment of visually-impaired students. In its application refers to the manual book that has been prepared for the use of interactive multimedia models based on orientation and mobility. According to Prastowo (2013: 247) states that models or mockup that is made should be appropriate with the way of children thinking, especially those with visual impairment.

## **6. Conclusion**

Based on the results, it can be concluded that most of the visually-impaired student achieve a good predicate in performing test. The classification of the result consist of 9 students are excellent, 16 are good, 8 students are average, and 3 other students have a fair predicate. For those who categorized as an excellent because the students are able to attain the intended destination correctly without bringing the stick. While, for those who raised a good predicate because the students are able to attain the intended destination correctly but they still can not be brave without the stick. However, for the students who still in the average predicate because the students are lack of self-confidence during the performance test. At least, the students who raised a poor predicate because the students are lack of self-confidence and can not be independent. Thus, it can be said that the existence of mock-up is considered as an effective media in assisting student's mobility in the school environment.

## 7. Suggestions

Based on the conclusion above, the suggestions in this study are directed in terms of further development research, as follows.

1. Followed up with community service to the environment of Visually-Impaired High School users who landscape each school as a partner to create interactive multimedia mockup media based on orientation and mobility.
2. Developed with the implementation of dissemination through education and training on socialization of interactive multimedia models based on orientation and mobility to instill the mastery concept of school environment in Visually-Impaired High School student.

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## Chapter 7

### **Active Learning To Improve Self-Learning Among Physical Education Teacher Education Students Improving Self-Learning Through Active Learning**

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**Abstract** - In achieving its 4th mission in the SDGs, namely improving the quality of education through the fulfillment of quality education, the form of demand for increased competence that is often encountered is when there is a change in curriculum. The Indonesian ministry Education rules has introduced active learning. PETE as a place to study teacher training and PE teaching needs to analyze the functioning of subjects related to the SDGs. During the implementation of ALM, it has never been analyzed in depth between the readiness and independence of student learning during the lecture. For this reason, it is necessary to analyze the readiness and independence of student learning in attending lectures to achieve the learning target. This article is part of the strengthening evidence that active learning models can build self-regulation and self-efficacy of prospective teachers in preparing themselves to be great teachers. A total of 142 prospective PE teacher students from four study groups who following the syntax of the active learning model completely in one semester were participated in this study. The measurement results of self-efficacy show that there is no difference in the value of student self-efficacy from the four classes, all students have readiness that is equally good at participating in ALM. Furthermore, it will be discussed about the differences in the characteristics of students based on class that require lecturers to adjust the implementation of the instructional model. In addition, learning activity will be discussed as the most important variable in explaining student self-regulation in successfully achieving academic achievement.

**Keywords:** instructional model, PETE student, self-efficacy, learning activity, and academic achievement

## 1. Introduction

Many studies have shown that teachers need to develop sustainable competencies (Evens, Elen, Larmuseau, & Depaepe, 2018; Vangrieken, Meredith, Packer, & Kyndt, 2017) because the quality of the teacher determines the quality of education services (Darling-Hammond, Sykes, & Sykes, 2003). Improving the quality of teachers, means helping the UN in achieving its 4th mission in the SDGs, namely improving the quality of education through the fulfillment of quality education (United Nations, n.d.). The form of demand for increased competence that is often encountered is when there is a change in curriculum. Teachers must update their knowledge of the curriculum until the development of competence to fit the demands of the curriculum (Coenders & Terlouw, 2015).

Speaking of the quality of teachers, universities are the agencies most responsible for teacher preparation. Universities are required to truly maintain their products starting from screening prospective teachers (Digiacinto, Bulger, & Wayda, 2017), the learning process, up to evaluating the competency achievements of students in accordance with national standards on an ongoing basis (Chen, 2003). Each university must provide quality lecture services to form great teachers. Conducting lectures that are appropriate for student learning is the core task of the lecturer in designing learning. At least there are two sides of conformity that need to be considered, namely in accordance with the demands of the times and in accordance with student learning needs. In accordance with the demands of the era at least is to prepare prospective teachers ready in the era of digitalization (Martin, 2018) and in accordance with student learning needs in achieving predetermined standards (Taliaferro, Ayers, & Housner, 2017). For this reason, the university should have changed passive learning into active learning by involving students with the contents of learning in the real world to hone problem solving skills and critical thinking skills (Nelson & Crow, 2014).

Active learning is defined as learning that focuses on involving students to be active in learning activities to interpret all forms of learning activities related to learning goals. The focus of active learning is to make the students guided to get an independent learning experience in a collaborative, cooperative and problem-based atmosphere (Prince, 2004). The independence of learning prospective teachers to get teaching material can be facilitated by integrating distance learning and face-to-face with digital learning in the form of blended learning to meet material needs (Buran & Evseeva, 2015). In addition, this strategy has proven to provide a habit of independent learning to foster lifelong learning needs, provide an easy and unlimited source of learning (Yao, 2019). Collaborative and

cooperative learning environments can only be realized with a learning atmosphere that is designed in the form of groups so that the occurrence of active learning activities (Johnson & Johnson, 2008). In collaborative learning situations students can discuss each other about goals, share ideas, and help each other in solving problems. Problem solving is an important skill in the 21st century. Problem solving is seen as a collection of skills, knowledge and abilities needed to deal effectively with complex situations that are not routine in different domains. (Funke, Fischer, & Holt, 2018).

In this article, we will explain the advantages of active learning models that have been developed since 2006 in athletic lectures. Active learning models to date have provided a minimum of four facilities, namely providing virtual learning facilities (<https://vi-learn.unesa.ac.id>), personal account of log-activity (<https://atletik.unesa.ac.id>), event organizer, and assisting the school (Suroto, 2018). Learning activity is a variable that becomes a reference as a form of active self-learning students consisting of activities related to the content of learning, assignments, quizzes, and face-to-face activities. The application of active learning relies on the level of learner self-regulation as the ability to organize learning processes independently in achieving learning goals (Eekelen, Boshuizen, & Vermunt, 2005). The level of student learning participation as a learning activity becomes a measure used as active student participation in organizing their learning activities independently. This self-regulation ability is then directed at self-efficacy, namely a person's self-confidence in his ability to achieve goals (Albert Bandura, 2006). Self-efficacy In learning is the confidence of learners to be able to use their potential in achieving learning goals. The person's self-confidence in self-efficacy is the focus on seseorag's judgment on their ability (Albert; Bandura, 1997). Self-efficacy is considered as a requirement for behavior change so that it is expected to contribute to the activeness of students in organizing learning activities independently to be more active in learning (Annesi & Gorjala, 2010). This article is also evidence of efforts to reform the learning system carried out at PETE in an effort to improve the productivity of teaching at the university in preparing great teachers especially for physical education teachers.

## **2. Material And Methods**

### **2.1. Participants**

A total of 142 students in athletic learning courses were the subjects of research that had been formed into four groups (group 2018A, B, C, and D) based on the recruitment process. Participants were 83 male and 59 female aged 18 to 24 years ( $M = 20.2$ ,  $SD = 0.78$ ). They follow the face-to-face learning process and

independently through virtual learning, personal accounts, and social media. The length of the lecture was held for 16 meetings.

## 2.2. Measures

**Academic achievement.** It is interpreted as the learning achievement of students in mastering various competencies determined at the beginning of the lecture. The four components of the assessment are used as references to determine the final academic achievement score, namely participation, task, summative-1, and summative-2. Participation has a weight of 20%, task of 30%, summative-1 of 20%, and summative-2 of 30%. Each component has its own component as an indicator of completeness.

**Self-efficacy.** Measurement of self-efficacy using the Authentic Learning Self-Efficacy Scale (OALSS) Online questionnaire that has been proven to be valid and reliable (Tezer et al., 2018). Measurements are made on nine dimensions, namely Dimension I: problem solving skills and bonding; Dimension II: metacognitive skills and permanence in learning; Dimension III: relation with real life environments and interaction in online environments; Dimension IV: interaction with real life and learning experiences; Dimension V: creating social bonds in online collaborative learning environments; Dimension VI: structured support in effective learning and internalising information; Dimension VII: keeping up with technological advancements; Dimension VIII: multiple evaluation and feedback; and Dimension IX: collaborative working skills and product development.

**Self-regulation.** It is interpreted as the thinking power and behavior of students who are systematic in regulating the learning process to achieve the learning target (Usher, 2012). Furthermore, in this study it is interpreted as learning activity. Learning activity measurement uses four things, namely the number of learning activities recorded in personal account of log-activity (<https://atletik.unesa.ac.id>), the number of quiz activities through virtual learning (<https://vi-learn.unesa.ac.id>), face-to-face lectures, and assignments. Log-activity is a student learning activity in achieving the predetermined targets in each task. Quiz activity is an effort for lecturers to provide a vehicle for independent learning (through online) to students in understanding learning material. Face-to-face lectures are the activities of students in participating in lectures. Assignment is the independence of students in choosing the weight of the task in accordance with their beliefs in completing the assigned task. Based on these four things, it can be determined the independence of student learning which is then considered as the level of student self-regulation in learning.

### 2.3. Procedures

#### *Active Learning Model*

The main purpose of students attending athletic learning courses are to understand the rules of athletic competition and apply them in competitions. For this reason, students are assigned to create event organizers to carry out athletic championships for elementary, middle and high school students. In the lecture process, students implement the Active Learning Model syntax with a summary of the process in the form of course orientation and contract, individual and group homework for knowledge, consultation in class, comprehensive knowledge test, knowledge application and simulation, individual and group homework for skills, event simulation, reporting, and final course for competency evaluation (see figure 1 and table 1).

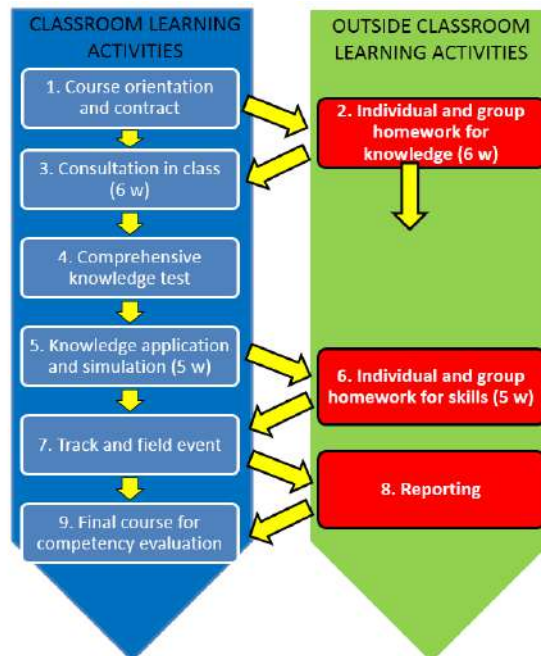


Figure 1. Active Learning Model Syntax

Table 1. Learning activities in active learning model

Syntax	Classroom learning activities	Outside classroom learning activities	Week
1. Course orientation and contract	1. Setting learning target 2. Learning materials 3. Scheduling		1

Syntax	Classroom learning activities	Outside classroom learning activities	Week
	4. Strategies		
2. Individual and group homework for knowledge		1. Reading text-book chapter 2. Committee group work 3. Online log-activity 4. Weekly committee meeting 5. Online chapter quiz 6. Collect evidence in portfolio	2-7
3. Consultation in class	1. Weekly learning target 2. Feedback and evaluation on self-learning 3. Presentation on IAAF competition rules 4. Task distribution on technical official 5. Simulation		2-7
4. Comprehensive knowledge test	Online test objective (summative-1)		8
5. Knowledge application and simulation	Event simulation for track and field (senior high school student, junior high school student, and elementary school student)		9-13
6. Individual and group homework for skills		1. Simulation for track event 2. Simulation for jump event 3. Simulation for throw event	9-13
7. Track and field event	1. Event simulation led by national referee 2. Event session 1 for senior high school student 3. Event session 2 for junior high school student		14

Syntax	Classroom learning activities	Outside classroom learning activities	Week
	4. Event session 3 for elementary school student		
8. Reporting		1. Achievement evaluation 2. Reporting learning processes and event activities (portfolio, log-activity, and individual report) 3. Reporting group activities	15
9. Final course for competency evaluation	Quizzes summative-2 (objective and subjective)		16

Lectures are designed in two ways, namely lectures in the classroom and outside the classroom. In the classroom carried out in a face-to-face manner to discuss about learning targets, strategies to achieve learning targets, and simulation of track and field event. Whereas outside the classroom is done by means of independent learning and collaboration between students in achieving the learning target. Outside the classroom, teacher monitoring is done by using Whatsapp Group, personal account in <https://atletik.unesa.ac.id>, and sharing material as well as performing quizzes in <https://vi-learn.unesa.ac.id>.

### *Scoring of academic achievement*

The definition of learning targets that must be achieved by students is learning achievement in athletic learning courses. The lecturer discusses various assessment components used which are then agreed upon by lecturers and students (table 2).

Table 2. Components of Student Learning Achievement Assessment

Evaluation component	Category	Proportion	Resource
<b>A. Participation</b>			
1 Daily attendance	(Part-1)*	60%	SIKADU (academic management system in Unesa)
2 Simulation attendance	(Part-2)	10%	Event simulation led by national referee
3 Event attendance	(Part-3)	30%	Attendance at event
<b>B. Task</b>			

<b>Evaluation component</b>	<b>Category</b>	<b>Proportion</b>	<b>Resource</b>
4 Quiz	(Task-1)	50%	Quiz score at Vi-Learning Unesa ( <a href="https://vi-learn.unesa.ac.id">https://vi-learn.unesa.ac.id</a> )
5 Assisting the school	(Task -2)*	30%	Event registration ( <a href="https://atletik.unesa.ac.id">https://atletik.unesa.ac.id</a> )
6 Learning evidence	(Task -3)	20%	Portfolio book
<b>C. Summative-1</b>			
7 Financial contribution	(S-1)*	60%	Sponsorship fund rising and individual contribution
8 Middle term test	(S-2)	40%	Middle term test score at Vi-Learning Unesa ( <a href="https://vi-learn.unesa.ac.id">https://vi-learn.unesa.ac.id</a> )
<b>D. Summative-2</b>			
9 Activities related event	(S-1)	60%	Log activity at Atletik Unesa ( <a href="https://atletik.unesa.ac.id">https://atletik.unesa.ac.id</a> )
10 Final test	(S-2)*	40%	Final test score
<b>Final Score</b>			20% Participation
			30% Task
			20% Summative 1
			30% Summative 2

**Catatan:** \*) obligatory

In accordance with the regulations of Universitas Negeri Surabaya (Unesa), there are four components of assessment used, namely participation, task, summative-1, and summative-2. Furthermore, the final score is considered as a student's academic achievement in mastering the expected competencies in an athletic learning course.

#### 2.4. Analysis

Academic achievement data and self-efficacy are then tested for validity using the internal-correlation. In addition, the internal consistency of the self-efficacy questionnaire was tested using cronbach's alpha. Anova was used to determine differences in self-efficacy and final four-class Academic achievement. Furthermore, tiered regression is used to explain the relationship between self-efficacy, self-regulation, and academic achievement.



### 3. Result

#### 3.1. Academic Achievement

There are A total of 142 students who were declared successful followed the syntax of ALM. Descriptive academic achievement shows that the final score is 81.6 (SD= 4.97) in the good category. The participation value is 89.1 (SD= 8.22), the assignment value is 85.0 (SD= 6.89), summative-1 is 86.9 (5.68), and summative-2 is 69.5 (SD= 8.02) (Table 3).

Table 3. Descriptive statistics and internal correlation matrix of academic achievement component

Evaluation component	N	Mean	Std.Dev	A	B	C	D	E
<b>A. Participation</b>	<b>142</b>	89.1	8.22		.115	.293**	.301**	.592**
1 Daily attendance		92.6	7.93					
2 Simulation attendance		77.6	34.72					
3 Event attendance		85.9	15.84					
<b>B. Task</b>	<b>142</b>	85.0	6.89			.418**	.232**	.663**
4 Quiz		80.6	13.73					
5 Assisting the school		91.1	2.01					
6 Learning evidence		86.9	3.75					
<b>C. Summative-1</b>	<b>142</b>	86.9	5.68				.380**	.684**
7 Financial contribution		100.0	0.00					
8 Middle term test		67.4	14.21					
<b>D. Summative-2</b>	<b>142</b>	69.5	8.02					.768**
9 Activities related event		73.0	7.47					
10 Final test		64.3	13.92					
<b>E. Final Score</b>	<b>142</b>	81.6	4.97					

Catatan: \*\*) Correlation is significant at the 0.01 level

Test the quality of the assessment component, then test the correlation between the value component and the final score. The internal correlation of each component of the assessment with the final value is stated to be significant at level  $p < 0.01$ .

#### 3.2. Self-Efficacy

The value of the correlation between factors and the total value of self-esteem shows that the correlation dimension I with others is in the value of 0.67 - 0.89 while the total value is 0.94. Correlation dimensions II with others are in the

value of 0.70 - 0.89 while the total value is 0.96. The third dimension correlation with the others is in the value of 0.68 - 0.88 while the total value is 0.93. Correlation of dimension IV with others is in the value of 0.62 - 0.86 while with a total value of 0.92. The V dimension correlation with the others is in the value of 0.72 - 0.87 while the total value is 0.93. The VI dimension correlation with others is in the value of 0.66 - 0.90 while the total value is 0.92. Correlation VII dimensions with others are in the value of 0.60 - 0.72 while the total value is 0.75. The dimension VIII correlation with the others is in the value of 0.67 - 0.90 while the total value is 0.94. Correlation of dimension IX with others is in the value of 0.60 - 0.82 while the total value is 0.86. The r value is significant at 0.01, which means that all dimensions are a harmonious whole in determining the value of self-efficacy so that the data obtained is considered valid (Table 4).

Table 4. Descriptive statistics, internal correlation matrix, and reliability of self-efficacy

	N	Mean	SD	D1	D2	D3	D4	D5	D6	D7	D8	D9	Total	Cronbach's Alpha
Dimension I: problem solving skills and bonding	142	4,03	0,55	1,00										0,90
Dimension II: metacognitive skills and permanence in learning	142	4,06	0,55	0,89	1,00									0,93
Dimension III: relation with real life environments and interaction in online environments	142	4,01	0,57	0,87	0,88	1,00								0,89
Dimension IV: interaction with real life and learning experiences	142	4,11	0,61	0,85	0,85	0,84	1,00							0,89
Dimension V: creating social bonds in online collaborative learning environments	142	4,05	0,61	0,84	0,85	0,83	0,86	1,00						0,89
Dimension VI: structured	142	4,07	0,62	0,82	0,86	0,82	0,84	0,86	1,00					0,87

	N	Mean	SD	D1	D2	D3	D4	D5	D6	D7	D8	D9	Total	Cronbach's Alpha
support in effective learning and internalising information														
Dimension VII: keeping up with technological advancements	142	4,11	0,72	0,67	0,70	0,68	0,62	0,72	0,66	1,00				0,88
Dimension VIII: multiple evaluation and feedback	142	4,06	0,61	0,83	0,88	0,83	0,85	0,87	0,90	0,67	1,00			0,94
Dimension IX: collaborative working skills and product development	142	4,03	0,61	0,78	0,77	0,82	0,75	0,79	0,82	0,60	0,81	1,00		0,82
Total	142	4,03	0,54	0,94	0,96	0,93	0,92	0,93	0,92	0,75	0,94	0,86	1,00	0,99

To meet the reliability requirements, each dimension and total items were tested using Cronbach's Alpha with results on dimensions I = 0.90, dimensions II = 0.93, dimensions III = 0.89, dimensions IV = 0.89, dimensions V = 0,89, dimensions VI = 0.87, dimensions VII = 0.88, dimensions VIII = 0.94, dimensions IX = 0.82, and total items = 0.99. All cronbach's alpha values > 0.70 indicate that the data obtained is considered reliable (Fraenkel, Wallen, & Hyun, 2009).

Student learning readiness is stated to be good with a value of self-efficacy of 4.03 (0.538) (Tezer et al., 2018). Self-efficacy was stated equally in each class (F = 1.324, p > 0.05), while for the final score it was stated differently (F = 6.580, p < 0.01). Significant differences occur in class A-C, A-D, B-C, B-D, and C-D while A and B are declared the same (Table 5).

Table 5. Results of Different Self-Efficacy and Academic Achievement using ANOVA

Variables	Group	N	Mean	Std. Deviation	F	Sig.	Conclusion
Self-Efficacy	2018A	36	4.04	0.58	1.098	.352	Same
	2018B	39	4.04	0.54			
	2018C	33	4.14	0.51			
	2018D	34	3.90	0.51			
	Total	142	4.03	0.54			
Final score	2018A	36	83.2	4.97	6.580	.000	2018A > C > D

	2018B	39	83.3	4.07			2018B>C>D
	2018C	33	79.9	5.86			
	2018D	34	79.5	3.71			
	Total	142	81.6	4.97			

#### 4. Discussion

Self-efficacy is an important psychological aspect in predicting student success in achieving academic achievement. However, at the higher education level, learning independence aspects are important to note because lecture models generally require independent students to learn. For this reason, self-regulation as part of self-efficacy needs to be examined in this study. Self-regulation is the ability of individuals to organize themselves in learning, for this reason, in this study self-regulation is interpreted in the form of learning activity (Table 6).

Tabel 6. Model Regresi antara Self-Efficacy, Self-Regulation, and Final Score

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.055 <sup>a</sup>	.003	-.004	4.97714	.003	.418	1	140	.519
2	.467 <sup>b</sup>	.218	.207	4.42341	.215	38.244	1	139	.000
3	.490 <sup>c</sup>	.241	.224	4.37512	.022	4.086	1	138	.045

a. Predictors: (Constant), Self-Efficacy

b. Predictors: (Constant), Self-Efficacy, Learning Activity

c. Predictors: (Constant), Self-Efficacy, Learning Activity, Product

In model 1, the contribution of self-efficacy as a final score predictor is 0.3%, the F value is 0.418 ( $p = 0.519 > 0.05$ ). This means that self-efficacy cannot predict the final score. In model 2, learning activity is able to be a good predictor of the final score, as evidenced by changes in effective contributions from 0.3% to 21.8%. The donation was declared significant with an F value of 38,244 ( $p = 0.000 < 0,01$ ). In model 3, the product is able to predict the final score so that the effective contribution of 21.8% to 24.1% with a value of  $F = 4.086$  ( $p = 0.045 < 0.05$ ). So it can be concluded that self-efficacy and self-regulation together can predict the height of the final score. In addition, self-regulation has also been shown to moderate the relationship between self-efficacy and the final score.

Based on the results of the study indicate that there is a positive contribution of self-efficacy to student learning outcomes through self-regulation. So that student learning independence in active learning in achieving the target of learning becomes a good mederator in determining academic achievement. These

results are in accordance with the results of other studies that show that learning that utilizes the independence of learning learners in the form of self-regulation can affect self-efficacy which can further improve learning achievement (Lai, Hwang, & Tu, 2018).

The score of log-activity is the value obtained from the number of learning activities independently in mastering the material and increasing the competencies related to athletic learning. The results showed that there was no correlation between self-efficacy and the score of log activity. This is contradictory to the notion that self-efficacy is a very effective predictor of student learning motivation variables (Zimmerman, 2000). Students with high self-efficacy should have high motivation in learning which then performs a lot of learning activities related to achieving learning goals. But in this case it is different, namely there is no correlation between self efficacy and self-learning activities.

Problem solving is expected to be honed from the student learning experience that comes from learning activities. The results of the study show that the higher the dimension I, the higher the student learning activities. It can be explained that the learning materials and activities not only come from teaching material as lecture material, but the learning process in real situations on the ground is deliberately designed to provide meaningful experiences to students in order to achieve the goals. The real condition is in the form of an athletic championship situation involving agencies, schools, coaches, teachers, and students (as athletes). This condition will automatically bring up problems that need to be faced and resolved by students. This condition is expected to lead to complex learning situations outside the learning routines that will create problems at any time to become a vehicle for student learning in honing problem solving skills. The officiating activity is a task designed to be a long project for students at the end of the lecture. So that the success of active learning is in accordance with the results of research that shows that students in project assignments can independently learn to increase critical thinking according to their self-regulation abilities (Stefanou, Stolk, Prince, Chen, & Lord, 2013).

The execution of these assignments for one semester is carried out in groups, both in small sizes and covering all students. Each small group has a coordinator and the big one even has a general chairman. The formation of this group is expected to provide a collaborative learning environment so that it can influence the self-efficacy of those who have a tendency to have learning weaknesses. (Araban et al., 2012). So that later they will be carried away by students who have higher learning activities.

## 5. Conclusion

Active learning models have a focus on involving students in the active learning process independently. It is no longer only oriented towards achieving the highest score but more process oriented. With the learning conditions that integrate digital learning and face-to-face material can be conveyed so that students can take full material. Furthermore, assignments with project systems can provide a learning environment that encourages students to manage each learning process independently, manage learning outcomes independently, and are product oriented. In addition, a collaborative learning atmosphere is formed so that it can foster mutual assistance and support development among students. The entire process mentioned above has become the target of implementing active learning models, but this article shows that from all the processes that have been passed it can also show that in the atmosphere of active learning the self-efficacy model is proven to be a predictor of student activity in attending lectures. So that it can be expected that the more active students in learning can improve learning achievement.

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## Chapter 8

### Semantic Sanji Jukugo In Yukiguni (Snow Country): The Interpretation Of Kawabata Yasunari

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**Abstract** - Sanji jukugo is defined as a combination of three kanji. Sanji jukugo (a combination of three kanji) are classified into two function, composing and mentioning one by one the kanji characters and combining one-character vocabulary with two-character vocabulary. Sanji jukugo (a combination of three kanji) is very close to the semantics because semantics examine meaning or meaning. The semantic meaning of Sanji jukugo (a combination of three starches) in the Yukiguni (Snow Country) novel by Kawabata Yasunari can also be analyzed by semantic theory. In the Yukiguni (Snow Country) we can see the sanji jukugo (Combined three kanji) used by Shimamura as a male figure and Komako and Yuko as other female and character figures. The problem in this study are How is the formation of Sanji jukugo (a combination of three kanji) in Yukiguni (Snow Country) by Kawabata Yasunari and What is the semantic meaning of Sanji jukugo (a combination of three kanji) in Yukiguni (Snow Country) by Kawabata Yasunari. This research activity uses a qualitative design. The use of Japanese can show the femininity and masculinity of the speaker because in Japanese there are female language and male language.

**Keywords:** Kanji, Sanji jukugo (a combination of three kanji), Yukiguni (Snow Country), Semantics

#### 1. Introduction

Sanji jukugo is interpreted as a combination of three kanji. As stated by Shigeo (1981: 120) that jukugo consists of two kanji (Niji jukugo) cans, three kanji (Sanji jukugo), four kanji (Yonji jukugo), etc. In Japanese the vocabulary formed by a combination of two kanji (Niji jukugo) was ranked first, followed by a vocabulary formed from a combination of three kanji (Sanji jukugo) which was ranked second. From Shigeo's statement, it can be concluded that the more the combined number of starches, the less the number of vocabulary. A combination

of three kanji (Sanji jukugo) is also found in the novel Yukiguni (Snow Country) by Kawabata Yasunari.

According to Sasaki (1987: 195), the novel Yukiguni (Snow Country) is the main literary work of Kawabata Yasunari who in 1968 received the Nobel Prize for Literature. This novel was cited as especially outstanding by the Nobel committee in 1968, the year Kawabata won the Nobel prize for literature. However one must consider that no one on the committee could read Japanese and therefore did not have access to the majority of Kawabata's works. On the other hand, the other author said that the novel Yukiguni (Snow Country) is a unique combination of classical and modern elements, so it deserves a Nobel prize (Fanani,2002:37).

In the Yukiguni (Snow Country) novels we can see the sanji jukugo used Shimamura as a role as a male character and Komako and Yuko as female characters. Shimamura lived a luxurious life from his parents' inheritance, while Yoko was a geisha. Komako is not a geisha but often entertains guests when all geisha are busy. Sanji jukugo in Yukiguni (Snow Country), an example is Shingousho ni kisha ga tomatta (The train stopped at the signal station). Shingousho if written in kanji is 信号所, which means signal. Shingousho consists of two words, namely Shingou which is a traffic light and sho which means place. Whereas the meaning of the signal here means a place where there are traffic lights in this case at the train station. We all know that the main transportation in Japan is trains because the trains there are known to be safe, inexpensive, and always on time. From this description, it can be concluded that the sanji jukugo consists of niji jukugo (a combination of two stiches) and added one starch so that it becomes sanji jukugo.

The meaning of Sanji jukugo can be analyzed by semantics because as we know the topic of semantic involvement in naming and lexical decision for Japanese kanji compound words is not new and already exist. For example, a series of experiments was carried out on semantic processing for kanji. Saito (1981) showed that words presented in kanji were named more slowly than when they appeared in the Japanese syllabic (precisely, a unit of mora) symbols of kana. This case was reversed when subjects performed the task of semantic decision: words in kanji were processed more quickly to make sentence acceptance judgments than those in hiragana. Also, Kimura (1984) has found and stated vocal interference did not affect kanji processing, but that it interrupted hiragana processing. These findings led to the generally-held belief (e.g., Feldman & Turvey 1980; Goryo 1987; Kaiho & Nomura 1983; Kimura 1984; Kimura & Bryant 1983; Morton & Sasanuma 1984; Saito 1981) that, for naming, kanji are processed from

orthography via the semantic level to phonology whereas kana are processed from orthography to phonology.

From the description above the formulation of the problem in this study are

1. How is the formation of Sanji jukugo (a combination of three kanji) in Yukiguni (Snow Country) by Kawabata Yasunari
2. What is the semantic meaning of Sanji jukugo (a combination of three kanji) in Yukiguni (Snow Country) by Kawabata Yasunari

### **The Benefits of Research**

Meanwhile, the benefits of this research consist of theoretical benefits and practical benefits. Theoretical benefits are expected to add insight into Japanese language learners especially about 三字熟語. While the practical benefit is being able to understand the existence of kanji in daily life.

## **2. Literature Review**

By the problems examined, the theory used in this study is about Kanji, Sanji jukugo, and Semantics meaning.

### **2.1. Kanji**

Kanji is the letter used by Japanese people in written communication. The kanji that must be studied by Japanese people is three thousand kanji to be able to read Japanese newspapers. According to Tamaoka (2005) the number of kanji is quite large; one to know as many as 3,000 kanji characters to read newspapers and ordinary texts. Furthermore, many of these characters are complex, as well as distinct from one another, in a visual configuration. A single kanji is often a word, but the majority of physical items are made up of two or more kanji characters. A single star character usually has two or more pronunciations. Historically, kanji was born in China about 5000 years ago. As stated by Shigeo (1981: 120) kanji was born in China about 5000 years ago with an amount of around 50,000 letters. But in reality, there are around 5,000 letters used. The kanji letters spread in Japan 1700 years ago after first passing North Korea.

### **2.2. Sanji Jukugo (a combination of three kanji)**

It was explained earlier in this study that the word sanji jukugo consists of two words, namely nihi jukugo (a combination of two kanji). In its formation, according to Shigeo (1987: 200) Sanji jukugo (a combination of three kanji) is classified as follows:

1. Arrange and mention one by one the kanji characters

Example:

a. 松竹梅 (Shouchikubai)

松 (matsu: Pine) 竹 (take: bamboo) 梅 (ume: plum)

Sanji jukugo 松竹梅 (Shouchikubai) is a similar combination of starch, namely pine, bamboo, and plum. Please note that these three trees always exist every year in order to commemorate the new year and are used by Japanese for decoration in front of the house.

b. 上中下 (Jouchuuge)

Sanji jukugo 上中下 (Jouchuuge) is a combination of the upper, middle, and lower starch, which is an illustration of the ability to learn Japanese, namely by the existence of advanced, intermediate, and basic levels.

c. 市町村 (Shichouson)

Sanji jukugo 市町村 (Shichouson) is a combination of city, village and hamlet kanji. This Sanji jukugo (Combined three kanji) describes the form of regional division in Japan.

2. Combine 1 character vocabulary with 2 character vocabulary.

Example:

a. 同窓 - 会 Dousoukai (Reunion)

Sanji jukugo 同窓 - 会 Dousoukai (Reunion) is a combination of kanji 同窓 dousou and 会 kai, where 会 kai means meeting. So that 同窓 - 会 Dousoukai can be interpreted that reunion is a meeting of fellow friends.

b. 運動 - 場 Undoujou (Athletic field)

Sanji jukugo 運動 - 場 Undoujou is a combination of kanji 運動 undou and 場 jou, where 運動 undou mean sport and 場 jou mean wide place. So that 同窓 dousou and 会 kai mean a field for exercise or a sports field.

c. 外国 - 人 Gaikokujin (foreign)

Sanji jukugo 外国 - 人 Gaikokujin (foreign) is a combination of starch 外国 Gaikoku which mean overseas and 人 jin mean people. So that 外国人 Gaikokujin can be interpreted as a person from abroad or a stranger.

From the opinion of Shigeo and the example above, it can be said that sanji jukugo is classified into two, namely compiling and mentioning one by one the kanji characters and combining one-character vocabulary with two-character vocabulary.

### 2.3. Semantics Meaning

In its use, a word cannot be interpreted only based on a dictionary, but wider than that. This is in accordance with what was revealed by Pateda (1989: 16) that sometimes we are not satisfied with the meaning contained in the dictionary for a word that we are looking for its meaning. According to Verhaar in Pateda (1994: 91), the meaning is very close to semantics, because semantics mean the theory of meaning or the theory of meaning that is a systematic branch of language that investigates meaning or meaning. In the semantics itself, there are idiomatic meanings, which according to Soedjito (1992: 101) idioms are language expressions in the form of a combination of words (phrases) whose meanings are united and cannot be interpreted with the meaning of the constituent elements. In line with this opinion, Miyaji (1990: 239) said that *Kanyōku to iu nowa tango no futatsu ijō no renketsutai de atte, sono musubi tsuki ga hikaku teki kataku, zentai de kimatta imi wo motsu kotoba to nobete iru.* (Idiom is a concatenation of two or more words and the connection is relatively and saying words with meaning).

From this opinion, it can be concluded that idioms are a combination of words (phrases) whose meaning is not the same as the meaning of the words that make it up. Semantics as the science of learning the meaning, can not be separated from the form of words that enter the realm of stylistics. According to Turner (1983: 8) stylistics mean the study of style, with a form of the word, of the scientific or at least a methodical study. In addition, to analyze a discourse, discourse analysis or discourse analysis is needed. According to Stubbs (1983: 1), the term of discourse analysis is very ambiguous because discourse analysis is also concerned with language in use in social contexts. While the definition of discourse according to Schiffrin (1998: 32) definition of language is consistent with functionalism in general, discourse is viewed as a system through a particular function are realized.

Semantics in Japanese are called 意味論 imiron, so lexically imiron is the theory of meaning. Kindaichi (1988: 242) states that the subject of the semantic problem is describing and analyzing each word's meaning. Some researchers who have examined phonology and orthography are now building on those results by including arguments regarding semantics, and there is a great possibility of interactive activation among representations of orthography, phonology, and

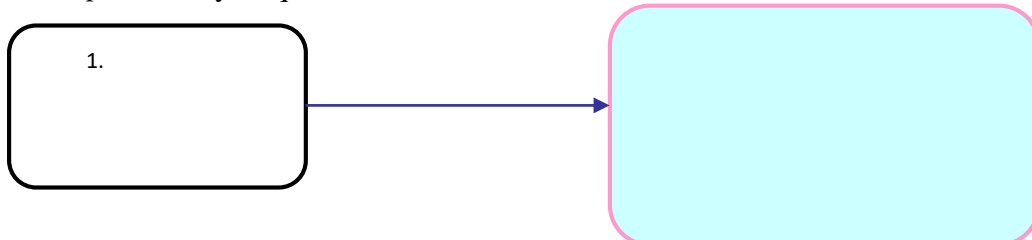
semantics, and even of interplay at both the word and morpheme levels which may lead to a model of multiple-level interactive activation for morphologically compound words. Thus, the present study focused upon the semantic processing of kanji in order to examine the involvement of morphological semantics for the processing of kanji compound words. Various studies on semantic variables at the word level have been conducted using the tasks of lexical decision and naming. When a word has multiple meanings (i.e., is a polysemous word) lexical decisions regarding it are normally faster than for words with few meanings. For example, the word ‘bank’ is polysemous in that it can mean ‘a financial institution’ or ‘the land alongside a river’; its two meanings are not related.

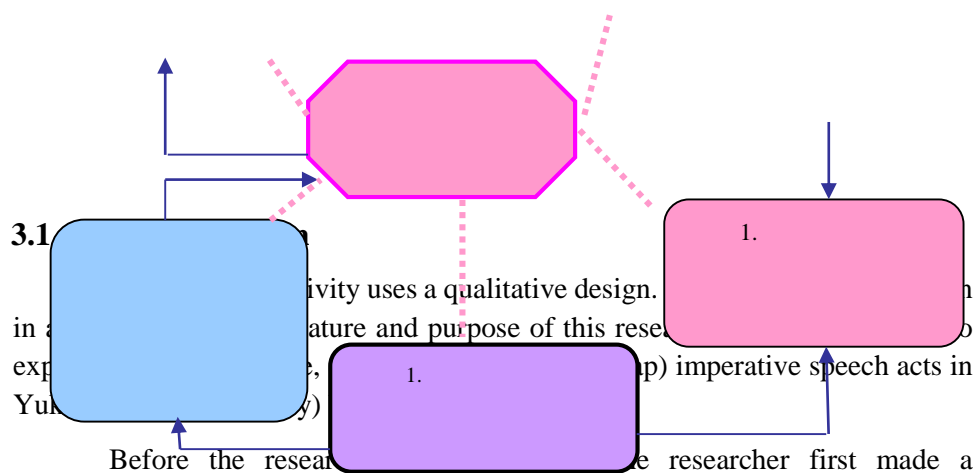
### 3. Research Method

The research method is part of a series of research activities that are very important and strategic. The stages described in the methods and approaches used in a study, starting from the determination of design, data collection, and data analysis will provide a concrete picture of the direction to be addressed and the type of results to be obtained. The following methods and techniques will be used as basic guidelines in conducting each stage in this research. The discussion of methods in this study includes (1) research design, (2) data and data sources, (3) data collection techniques and the role of researchers, (4) data analysis techniques and research reports.

The four aspects mentioned above are the basic steps that researchers will refer to in directing their designs so that they can be guided by real procedures. In general, a research design is related to data qualifications that lead to quantitative or qualitative traits. Data and data sources involve the object of analysis (data) and the source of data (data sources). The technique of collecting data involves procedural steps related to the role of the researcher and the technique of data collection in the field. While the data analysis technique is the final stage of research activities and making reports as the responsibility of all research procedures that are exceeded at the previous stages. Each stage is evaluated so that if a data inaccuracy is found and the analysis procedure is immediately known, a solution is found immediately through data checking, discussion with the counselor or other reference sources. These stages are mapped out correlational in the following diagram:

Descriptive Analysis qualitative research





3.1. This activity uses a qualitative design. The researcher first made a comprehensive plan, concerning the basic framework contained in the research design, preparation of instruments, steps for data collection, and analysis techniques. The basic design is used to answer problems that specifically become the main reference in the motion and follow-up action. In the process of data analysis, researchers depart from the field data and after going through the process, identification, codification, then the process of interpreting data (interpretation) is done, which is commonly referred to as inductive analysis. The next step is followed by conclusions using descriptive techniques and recommendations of various parties (comparative data, informants, experts) so that the results of the study obtain scientific validity (Moleong, 2005).

### 3.2. Data and Data Sources

The data in this study are the meaning of Sanji jukugo in Yukiguni (Snow Country) by Kawabata Yasunari. While the data source is in the form of novels Yukiguni (Snow Country) by Kawabata Yasunari, both original Japanese and Indonesian translations.

#### Data Analysis

The formation of Sanji jukugo (a combination of three kanji) in Snow Country by Kawabata Yasunari. 120 Sanji were found, which is (1) is arrange and mentions one by one the kanji characters, (2) are combination 1 character vocabulary with 2 character vocabulary

Table 1 *Sanji jukugo* in *Yukiguni (Snow Country)* by Kawabata Yasunari



No	<i>Sanji jukugo</i>	Reading	Meaning	Number of <i>Sanji jukugo</i>	1	2
1	信号所	<i>Shingōsho</i>	Signal stasiun	4		✓
2	立往生	<i>Tachiōjō</i>	Stuck	1	✓	
3	報知線	<i>Hōchisen</i>	Broadcast line	1		✓
4	不思議	<i>Fushigi</i>	Strange	14	✓	
5	三時間	<i>SanJikan</i>	three hours	1		✓
6	人差指	<i>Hitosashiyubi</i>	index finger	2	✓	
7	水蒸気	<i>Suijōki</i>	water vapor	1		✓
8	夕景色	<i>Yūgeshiki</i>	Evening scenery	12		✓
9	旅愁顔	<i>Ryoshūgao</i>	Face to face	1	✓	
10	三等車	<i>santōkuruma</i>	Third grade car	1		✓
11	非現実	<i>higenjitsu</i>	Unreal	5		✓
12	半時間	<i>hanjikan</i>	Half an hour	1		✓
13	機関車	<i>kikansha</i>	Locomotive	1		✓
14	火事場	<i>Kajiba</i>	Fire place	5		✓
15	雪装束	<i>Yukishōzoku</i>	Snow costume	1		✓
16	待合室	<i>machiaishitsu</i>	waiting room	4		✓
17	自動車	<i>jidōsha</i>	Automobile	6		✓
18	氷点下	<i>Hyōtenka</i>	Below freezing	1	✓	
19	七八尺	<i>nanahachishaku</i>	Seventy eight	1		✓
20	二三尺	<i>Nisanjaku</i>	Some three	1		✓
21	終列車	<i>shūressha</i>	Last train	1		✓
22	季節前	<i>Kisetsumae</i>	Before the season	1		✓
23	温泉宿	<i>onsenyado</i>	Hot spring hotel	2		✓
24	真面目	<i>Majime</i>	Serious	9	✓	
25	危険期	<i>kikenki</i>	Dangerous period	1		✓
26	温泉場	<i>onsenba</i>	Hot spring area	12		✓
27	三味線	<i>Shamisen</i>	Shamisen	18		✓
28	一時間	<i>Ichijikan</i>	one hour	5		✓
29	芸者風	<i>geishafū</i>	Geisha style	4		✓
30	無論裾	<i>muronsuso</i>	Argument	1		✓
31	不似合	<i>funiai</i>	Disagree	2		✓
32	日本踊	<i>Nihon odori</i>	Japanese dance	7		✓
33	一年半	<i>Ichinenhan</i>	One and a half years	1		✓
34	外素直	<i>gaisunao</i>	Sloppy	1		✓
35	歌舞伎	<i>Kabuki</i>	Kabuki	3	✓	
36	話相手	<i>Hanashiaite</i>	Talk partner	2		✓

37	一週間	<i>isshūkan</i>	one week	1		✓
38	湯道具	<i>yudōgu</i>	Pot	3		✓
39	旅行者	<i>ryokōsha</i>	Traveler	1		✓
40	避暑地	<i>hishochi</i>	Summer resort	1		✓
41	温泉村	<i>onsenmura</i>	Hot spring village	4		✓
42	西洋人	<i>sei'yōjin</i>	Westerner	1		✓
43	日本人	<i>nihonjin</i>	Japanese	1		✓
44	印刷物	<i>Insatsubutsu</i>	Printed matter	1		✓
45	舞踊家	<i>Buyō-ka</i>	Dancer	1		✓
46	彼自身	<i>kare jishin</i>	Himself	2		✓
47	真昼間	<i>mappiruma</i>	Midday	1		✓
48	保護色	<i>hogoshoku</i>	Protective color	1		✓
49	本能的	<i>hon'nōteki</i>	Instinctive	1		✓
50	湯治場	<i>tōji-ba</i>	Bathhouse	1		✓
51	料理屋	<i>ryōriya</i>	Restaurant	4		✓
52	主人達	<i>shujintachi</i>	Masters	1		✓
53	郵便局	<i>yūbinkyoku</i>	post office	1	✓	
54	宿屋中	<i>shukuyachū</i>	During the inn	1		✓
55	雜記帳	<i>zakkichō</i>	Notebook	2		✓
56	古新聞	<i>furushinbun</i>	old newspaper	1		✓
57	寢間着	<i>nemaki</i>	Sleepwear	2		✓
58	都会的	<i>tokaiteki</i>	Urban	1		✓
59	紙障子	<i>kamishōji</i>	Paper Shoji	1		✓
60	古毛糸	<i>ko keito</i>	Old wool yarn	1		✓
61	屋根裏	<i>Yaneura</i>	Attic	3		✓
62	裁縫箱	<i>saihōbako</i>	Sewing box	2		✓
63	座敷着	<i>zashikigi</i>	Sitting down	4		✓
64	腸結核	<i>chōkekkaku</i>	Intestinal Tuberculosis	1		✓
65	五十前	<i>Gojumae</i>	Fifty years ago	1		✓
66	木綿縞	<i>momenjima</i>	Cotton streaks	2	✓	
67	芸者衆	<i>geishashū</i>	Geisha crowd	1		✓
68	道德的	<i>dōtokuteki</i>	Moral	1		✓
69	古雑誌	<i>furuzasshi</i>	Old magazine	1		✓
70	療養費	<i>ryōyōhi</i>	Medical expenses	2		✓
71	稽古本	<i>keiko hon</i>	Lesson book	2	✓	
72	勸進帳	<i>kanshinchō</i>	Written note	2		✓
73	三曲目	<i>sankyokumoku</i>	Third song	1		✓
74	二十人	<i>nijūnin</i>	Twenty people	1		✓
75	五六十人	<i>gorokunin</i>	Fifty six	4		✓
76	籐椅子	<i>tōisu</i>	Rattan chair	2		✓

77	運転手	<i>untenshu</i>	Driver	3		✓
78	肉体的	<i>nikutaiteki</i>	Physical	1		✓
79	行商人	<i>gyōshōnin</i>	Hawker	1		✓
80	鉄道省	<i>tetsudōshō</i>	Ministry of Railways	1		✓
81	展覧会	<i>tenrankai</i>	Exhibition	1		✓
82	休憩所	<i>kyūkeijo</i>	Rest area	1		✓
83	注連縄	<i>Shimenawa</i>	sacred shrine rope	2		✓
84	幾種類	<i>ikushurui</i>	How many	2		✓
85	送別会	<i>sōbetsukai</i>	farewell party	1		✓
86	停車場	<i>Teishajou</i>	Bus stop	6		✓
87	六百本	<i>roppyakuhon</i>	Six hundred bottles	1		✓
88	水商売	<i>mizushōbai</i>	Water business	2		✓
89	可哀想	<i>kawaisō</i>	Poor	3	✓	
90	道楽者	<i>dōrakumono</i>	Entertainer	1		✓
91	駄菓子	<i>dagashi</i>	Candy	4		✓
92	開通前	<i>kaitsūzen</i>	Before opening	1		✓
93	旧温泉	<i>kyūonsen</i>	Old hot spring	1		✓
94	新温泉	<i>shinonsen</i>	Shinonsen	1		✓
95	感傷的	<i>kanshōteki</i>	Sentimental	1		✓
96	案内書	<i>an'nai-sho</i>	Guide	2		✓
97	急傾斜	<i>kyūkeisha</i>	Steep slope	1		✓
98	元禄袖	<i>genrokusode</i>	Yuan sleeve	1		✓
99	共同湯	<i>kyōdōyu</i>	Common hot water	2		✓
100	六座敷	<i>rokuzashiki</i>	Rokuzashiki	1		✓
101	四座敷	<i>shizashiki</i>	Four seater	1		✓
102	番頭達	<i>bantōtachi</i>	Our heads	1		✓
103	観楓客	<i>kanpūkyaku</i>	Visitor	1		✓
104	生意気	<i>namaiki</i>	Saucy	1	✓	
105	客座敷	<i>kyakuzashiki</i>	Guest room	1		✓
106	薄情者	<i>hakujōsha</i>	Lame	1		✓
107	二次会	<i>nijikai</i>	Second party	2		✓
108	感動的	<i>kandōteki</i>	Touching	1		✓
109	手鞠歌	<i>temariuta</i>	Hand song	1		✓
110	工芸品	<i>Kōgeihin</i>	Craft	1		✓
111	長逗留	<i>Chōtōryū</i>	Nagao Shiodome	1		✓
112	機業地	<i>kigyōchi</i>	Machine industry location	2		✓

113	大屋根	<i>Daiyane</i>	Large roof	1		✓
114	温泉町	<i>onsenchō</i>	Hot spring town	1		✓
115	料理屋	<i>ryōriya</i>	Restaurant	4		✓
116	丁字形	<i>teijikei</i>	Double letter	1		✓
117	明治前	<i>Meijimae</i>	Before Meiji	1		✓
118	地吹雪	<i>jifubuki</i>	Snowstorm	1		✓
119	子供達	<i>kodomotachi</i>	Children	2		✓
120	映写機	<i>Eishaki</i>	Projector	1		✓

Note:

Arrange and mentions one by one of the kanji characters.

Combination 1 character vocabulary with 2 character vocabulary.

In accordance with the formulation of the problem, the data analysis will be presented the formation of sanji jukugo and the semantic meaning of sanji jukugo in Yukiguni (Snow Country) by Kawabata Yasunari.

Context

When Shimamura went to the shop, he only paid attention to the woman and will consider her as an impression based girl after seeing her figure.

*Shimamura wa kanojo hitori dake o kirihanashite, sono sugata no kanji kara, jibun katte ni musume darou tokimeteiru dake no koto datta. Niwa Kare ga sono musume o Fushigi Na Mikata de Amari Ni Mitsumesugita Kekka. The mizukara no kanshou curry is not known as the kuwawatte no koto kamo shirenai.*

Analysis

Shimamura only paid attention to the woman and will consider her as an impression based girl after seeing her figure. That might be due to the sentimentality that was caused because he kept looking at the girl in a strange way.

Sanji jukugo (Combined three starch) in data 2 is 不思議 fushigi (strange). Unlike other Sanji jukugo cannot be separated.

Context

A man walked slowly on the snow while holding a lantern, wrapping his scarf over his nose and letting the skins of his hat hang over his ears. The man is Mr. Sep, head of the station. Yoko met with Pak Sep to ask about the condition of his younger brother who was working under the guidance of Pak Sep.

Yoko: 'Hon no Kodomo Desukara, Ekichou San Yoku Oshieteyatte Itadaite, Yoroshiku Onegai Itashimasuwa.' (Kawabata, 1969: 7).

Yoko: "He is still a child, so I beg you to guide him carefully. Please." (Rosidi, 1987: 20)

Speech on data 1 oshieteyatte itadaite onegai itashimasuwa, can be described as follows:

「教えて」 oshiete is te form verb derived from oshieru verb 'teaching, telling'.

Example:

*Koko made oshiete ageta kara, or no mondai wa jibun de kangaenasai.*

I taught up to here, for the next question please think for yourself.

*Ii janai desuka. Senpai, oshiete kudasaiyo.*

It is okay. Class sister, please let me know.

The speaker is spoken by a senior who teaches the younger sister the Japanese language class, which is how to read kanji. The classmates only taught part of how to read kanji letters, then the classmates were asked to think for themselves about how to read the next kanji letters. Oshieru is defined as teaching because what is conveyed is science, in this case, it is the way to read kanji.

*Chishiki, gijutsu nado o mi ni tsukeeruyouni saseru. Gakumon ya gijutsu nado o.*

which mean making someone have knowledge to do art and so on.

The speaker is said by the class to the senior class namely the younger sibling as the speaker asking the senior to tell the aspirations of childhood. But the elder brother was embarrassed to say it.

Oshieru was interpreted to mean because the classmate wanted to know the ideals of the younger siblings when he was a child. Like in Shogakan, the meaning of oshieru is telling someone about what they want to know. From the description above, oshieru can be interpreted as 'teaching' which is giving new information about science, and 'telling' someone about something they want to know.

Context

Shimamura, who had not met the head of the station for a long time, when meeting at the station greeted the station head with a polite greeting.

Ekichou san, watakushi desu. Gokigen yoroshuu gozaimasu.

Mr. Station, it's me. How are you?

The Sanji jukugo used by Shimamura is Gokigen How are you? Gokigen consists of two words namely go and kigen. The go function is a description of polite language because what Shimamura faced was station chief. Another example of go as a polite form is han being gohan (rice), kazoku being gokazoku (family), and so on.

#### Context

When Shimamura went to the shop, he only paid attention to the woman and will consider her as an impression based girl after seeing her figure.

Shimamura wa kanojo hitori dake o kirihanashite, sono sugata no kanji kara, jibun katte ni musume darou tokimeteiru dake no koto datta. Niwa Kare afternoon demo no Sono Musume O Fushigi Na Mikata de Amari Ni Mitsumesugita Kekka. The mizukara no kanshou curry is not known as the kuwawatte no koto kamo shirenai.

Shimamura only paid attention to the woman and will consider her as an impression based girl after seeing her figure. That might be due to the sentimentality that was caused because he kept looking at the girl in a strange way.

「ただいて」 itadaite is a te-form verb derived from the verb I am` given, received'. 「よろしく」 yoroshiku is a greeting that is often used to ask for help which means 'thank you in advance'. 「お願い」 onegai is a noun-verb derived from the negau verb `please'. The prefix o on onegai is a sign of the form of courtesy and this utterance is often used in everyday conversation when going to ask someone for help. 「いたします」 itashimasu is a polite verb form of Shimasu. Itashimasu in Onegai Itashimasu's speech is a form of o + masu + verb + itashimasu. In everyday life, the utterances commonly used when someone asks for help are onegai shimasu. It can be said that Onegai's speech sashimasu was more polite than onegai shimasu and onegai.

「わ」 wa is a particle at the end of a sentence that is only used by women. According to Chino (2004: 120-136) wa as a particle at the end of a sentence, it is used by women to express admiration and slow the sound in a statement. Like Yoko as a woman speaker, using particles at the end of the sentence, she asked the head of the station to guide her sister well.

An existence that distinguishes sex between men and women is a characteristic of Japanese (Jordan, 1999: 250). Meanwhile, according to Horii (2000: 23) in general, the way women talk is very gentle, polite. Indeed there are female speakers, especially Japanese teenagers using the male language. Without hesitation, female speakers use the language commonly used by men such as wearing particles that

are only used by men. But the use of such languages is only as which is the language used by very close friends. Very surprising, in the era of the 1970s and 1980s Japanese women also used male language. Japanese people explain these symptoms in various ways, including those that might be caused by the following:

Japanese women feel happy to ignore the rules of using respectful language.

1. Their parents do not teach the use of language properly.
2. They unconsciously want to be men.
3. The motivation to get along with boys as playmates and on the other hand the boys themselves do not show an attitude of refining the harsh language.

Based on the explanation above, it can be seen that the use of the Japanese can show the femininity and masculinity of speakers. The meaning of the utterance of data 1 above is irai which is the demand sentence because it is characterized by a polite imperative form, namely the use of utterances oshieteyatte itadaite. Itadaite is an imperative marker of the polite form of te form derived from the verb itadaku, and the verb itadaku is a polite form of morphic verbs. In other words, the utterance of osieteyatte itadaite feels more polite when spoken by osieteyatte moratte.

According to Iwazaki, demand is an expression of the speaker to ask the opponent to speak to act according to the request of the speaker. But in the request, there is a choice against saying not to carry out the speaker's request. In this case, Pak Sep, as opposed to saying, could not have done what Yoko asked, namely Pak Sep did not guide Yoko's sister.

#### Context

The head of the station, wearing a coat over his kimono, wanted to quickly end the conversation while standing in the cold, turning his back to Yoko and wanting to leave. But Yoko immediately went to the head of the station and asked the head of the station to guide his sister.

Yoko : `Ekichou san, otouto wa ima dete orimasen no?` to Yoko wa yuki no ue o mesagashi shite, `Ekichou san, otouto o yoku miteyatte, onegai desu` (Kawabata,1969:8)

Yoko: "Sir, now my sister is not on duty?" Yoko said while looking at the snow. "Sir, I beg that you guide my younger brother well."

Mite yatte `please look at 'has a lexical meaning, which is doing viewing activities. Yoko asked the head of the station to look at his younger brother who was working under the guidance of the station head. While the utterances of mite yatte onegai

desu `I request that you guide my younger brother well 'have lexical meaning, namely please do it.

#### **4. Conclusion**

From the analysis that has been done, it can be concluded that not all Sanji Jukugo (Combined Three Kanji) can be separated because there is also a vocabulary consisting of Sanji Jukugo (Combined Three Kanji). Example 不思議 fushigi "strange". On the contrary, if the word is separated, it will have no meaning. The most used Sanji Jukugo by Kawabata Yasunari is 14 times by using Fushigi because the author feels strange in Snow Country. From 120 data collected, almost all Sanji Jukugo is a combination of 1 character vocabulary with 2 character vocabulary. The use of the Japanese can show the femininity and masculinity of the speaker because in Japanese there are female language and male language.

#### **Acknowledgements**

We would like to thank anonymous reviewers for comments on our earlier version of this article.

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## Chapter 9

### **The Exemplary Principal Leadership In Transforming Regular Public School Into An Inclusive Pioneer School**

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**Abstract** - This research aimed to explore leadership practices of exemplary principal in transforming regular public high school into an 'inclusive pioneer' public high school. Through the act of leadership practices, the school was acknowledged by local and international parties as one of the successful inclusive public high school in Indonesia. This could be one of the reasons the principal was granted an award as the Best Principal 2019 in the province. This research used a qualitative approach within a case study design. The data collection techniques used in this research were interviews and observations. We interviewed the Principal of SMPN 28 as the pioneer in inclusive education in Surabaya. We also interviewed Head of Education in Surabaya, vice principal, teachers, parents and also the students.

**Key words:** Leadership, Inclusive School

#### **1. Introduction**

Although inclusive education has been agreed and implemented in many countries almost three decades ago, the implementation of inclusive education for children with special need in Indonesia has just begun two decades later. According to Poernomo (2016) as a commitment of the Indonesian government, the implementation of inclusive education for the disabled started in 2002 when the government officially started pilot projects in nine provinces which have resource centers, and since then, there are more than 1500 students with disabilities were enrolled in mainstream schools. In 2005 the number increased to 6,000 students or 5.11% of the total number of children with special needs. Whereas in 2007 increased to 7.5% or 15181 students in 796 inclusive schools which consists of 17 kindergartens, 648 primary schools, 75 secondary schools and 56 senior high schools. Moreover, to encourage the implementation of inclusive education more broadly, a national workshop was held in Bandung that produced Bandung

Declaration in which the content was among others encourage the government, educational institutions, relevant institutions, business and industry and the community to ensure any children with disabilities to get equal access to all aspects of life, as well as getting humane treatment (Poernomo, 2016).

When tracking back the history, the notion of education for individuals with special needs actually has been embedded far before Indonesia received its independence day in 1945. As stated by Sunardi, Gunarhadi & Yeager (2011) in 1901, Pioneer Ch. A. Westhoff opened a sheltered workshop for the blind in Bandung. Also in Bandung in 1927, a school for the mentally retarded was opened by Vereniging Bijzonder Onderwijs, promoted by Folker, so that the school became known as the Folker School. The first school for the deaf-mute was initiated in Bandung in 1930 by C. M. Roelfsema. After Indonesia's independence, a few special schools were established in other regions, mostly managed by private foundations, consisting of special school types for the blind, the deaf-mute, the mentally retarded, the physically handicapped, and the emotionally disturbed. Furthermore, the National motto of „Bhinneka Tunggal Ika“ (unity in diversity) represents a national confession to stay united in spite of significant social, multiethnic diverse state and geographical challenges (Sheehy & Budiyanto, 2015).

In terms of legal matters, constitution of the Republic of Indonesia 1945 stated clearly and unequivocally guarantee that every Indonesian citizen has the right to education, which was emphasized by the Direction Letter of the Directorate General of Primary and Secondary Education No. 38/C.66/MN/2003, dated 20 January 2003 on National Education System about Special Education in Regular Schools. This Direction Letter stated that every district must operate at least four inclusive schools, one primary, secondary, general high and vocational higher type. By 2008, there were 925 inclusive schools existed in Indonesia. The inclusive policy then received strong legal support by the Decree of the Minister of Education No 70-2009 concerning inclusive Education for Students with Disabilities and with Special Talents. It stated that every district must operate at least one inclusive high school and every sub district must operate at least one primary and one secondary inclusive school. This inclusive education are for students with potential intelligence and/or other special talent (Sunardi, Gunarhadi & Yeager, 2011)

In Surabaya, the second biggest city in Indonesia, where we conducted the research, the inclusive education in public school itself has been initiated since 2014 by two regular high school among 62 public schools in the city. Then, it became 2 schools in 2015, and 5 schools in 2019. Although the number of inclusive

schools has continued to growth, it is a gradually growth rather than significant. Unlike the previous Indonesian government initiative when committing to give all Indonesian children at least nine years of basic education (Ramos-Mattoussi & Milligan, 2013) which relatively more successful in achieving the enrolment targets compare to other East Asian countries (Sheeby & Budiyanto, 2015), the implementation of inclusive education has not been running smoothly. The data from UNESCO shown that the ranking continue to decline. In 2008, Indonesia was in the 63rd rank and in 2009 was in the 71st and continue declining. In fact, the school enrollment rate is still low, only 34,2% (Poernomo, 2016).

In fact, the goal of inclusive education in all school is not easy to achieve. One obvious obstacle is due to teacher's negative attitude towards the acceptance of inclusive education. A relevant study measuring teacher's perception towards the implementation of inclusive education in all public high schools in Surabaya revealed that not all teachers could accept the establishment of inclusive education and teachers are lacking of understanding (Suryani, 2014). Studies conducted by Boucher (1981) and Rizzo (1984) have generally found that the overall attitude of general education teachers tends to be negative towards the inclusion of students with disabilities (Ingram, 1996). Inclusive education represents a major change for most school organizations. Teachers may feel resentful for having to bear extra responsibility, pressured by additional demands on strained workloads, and incompetent owing to lack of training and preparation for the task (Ingram, 1996). In spite of this, Bass (1985) stated that leadership behavior of the principal influences teacher motivation towards goal expectation, and the successful implementation of innovation and change in schools is related to leadership behavior of the principal (Ingram, 1996). It is logical, then, to assume that the leadership practice of the principal may influence the way in which inclusive education is accepted and implemented not only by teachers, but also the whole school organization.

In addition to this, an analysis of reality shows of „zoning system“ related to the acceptance of students enrollment in Indonesian state high school nowadays reveal several assumptions (1) heterogeneous input occurs in favorite and non-favorite state schools (2) there will be many students with special needs found in schools with high input and have homogeneous characters (3) there will be teacher unpreparedness in serving the teaching and learning process with heterogeneous students (4) there will be unpreparedness of school principals who have been managing favorite schools or homogenous student character previously (5) an insightful mindset and skills for inclusive education services are needed by paying attention to the baseline of new students at all level in school (principals, teachers

and all school members). The current reality suggest the challenge faced by school principals to immediately acquire new skill in managing diversity, or in other word, inclusive education. In the new environment, the conservative school's notion of applying one general approach to all students soon will not be applicable anymore. As stated by Richi (2000) the idea of all students should be accultured into a single ways of knowing or behaving is under challenged. Under new environment, schools are for all children. As mentioned by Richi (2000) that serious attention should be taken to promote and acknowledge all students, whatever their personal characteristics or social backgrounds are. All can succeed in school. In this study, the leadership roles of principal in respond to diversity and establishing inclusive education in school will be explored. Begin with its leadership role in fostering new vission about inclusion, promoting inclusive practices within school and building connection between school and community.

Research questions

1. How are the leadership practice of the principal in building the inclusive educational system at school?
2. What are the principal's set of actions in building the inclusive educational system at school?

## **2. Conceptual Thinking**

### **The Role of School Administrators in Responding to the Needs of Diverse Students**

Principals occupy positions that carry unique responsibilities and opportunities, and they work within a particular tradition of practice with its own strengths and weaknesses. Probing the role of the building level administrator with regard to student diversity is not meant to isolate that role from others in the social and political fabric of the school, nor to overstate the importance of the formal school leader, but instead to help clarify the contributions of those who hold a well-established position and to suggest ways in which their work can be more effective.

One of the central tenets of organizational theory is that tasks are primary elements around which organizational structures and cultures can be effectively designed. Similarly, tasks are foundational for understanding the work of individuals. Three broad classes of tasks face educational administrators as they respond to diversity; principals' approaches to these tasks determine the degree to which their practice can be characterized as inclusive and transformative. The task categories are fostering new meaning about diversity, promoting inclusive practices within schools, and building connections between schools and communities. demonstrated that school reform will not take hold unless broad constituencies, including students, parents, and the general public, as well as

educational professionals themselves, both understand and invest in the changes (Metz, 1990b; Tyack & Cuban, 1995). In this regard, the role of the school principal is crucial. Although meanings are negotiated socially, that is, through a shared process, leaders typically have additional power in defining situations and their meanings (Miron, 1997). In schools, administrators are often in a better position than others to influence what things mean. Anderson (1990) describes three strategies by which principals influence meaning-making: through the day-to-day management of meanings among organizational stakeholders, through the mediation of conflict when open contention arises, and through the cognitive task of resolving contradictions within their own ideological perspectives. Since meanings are encapsulated in organizational structures and routines, administrators can help change meanings by changing the routine ways in which things are done and how the school organization is designed (Meyer, 1984). Principals are key agents in framing those new meanings. Fostering new understanding and beliefs about diversity and inclusive practice involves more than simply communicating particular understandings so that they become diffused through an educational context. Groups and individuals are thus not simply the recipients of new meanings, but their co-creators. A key strategy available to school principals for accomplishing this is

Fostering new meaning about diversity. Much of the literature on school reform both emanates from and is directed toward professional and technical processes internal to schools, particularly around the central activities of teaching and learning. New (or renewed) instructional methods, new organizational configurations, new forms of assessment and accountability, and new norms of teacher practice that emphasize collaboration and professional growth are examples of reform initiatives that address fundamental structures and processes within schools. However, numerous analyses of educational change have the promotion of democratic discourse within the school community. Rollow and Bryk (1993) claim that schools that serve all students well are “marked by sustained debate over the key ideas that vie for moral authority and what these ideas mean in terms of specific school improvement plans” (p. 102).

Promoting inclusive practices within school. This task centers around two dimensions: promoting forms of teaching and learning that enable diverse students to succeed and molding school cultures that embrace and support diversity. Administrators can act in direct ways to impact the school culture but their role with regard to inclusive instructional practice is more indirect. Research on instructional leadership, however, rarely explores issues of student diversity and learning explicitly. Thus, knowledge about how leaders promote inclusive

instructional practices in schools must often be inferred from broader work. The activities of practices included of promoting inclusive teaching and learning and molding inclusive school cultures.

Building connections between school and communities. This task is based on understandings of the embeddedness of schools, both within the neighborhoods and communities in which they are located and within the network of organizations and institutions through which students move. This task has two prongs: mobilizing schools within processes of community development and working with other organizations to deliver coordinated services to children. Refer to Berger and Neuhaus (1977) concept of mediating institutions, which they defined as “people-sized” institutions that stand between individuals and larger social institutions and organizations. Sometimes schools are considered to be mediating institutions, working on a slightly larger scale than the family to socialize individuals into broader social processes. Other theorist posit that schools themselves are one of society’s dominant institutions and that students interact most effectively with schools when that interaction is mediated by other institutions such as advocacy groups or parent associations. It is already apparent that if school administrators consider service coordination to be a part of inclusive administrative practice, they must focus on issues of implementation as well as outcomes , they must articulate coordinated services as an integral part of the mission of the school, and they must work to change school accountability systems to reflect these new relationships and obligations.

### **Principals as an Agents of Inclusive Education**

The formal leaders of schools can possibly have an affirmative role in creating schools that are more inclusive and that serve diverse students more effectively (Tyack, 1974). Most social movements are not predicated on the expectation that the formal heads of established organization will routinely be the agents of change, although exceptions do occur. One of the assumptions embedded in the scholarly literature on school administration and diversity written from a critical theory perspective is that a genuine commitment to diversity would require administrators to attend to the fundamental inequities in schooling, to disavow the institutions which they purportedly lead, and to work toward larger projects of social and institutional transformation. This perspective portray the practicing administrators as conservative. Rizvi (1993) argues that schooling is inherently a conservative context in which racism, classism, and sexism are present but subsumed under a fiction of tolerance between social groups and a myth of neutrality about administrative work. Administrators are subject to the same kind



of hidden curriculum about discipline and control that teachers and students experience. McNeil's (1986) study of the hierarchies of behavioral control established by principals and enacted by teachers through their curricula and teaching methods. Her research based on the thinking that when education is governed by an "accountability system," public language or languages are displaced by an expert technical language. When educational practice and policy are subsumed under a narrow set of indicators, then the only vocabulary for discussing those practices and policies is the vocabulary of the indicators. She believe that the tension between the controlling goals and the educational goals in schools is happen. The tendency of teachers, where controlling goals over-whelm the educational purposes, to accommodate to controls by teaching an artificial "school knowledge" in order to gain compliance from their students is reviewed. Britzman's (1991) study of the student teachers who experienced administrative pressures to adjust to the way things are and protect the status quo in schooling. She unfolds a captivating narrative of two student teachers, Jamie Owl and Jack August, and differ in two fundamental points. First, the use of critical theory as an "empowering" tool that gives the reader the impression that becoming a teacher is a process that can be eventually delineated and understood with unitary precision. Hence, she develop an analysis of critical theory that questions Britzman's suggestions for effecting change in teacher education programs. In the second part of this essay, sh suggest that Britzman's choice to observe and report only the unsuccessful experiences of the student teachers raises some research methodology concerns. She argue that, in the complex world of the classroom, it is hard to believe that student teachers did not fulfill their own agenda at least once. The narratives of student teachers could not possibly just be strings of unsuccessful experiences and broken dreams. Finally, Britzman's possible influence on the students' conceptions and plans of actions is not documented, which leaves the reader with an "incomplete" canvas of Jack's and Jamie's lived experiences. Some scholars (e.g., Foster, 1986; Parker & Shapiro, 1993) suggest that administrators who do become committed to social change will experience conflict as they are expected to maintain institutions which they no longer see as legitimate.

Pessimism about administrators as agents of change also predominates in less radical inquiries into administrative practice. Wolcott (1973) concluded that although principals are often looked to as agents of change, they tend to monitor the continuity of both institutions and society. The others found that organizational conditions often mitigate against administrators' ability to innovate. Given their roles, preparation, and traditions, as well as the contexts in which they serve, administrators are not fundamentally oriented toward change (Fullan, 1991; Sarason, 1996). Administrators are steeped in a structural functionalist perspective

that tends to view the existing social order as legitimate, that espouses the values of democracy and meritocracy, and that adopts a managerial orientation instead of a socially transformative one. Administrators do not willingly admit publicly to problems along the dimensions of race, class, or gender in their schools, even when they privately acknowledge their existence.

### **The Leadership Behavior of the Principals for Inclusive School**

Leadership can be dispersed across many persons and roles in educational contexts, and indeed is usually more effective as a distributed practice (Barth 1990) – focus here on the school principal. Inclusion of moderate and severely disabled students, a slow, but growing phenomenon, represents a major change for most school communities. Studies have shown that the successful implementation of innovation and change in schools is related to leadership behavior of the principal (Bowers, 1990). It is logical, then, to assume that the leadership behavior of the principal may influence the way in which inclusion is accepted and implemented by teachers.

The efforts to rejoin disabled students with non-disabled students in the same classrooms has raised several important and sensitive issues. Aside from the issues of acceptance by peers and their parents, adaptability of the curriculum and instructional methodologies, and teacher attitudes, both positive and negative, the role of the principal in inclusion efforts warrants particular consideration. The leadership behavior of the principal is viewed as a pivotal role in promoting effective acceptance and implementation of school wide change (Hall and Hord, 1987).

Effective inclusion of students with moderate and severe disabilities in regular classrooms is likely to be a very challenging undertaking (Stainback and Stainback, 1992) and therefore may require, among other things, extraordinary efforts on the part of regular education teachers. In support of this likely need of extra teacher effort, principals as a leaders play an influential role in motivating teachers to succeed in the inclusion of disabled students in regular classrooms. The leadership behavior of the principal influences teacher motivation towards goal expectation (Bass, 1985).

Transformational leadership. Burns (1978) proposed a new theory of leadership, transformational leadership. Transformational leadership has been shown to have a greater impact on change in attitudes of subordinates. Leithwood (1992) found relationships between aspects of transformational leadership and teachers' reports of changes in both attitudes towards school improvement and altered instructional behavior. While suggesting a need to add moral authority to

bureaucratic systems, Sergiovanni (1991) implies that a set of shared values and beliefs that spell out who teachers are, what they want to accomplish and how, will increase teacher motivation and commitment to effective teaching and learning. Transformational leaders, according to Burns (1978), raise followers' consciousness levels about the importance and value of shared goals and how to achieve them. Transformational leaders motivate followers to transcend their own self-interests for the vision of the organization. Transformational leaders motivate by tapping higher order needs of followers. Bass and Avolio (1990) suggest that transformational leaders inspire followers with a vision of what can be accomplished through extra personal effort, thus motivating followers to achieve more than they thought they would achieve. Bennis and Nanus (1985), found that transformational leaders empower followers thereby helping them to develop competence necessary to achieve organizational goals. Tichy and Devanna (1986) studied the process by which transformational leaders move large organizations through major change. They found that transformational leaders move through three phases in the process of transforming the organization. First, the transformational leader recognizes the need for change and persuades key people in the organization of the seriousness of the need. Second, the leader involves key people in the development of an inspiring vision of the future. Finally, the leader mobilizes commitment to the new vision.

The efficacy of achieving changes and meeting new challenges which provide equal educational opportunity for all students is dependent, in large part, on the principal's leadership and ability to influence teacher motivation. The practice of transformational leadership is more effective than transactional leadership in inclusive schools. (Ingram, 1996). The transformational principal is more concerned with the development of shared values and beliefs, meanings, and commitment to common goals. The inclusion of moderately and severely disabled students represents a major change for the vast majority of staff in regular education settings. The successful implementation of inclusion programmes may require a change in the very culture of the school. In inclusive schools, it is critical that the principal identify and articulate a philosophy, a vision, that reflects the belief that all children can learn, that all children have the right to be educated with their peers in age-appropriate regular education classrooms, and that meeting the educational needs of all children is the responsibility of the school system and staff.

### **3. Methodology**

#### **3.1. Research design**

The researcher used the explanatory approach method in conducting qualitative research. This is in line with the explanation from Yin (2011) that case study research is appropriate to be used in explanatory research, since the research intended to explore the explanation of causality and the processes contained in the object of the study. The qualitative approach itself in Zikmund (2003) is used to explain and confirm the nature problem. The size of the depth of the study is not negative but an explanation with words. The researcher uses himself as a research tool.

This research was conducted using a case study method. Case studies are research strategies that answer the question "how (how)" or "why (why)" are proposed, researchers do not get full control of events, and the focus of research on contemporary phenomena that occur (Yin, 2003). Some literature refers to Yin (2011) as a reference in carrying out case study methods and doing so for the same reason Yin (2003), Eisenhardt and Graebner (2007) even expressed the opinion that the findings in case studies can develop theories.

Single-case studies are used as research experiments used to discuss current topics. Still in Yin (2003), the purpose of case studies is basically for analytical generalizations (first-level inference) that is case study findings will have implications for policy and theory development.

#### **3.2. Types and Data Sources**

##### **(1) Primary Data**

Sekaran (2006) explains primary data is data obtained directly from the first source, such as data obtained from individuals directly on the field through interviews and observations. It involves the latest and previous recordings, or public or private recordings, which can consist of writing, publications, sound recordings, photographs, or video recordings (Chooper and Schindler, 2011).

##### **(2) Secondary Data**

Chooper and Schindler (2011) explain that secondary data is material made by parties other than researchers and has specific objectives. Materials in the form of company data archives can be explored by researchers as research objects. Documents or publications are the second source of secondary data made by outside parties other than the object of research. The form is in the form of news or web pages. Still from the explanation of Chooper and Schindler (2011),

secondary data can help researchers determine what needs to be done and become a source that is rich in hypotheses but requires high creativity in the search process.

### **3.3. Procedure for Data Collection**

#### **(1) Archival Records**

In this study the data collection method used consisted of a study of literature, namely collecting materials in accordance with the topic of this research, this step is also known as an archival record. The material collected from the literature and statistics then converges as an object to be observed by researchers using an in-depth interview approach. The results of the interviews were recorded, then written as words in the interview transcript. It is through this transcript that the results can be used as material for research discussion.

#### **(2) Individual Depth Interview**

A more detailed discussion of indepth interviews is explained by Chooper and Schindler (2011), Individual depth interviews are interactions between an interviewer and a single participant on an interesting issue or topic and uses a connected method. In-depth interview procedures are carried out by direct meeting with the speaker for 40 minutes to 60 minutes. After first sending permission to study and attach interview guidelines, they were also followed up by phone. 3.

#### **(3) Sampling**

The researcher used purposive sampling, then chose judgment sampling because the sample was chosen by the researcher based on the assessment that the informant was the most appropriate party from very few people to be used as research samples and could provide the information sought (Sekaran and Bougie, 2009). In line with that, Zikmund (2003) explains that it uses purposive sampling, that has unique characteristics related to experience, attitudes, or perceptions as concepts or theoretical categories as a result of participants during the interview process.

The main data collection is from DR. Triworo Parnoningrum M. Pd. as the Headmaster of SMPN 28 Surabaya, She was chosen for her achievement as the Best Principal in Surabaya on February 2019. She is the pioneer of Inclusive School in Surabaya.

We also interviewed Head of Education in Surabaya, vice principal, teachers, parents and also the students.

#### (4) Triangulation

Flick et al (2004) explain that triangulation is important and unique in using procedures that are combined to equalize values. Triangulation in this study applies the method of Shah and Corley (2006), which is used to test validity by triangulating the data type and type of methodology. The next step carried out by the researcher is the analysis carried out on the results of data collection using data using explanatory building.

#### **3.4. Data Analysis Techniques**

Yin (2003) explained that the selected case could be evidence of the theory being developed. Case study in this type, the number of analysis units used in general is only one.

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## Chapter 10

### **Critical Areas Of Knowledge Loss When Election Of Members The Regency/Municipal House Of Representatives (DPRD) In Indonesia**

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**Abstract** - The purpose of this paper is to investigate the critical types of knowledge lost when election of members the regency/municipal house of representatives (DPRD) in Indonesia. The research is based on an integrated approach of literature search, content analysis and the results of a qualitative methodology in depth interviews involving 17 participants from legislators, council secretariat, government official, consultant, constituent, civil society activist, political party and journalist to gain an in-depth insight into the research question. And for conducting the research, data were gathered from selected five districts in East Java province, Indonesia. When the legislative elections which is held every five years in Indonesian, causing the replacement of some member of the regency/municipal house of representatives (DPRD) who has been working for 10 or 15 years might have a varied skills, knowledge, and expertise will also loss. The substitutions of legislators possess valuable types of knowledge depending on the role and positions they have performed. Four concepts of valuable knowledge have emerged from the interviews, these including first, tasks and authorities knowledge (know how), second relational knowledge (know with), third organisational knowledge (know about), fourth, good and clean governance knowledge (know why). The study might only be applicable to the local legislative councils sector. This paper fulfills an identification of critical areas of knowledge loss in Indonesian local people's representative councils and adds to the existing body of literature in the knowledge management literature.

**Keywords :** Knowledge, Loss Critical Areas, Local Legislative Councils

## 1. Introduction

In the past decade many researchers have argued that knowledge management is not only refers in private companies, but also in government organizations (public sector) [10][11] and plays an important role in helping to improve government organizations performance and enhances organizational effectiveness because it can encourage the use of existing knowledge (knowledge reuse) to improve the quality of decision making processes [14]. And according to the organizational structure of government, the regency/municipal house of representatives (DPRD) is a local people's representative institution that is an element of local government [12]. And related with research focus areas on particular issues parliament, several researcher have explored or assessment of the information needs of member of parliament are related to legislative and policy-making duties. It was found that policy makers have little access to relevant and reliable information when making decisions about policies, programs and policy implementation. Therefore decisions are often made based on what can be remembered [02]. And an assessment of the information needs and information seeking behaviour of members of parliament findings that seeking information was to make hearings requests, to make speeches, and to make decisions [01][02].

And according to GOI (Government Of Indonesia), The Law Of Local Government, No. 23/2014, where every 5 years a legislative election is held which causes the replacement of most of the members the regency/municipal house of representatives (DPRD). And the result of election of members the regency/municipal house of representatives (DPRD) 2019 in five districts in east java province Indonesia have shown that 49% is the new legislator.

No	Regions	Seats Contested	Incumbent Legislators	New Legislators
1	Municipality Of Madiun	30	11 (37%)	19 (63%)
2	Regency Of Madiun	45	26 (58%)	19 (42%)
3	Regency Of Magetan	45	16 (36%)	29 (64%)
4	Regency Of Ngawi	45	26 (58%)	19 (42%)
5	Regency Of Ponorogo	45	29 (64%)	16 (36%)
		210	108 (51%)	102 (49%)

An member of parliament who has been working for 10 or 15 years might have a varied knowledge, and expertise. And in order to retain the vast amount of

skill, expertise and knowledge on know how, know with, know about and know why, is to be an urgency to mapping it. Thus, qualitative methodology based on an integrated approach of literature search, content analysis and the results of depth interviews aims to address this research gap by addressing the following research question is “ what kind are the critical types of knowledge lost when election of members the regency/municipal house of representatives (DPRD)”. And for conducting the research, data were gathered from selected five districts in East Java province, Indonesia.

## **2. Literature Review**

### **2.1 Knowledge Management As A Strategic Asset In Local Government**

In the resources based theory, an organization's internal resources can explain sustainability of competitive advantage (SCA), where organizations need to have and control resources and capabilities that are valuable, rare, inimitable, and not imitated, and non substitutable [04]. The organization's knowledge will determine its performance and ability to maintain its competitive advantage [05][06]. By emphasizing the important role of organizations in integrating the knowledge possessed by members of the organization through appropriate coordination mechanisms [07]. Knowledge management is a process in an organization, by utilizing information technology to obtain, create, disclose, and provide knowledge for organizations to achieve their strategic goals. Therefore, knowledge can be considered as the most important strategic resource, to build and maintain competitive advantage [08]. Among the benefits of knowledge management are increased government competence, improved quality of government services [09]. Public organizations need to create favorable culture, system, environment and organization structures to gain benefits of implementation and other aspects of knowledge management [10]. Where knowledge was put into prime focus in developing public management and the quality of the data must be guaranteed to bringing a greater transparency, accountability, and all government activities or public services [11].

### **2.2 Challenges Of Knowledge Management In Local Legislative Councils**

The regency/municipal house of representatives (DPRD) has a key role in creating a democratic local government. The regency/municipal house of representatives (DPRD) is a formal institution that represents community interests and has the authority to transform community interests into policy. That role is carried out by articulating community input and then

transforming it into policy form. Therefore The regency/municipal house of representatives (DPRD) must respond to community needs when carrying out its functions in legislation, budget and supervision [13]. Various problems faced by the regency/municipal house of representatives (DPRD) are weak of support for providing data and information becomes an obstacle in making general policy, The occurrence of alliances from local government administration activities resulting in their lack of knowledge toward day to day administration carried out by local government bureaucracy, and the lack understanding of some members (tend to be the majority) towards various planning and budgeting processes [12]. Lack of capacity of budget literacy, budget analysis, budget oversight as well as local planning and budgeting policy advocacy [14]. The crucial thing to an organization is that if knowledge that is not captured, understood and transferred is useless, therefore the regency/municipal house of representatives (DPRD) must be to manage the knowledge of its members [15].

There are five concepts of valuable knowledge that will be lost when seniors or employees who have had long times of services in an organization. The first is knowledge or expertise regarding basic tasks and authority, the second is knowledge of business processes, the third is knowledge challenge organizational memory, the fourth is knowledge of business processes and the fifth is knowledge of decision making processes [16]. The results of the investigation show that the driving force and impact of knowledge loss from an organization is indicates a decrease in organizational capacity and performance and in order to overcoming it an organization must improve its architecture of knowledge and develop coordination strategies and mitigate knowledge loss [17]. With the critical area of knowledge loss being technical knowledge, contextual knowledge, business process knowledge, therefore without the correct process of utilizing and reusing organizational knowledge, the cycle of knowledge storage becomes incomplete and leads to loss of knowledge and resulted in many impacts and improved management of knowledge mitigation [18]. While knowledge retention strategies in public organizations are codification, training, education, workshops, seminars, mentoring and internships. On the other hand organizational structure, political situation and geographical location have a significant relationship with knowledge retention [19]. And it is a barrier to knowledge retention that only focuses on senior workers and on explicit and commodified knowledge, and without the correct process of reusing organizational knowledge, the cycle of storing knowledge becomes incomplete and leads to loss of knowledge [20].

### 3. Methodology

The research is based on an integrated approach of literature search, content analysis and the results of a qualitative methodology in depth interviews involving 17 participants from legislators, council secretariat, government official, consultant, constituent, civil society activist, political party and journalist to gain an in-depth insight into the research question. And for conducting the research, data were gathered from selected five districts in East Java province, Indonesia.

No	Interviewee	Role Or Interaction	Years Of Experience
1	Legislator	Budgeting	15
2	Legislator	Legislation	15
3	Constituent	Stakeholder	5
4	Consultant	Technical Assistance	10
5	Legislator	Oversight	10
6	Consultant	Technical Assistance	15
7	Council Secretariat	Administration	5
8	Civil Society Activist	Advocacy	12
9	Government Official	Counterparts	8
10	Journalist	Monitoring	10
11	Political Party	Representation	12
12	Civil Society Activist	Partnership	8
13	Legislator	Budgeting	10
14	Legislator	Legislation	10
15	Constituent	Stakeholder	4
16	Government Official	Counterparts	6

### 4. Discussions And Findings

It is important to involve many participants with different experience and expertise backgrounds to gain an lessons learned and in depth insight into the research question. Because the regency/municipal house of representatives (DPRD) are complex institutions. They consist of factions, commissions, steering committee, legislation committee, budget committee and ethics committee. And in order to be able to identify valuable types of knowledge and expertise, it is necessary to mapping relationships and roles with relevant parties. and based on the results of interviews and observations in the field, it can be grouped as follows, municipality or district head (oversight, policy and regulation, strategic planning), council secretariat (administration, facilitation, data and information), political party (representation, political agenda, conflict resolution), media or journalist

(socialization, oversight, advocacy), consultant or expert group (knowledge, capacity building, decision making), civil society activist (advocacy, partnership, engagement), citizen or constituent (participation, complaint handling, aspiration) and local government counterpart (budgeting, legislation, oversight). And based on the patterns and forms of relationships, the skills, expertise and valuable knowledge can be classified as follows, (know how) tasks and authorities knowledge such as planning and budgeting, legal drafting including to harmonize, finalization and consolidation of conceptual bills, public services oversight and citizen complaints handling, including supervise the implementation of laws, local budget, and ancillary regulations; deliberate and follow up on the result of audits conducted by the supreme audit agency (know with) relational knowledge, such as knowledge about political agenda, social networks and business relationships or conflict resolution and building partnership. (know about) knowledge of business processes and knowledge of train wrecks or history of institution, decision making or strategic planning. (know why) good and clean governance knowledge, which is related transparency, citizen participation or engagement and accountability, or public policy advocacy

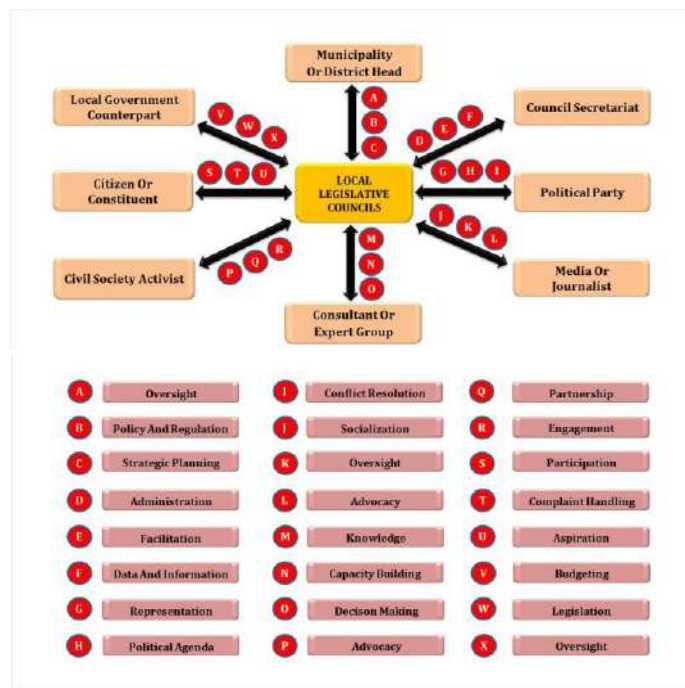


Figure 1. Relationship Of The Regency/Municipal House Of Representatives (DPRD)

## **5. Conclusions**

Four main valuable knowledge types have been identified in the context of legislative councils have emerged from the interviews, these including first, tasks and authorities knowledge (know how), second relational knowledge (know with), third organisational knowledge (know about), fourth, good and clean governance knowledge (know why). The regency/municipal house of representatives (DPRD) organization has not yet optimized the management of the knowledge it has to carry out all its activities. There are still many assets in the form of knowledge that are created, stored, and distributed, which are often not integrated and connected, resulting in problems such as loss of knowledge, not fulfilled needs for knowledge, and knowledge gaps. The consequences are forming culture and develop habits for sharing data and knowledge and using accurate data and storing data owned neatly. And with the greater volume of data and the complexity of data requirements, it is almost impossible to manage knowledge within the organization manually. It is important to develop of knowledge management system that is used to manage knowledge at each stage, both at the time of acquisition, storage, retrieval, utilization and improvement. and finally formulate knowledge management strategy.

## **Acknowledgments**

The authors would like to thank the Directorate of Research and Community Service, the Directorate General of Strengthening Research and Development of the Republic of Indonesia Ministry of Research, Technology and Higher Education which has provided financial support to this research.

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## Chapter 11

### Modelling The Financial Planning: An Analysis Of Fast Moving Investment Banks In Malaysia

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**Abstract** - The objective of this paper is to examine the factors that influence the financial planning towards financial performance for Malaysian investment banks. 228 respondents from 11 investment banks are used in this paper. This study uses questionnaires survey for the data collection. Numerous techniques such as diagnostic tests, descriptive analysis, Pearson's correlation analysis and multiple regression analysis are used to executive the hypothesis tests following by the research results. The multiple regression results show working capital management, budgeting and investment decisions are the main factors influence the financial planning for Malaysian investment banks. However, the capital structure does not has any impact to the financial planning for Malaysian investment banks. Practical Implications - The results of this paper could be applied to the management team that responsible for financial planning in the investment banks. Furthermore, this paper contributes to the existing knowledge of financial planning in the context of investment banks. This paper highlights an important issue of financial planning. It analyses the impact of working capital management, budgeting, investment decisions and capital structure to the financial planning of Malaysian investment banks.

**Keywords:** Investment banks, financial planning, working capital management, budgeting, investment decisions, capital structure

#### 1. Introduction

Financial planning refers to the decision making on spending behaviour such as what to spend, how to spend and the amount that need to be spent. According to Akrani (2011) financial planning should be done from an individual to a large multi-national firm. Hence, a financial plan provides a comprehensive financial activities of the firm. For instance, this includes the capital requirement

and the source of financing in an effective manner.

The more amount of capitals that used by someone, the additional effort is required to create a plan for utilizing that amount of capital in a suitable and efficient way. Among the objective of financial planning is to ensure that the adequate funds are available for gratifying the needs of expenses, buying a long-term assets, and forecasting the expected costs. Financial planning is not conducted in order to ensure finance is existing on time.

Moreover, for the company to recognize from where to gather the cash and determine when the company needs the cash, the financial planning also aims to manage the money that go in and out of the business. Not only a deficiency of money which could create difficulties, however, excessive of money also could be difficult to control. Certainly, the company will find difficulty to operate if there is a deficiency of funds.

However, having excessive money which not utilizing it in an efficient way is a tremendous wasting. The firm should be searching for a way in order to invest the money and ensure that having an expansion plan in place when they are having funds this based on (Kumaran, 2015). Apart from that, financial planning also intends to evaluate the financial resources to conduct programmes and activities in order to accomplish the required goals and aims of the plan.

Banks represent a significant part in the economic development of every nation. Banks are an essential component of the financial system and vital players in the financial markets. Financial performance refers to the bank's achievements in terms of profitability based on (Dhanabhakya & Kavitha 2012). The banking sector is considered a significant source for financing majority of the business. Increasing the financial performance will result in enhancing the functions and activities of the organisation.

Moreover, for enhancing the financial performance of the financial institutions there are several factors that need to be observed and among of them are the bank's size, its asset management, leverage ratio, operational efficiency ratio and its credit risk (Alkhatib, 2012). Investment banks are considered to be the most significant contributor in developing the economy of the country as well as investment banks are offered a huge effect on the country capital and credit markets (Ilahi, Jamil, & Kazmi, 2014).

The measurement of the financial situation and the performance is considered descriptive and analytical. The descriptive comprise of assets, liabilities, shareholders equity, revenues, expenses as well as net revenue, whereas the analytical measures of the financial situation and performance comprise of profit,

productivity, liquidness and also the solvency (Adam, 2014).

Akinsulire (2006) Stated that the financial performance of the financial institution could be measured by utilizing a group of analysing the ratios, benchmarking, and the performance measure alongside the budget or combine of these methods. The financial statements of the financial institutions contain a diversity of the financial ratios that are designed in order to give an indication about the performance of corporations.

## **2. Literature Review**

### **2.1. Working Capital Management**

Numerous studies have been conducted on the working capital management such as the study that have been conducted by Le, Vu, Le, Du, and Tran (2018)) shows that working capital management positively influence the financial performance of listed firms in Vietnam. Godswill, Ailemen, Osabohien, Chisom, and Pascal (2018) study how bank's profitability could be enhanced through working capital management. They revealed that working capital management has a significant impact on the profitability of selected banks in Nigeria. Based on the study of Mandiefe (2018), who found that working capital management influence the financial performance of Afriland first bank effectively in Cameroon. The result is also compatible with Jama, Muturi and Samantar (2018), who studies the effect of working capital management practices on financial performance of retail firms in Garowe, Puntland state of Somalia, found that working capital managemet practices has a positive impact on the financial performance. Madugba and Ogbonnaya (2016) shows that the efficient working capital management will enhance the financial performance of manufacturing firms.

As well as in Kenya context, Kiptoo, Kariuki and Maina (2017), in their study on working capital management shows that working capital management has a negative significant relationship with financial performance of the tea processing firms. Waithaka (2012), found that there is a positive relationship between components of working capital management and financial performance of the agricultural companies in Kenya.

H1: There is a positive relationship between working capital management and financial performace.

## 2.2 Budgeting

Many empirical researches have been undertaken in order to examine the influence of budgeting on financial performance. Most of the researchers concluded that budgeting has a significant impact on the financial performance in general. Agbenyo, Danquah and Shuangshuang (2018) their study revealed that budgeting plays imperative roles in financial performance of listed manufacturing companies in Ghana. As well as the study also found there is a positive correlation between budgeting and financial performance.

In Nigeria context, studied from Isaac (2018) study the impact of budgeting and planning on the performance of financial institutions. The overall finding shows that budgeting and planning has positively influence Nigerian banks' performance. According to Simiyu, Manini, and Singoro (2018), they revealed that budget participation and budget communication has strong positive relationship with financial performance of public sugar companies in Kenya. Simultaneously the study found that budget participation and budget communication has impact on financial performance of sugar companies significantly in Kenya.

Masakala, Omol, Wauyo, and Okumu (2017) their study was conducted in order to examine the relationship between budgeting process and financial performance of Bugisu Cooperative union Ltd in Uganda. Their study shows that there is positive relationship between process of budgeting and the financial performance.

In addition, there are many studies conducted in Somalia and Ghana by Mohamed and Ali (2013); Pimpong and Laryea (2016) respectively. Study the impact of budgeting on the financial performance. Their results illustrated that there is a moderate positive relationship between budgeting and the financial performance of the remittance firms in Mogadishu, Somalia and in non-bank financial institutions in Ghana.

Furthermore, there are many studies conducted on budgeting such as Onduso (2013), found that there is a strong positive impact of budgets on the financial performance on manufacturing firms as measured by return on assets in Nairobi County, Kenya. The majority of the participants are strongly agreed that budget is a truly management tool and utilized in decision making.

H2: There is a positive relationship between budgeting and financial performance.

### **2.3 Investment Decisions**

Numerous studies undertaken on the influence of investment decisions on financial performance. Mweresa, and Muturi (2018) they examine the effect of investment decisions on financial performance of sugar firms in western Kenya. The findings revealed that investment in production has strong influence on the financial performance. The investment in the distribution chain decision has a moderate influence on financial performance; however, investment in financial assets is having a little impact on the financial performance of sugar firms in western Kenya.

On the other hand, Hajering, Mahfudnurnajamuddin, Dani and Su'un (2018) study the influence of investment decisions, funding decisions and dividend policies on financial performance and the value of banking companies listed in Indonesia stock exchange. Their results showed that investment decisions and funding decisions has positive and insignificant impact on the financial performance. In addition, Efni (2017) shows that investment decisions has a significant direct influence on the corporate value. That indicates the right investment decisions will enhance the corporate value. Which means the investment decisions could generate higher return than the cost of capital that incurred by firms.

According to Karanja (2012) shows that investment decisions affected the financial performance of small and medium scale enterprise, in Limuru town, Kenya. And also Kipkorir, Namiinda and Njeje (2016), their results demonstrated that investment decisions influence the financial performance of SACCOs in Baringo County. According to Kemuma (2014), examines the impact of investment decisions on the performance of the listed companies in Nairobi securities exchange, Kenya. The study revealed that there is a significant positive correlations between return on assets and all the predictor variables, which is, Investment Decision, Financial Leverage and Liquidity.

H3: There is a positive relationship between investment decisions and financial performance.

### **2.4 Capital Structure**

There are many research conducted on the banking industry about the influence of capital structure on the financial performance, such as El-Chaarani and El-Abiad (2019) they examine the capital structure and financial performance of banking sector in Middle East countries for the period 2011 to 2016. Their study involved 143 banks and 723 observations from eight countries which (Lebanon,

Qatar, Kuwait, Jordan, Oman, Iran, the Kingdom of Saudi Arabia and the United Arab Emirates). They found that capital structure influence the performance of banking sector measured by profitability ratios.

Nwude and Anyalechi (2018) they study the impact of capital structure on organizational performance utilizing 10 commercial banks between 2000 and 2013 in Nigeria. . Their study found that debt financing negatively and significantly influence return on asset of commercial banks in Nigeria, Equity finance exert positive and non-significant influence on return on asset, while debt-equity ratio had negative and non-significant influence on return on asset.

Based on Siddik et al. (2017) the results of their study demonstrated that capital structure inversely influence bank performance. In Malaysia capital structure studies, Tan and Hamid (2016), they investigated the relationship between capital structure and the financial performance of 41plantation-listed companies in Bursa Malaysia from year 2007 to 2011. Their findings shows that there is relationship and significant influence between capital structure and corporate performance in Malaysia plantation sector companies.

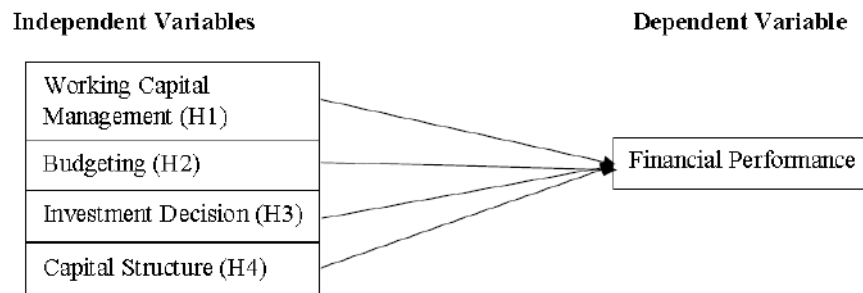
While Al-Qudah (2017) in his study examines the relationship between capital structure and financial performance and found that there is positive relationship between the capital structure and the financial performance by using debt ration as well as the profitability as a return on assets on the listed companies in Abu Dhabi securities exchange.

However, Pastory, Marobhe and Kaaya (2013), in their results illustrated that there is a negative relationship between capital structure and bank performance due to they indicated negative coefficients. According to Taani (2013), found that bank performance, which is measured by net profit, return on capital employed and net interest margin is significantly and positively related with total debt. Whereas the total debt is insignificant in specifying the return on equity in Jordanian banking industry.

Hence, this paper examines the factors that influence financial planning which are working capital management, budgeting, investment decisions and capital structure towards financial performance of Malaysian investment banks. In addition, this paper is completely different from the previous studies through focusing on investment banks in Malaysia. According to the knowledge of researchers, there is no study in Malaysia or even outside of Malaysia studied this topic up to date.

H4: There is a positive relationship between capital structure and financial performance.





*Source: Author's Own Sketch*

Figure 1: Conceptual Framework

Figure 1 shows the conceptual framework of the hypothesis development according to the anticipated relationship between independent variables and dependent variable.

### 3. Data and Methodology

#### 3.1 Questionnaire Design

This paper utilised survey questionnaires research instrument for gathering the data from the population under this paper. The survey questionnaire is comprised of two sections, section one describes the demographic profile of the respondents of this paper such as gender, age, working experience, education and income level. While section two consists of questions that are related to variables of this paper. This paper designs 228 survey questionnaires and then distributed that among workers in the department of finance at Malaysian investment banks.

#### 3.2 Measurement

This paper employed the Likert scale in order to reply the questions with possibility of five score responses 1: Strongly disagree 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly agree.

Working Capital Management (Kiptoo, Kariuki & Maina, 2017)

1. Working capital management ensures high return on assets
2. Credit facilities enables to adequately finance its operations
3. Working capital management improves the net Profit
4. Working Capital management practices increase revenue
5. Working capital management guidelines avoid bankruptcy

6. Working capital management affects liquidity

Budgeting (Tunji, 2013) (Onduso, 2013) (Orendo & Muturi, 2017)

1. Budgets are used as estimates to source for capital
2. Budgeting technique is important
3. The budget is derived from previous budget
4. Budgets are used as a guide to make a new investments
5. Budgets are used to motivate staff
6. Budgeting leads to better financial planning

Investment Decisions ( Kipkorir, Namiinda , & Njeje, 2015)

1. There is sufficient information about the type of investment
2. Investment decisions affects performance
3. Investment has increased the profitability
4. The investment bank invests members fund prudently
5. We incur a lot of costs in recovering loans
6. The level of inflation affects the interest rate

Capital Structure ( Mauwa, Namusongeand & Onyango, 2016) (Njeri & Kagiri, 2013)

1. It is not easy to raise funds from external parties
2. The rights of the equity holders is clearly stated
3. The return of investment attracts the investors.
4. The investment bank controls its leverage
5. Capital structure influences the success of investment bank
6. Investment bank relies heavily on equity financing

Financial Performance ( Kipkorir, Namiinda , & Njeje, 2015) (Kamau & Bosire ,2015)

1. Investment bank has a high return on assets
2. Credit reporting helps in defining good and bad borrowers
3. Creditors repay loans promptly
4. Accounting system identifies the receipts and expenditures
5. High return on asset increases the profit
6. Productivity level is relatively high

### **3.3 Procedure**

In this paper, researchers distributed the survey questionnaires by hand, simultaneously sent an email as google form through obtaining an assistance from a friend who aids to send an email of the survey questionnaires into the email of the employees who works at the department of finance at investment banks in Malaysia. After gathering 228 survey questionnaires from respondents, researchers entered the data into SPSS (Statistical Package for the Social Sciences). Then researchers employed numerous techniques such as validity, reliability, diagnostic tests, multiple regression analysis, correlation and descriptive analysis in order to analysis the data and execute the hypothesis tests of this paper.

### **3.4 Data Analysis**

In this paper, the data were analysed through utilising statistical package of social sciences (SPSS version 25.0). The data that have collected have been tested using descriptive analysis , correlation , validity, reliability, diagnostic tests, and multiple regression analysis.

#### **3.4.1 Validity Test**

Validity is considered an important requirement for both quantitative and qualitative research, as an invalid research is consider worthless. The validity of questionnaire rely on either respondents reply to the survey questionnaire accurately, honestly and correctly. The validity of data could be enhanced by careful sampling, suitable instruments and statistical treatments of the data Cohen, Manion, et al. (2005). Researchers applied validity test to measure the validity of the data.

### 3.4.2 Reliability Test

In this paper, researchers conducted the reliability test through using SPSS software to measure the reliability of the data. According to Tavakol and Dennick (2011), if the reliability coefficient of Cronbach's alpha is less than 0.5, then the internal consistency of data is unacceptable. While if the reliability coefficient of Cronbach's alpha is greater than 0.7, then the internal consistency of data is acceptable. Thus in this paper researchers found the value of Cronbach's alpha is greater than 0.7 which indicates that internal consistency of data is acceptable and also questions are reliable and acceptable.

### 3.4.3 Multiple Regression Analysis

This paper employed multiple regression analysis to measure the relationship between dependent variable and independent variables. Thus the regression equation of this paper will be as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u_i$$

Whereby Y = financial performance (dependent variable). X = independent variables.  $\beta_0$  is a model parameter that shows the mean value of the dependent variable (Y) when the value of the independent variables (X) is equal to zero. In other words, we could say  $\beta_0$  = the intercept of the regression line.  $\beta_1, \beta_2, \beta_3, \beta_4$ , these are parameters of a model which show the change in the value of the dependent variable especially when there is a unit change in the independent variables.  $u_i$  = an error term which represents the influence of all factors other than independent variables on the dependent variable Kumar, Talib and Ramayah (2013).

## 4. Results

Table 1. Results of Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Gender	228	1.00	2.00	1.5307	.50015
Age	228	2.00	5.00	2.8772	.95392
Working Experience	228	1.00	5.00	2.9693	1.44927
Education	228	1.00	4.00	2.7675	.67908
Income	228	1.00	5.00	2.8377	1.15533
Valid N (listwise)	228				

Source: Author's own sketch

Table 1 above shows a summary of descriptive statistics of demographic profile of respondents of this paper. Based on table 1 above it is obviously shows that the mean for gender was 1.53%, while the mean of Age, working experience, education and income were 2.87%, 2.96%, 2.76 and 2.83% respectively. That shows working experience has a higher mean value of 2.9693 with standard deviation of 1.44%. While gender has a lower mean value of 1.5307 with the standard deviation of 50.015%.

Table 2. Results of Correlations

Correlations						
	N	WCM	B	ID	CS	FP
WCM	228	1	.051	.103	.149*	.236**
B	228	.051	1	.145*	.180**	.180**
ID	228	.103	.145*	1	.193**	.201**
CS	228	.149*	.180**	.193**	1	.159*
FP	228	.236**	.180**	.201**	.159*	1
*. Correlation is significant at the 0.05 level (2-tailed).						
***. Correlation is significant at the 0.01 level (2-tailed).						

Source: Author's own sketch

Table 2 depicts the results of correlation coefficient analysis of all variables of this paper. The results shows that all independent variables are correlated with dependent variable. In this paper working capital management, budgeting, investment decisions and capital structure are the independent variables with value .236, .180, .201, .159 respectively. All independent variables have a positive significant correlation with financial performance.

Table 3. Results of the Validity and the Reliability Tests

Variables	Validity Test	Reliability Test
	Kaiser-Meyer-Olkin (KMO)	Cronbach's Alpha
WCM	0.803***	0.740
B	0.766***	0.715
ID	0.778***	0.735
CS	0.835	0.700
FP	0.735	0.737

Source: Author's own sketch

Note: \* and \*\* denote 5% and 1% level of significance respectively.

As observed in table 3 above, validity and reliability test were conducted. The KMO test of working capital management, budgeting,

investment decisions, capital structure, and financial performance are considered a valid factor because all values are bigger than 0.6. The highest value of KMO is 0.835 for capital structure and that shows the relationships among the items are good and they are suitable for the factor analysis. While the lowest value of KMO is 0.735 for financial performance and that indicates the relationship among the items are adequate and they are suitable for factor analysis.

Furthermore, the table 3 above, illustrates the result of reliability test for working capital management, budgeting, investment decisions, capital structure and financial performance is 0.740, 0.715, 0.735, 0.700 and 0.737 respectively, that indicates the data which have been collected having a high reliability and will be used for generating the findings of this paper. As we could see from the table 3 above, the highest value of Cronbach's Alpha is 0.740 for working capital management that indicates the data is highly reliable. While the lowest value of Cronbach's Alpha is 0.700 for Capital structure and that also indicates the data is reliable.

Table 4. Results of Regression for the Financial Performance

<b>Independent construct</b>	<b>Coefficients</b>	<b>t-statistics</b>
Constant	1.340	3.198*
WCM	0.229	3.173*
B	0.159	2.095**
ID	0.149	2.252**
CS	0.053	1.157
<b>Diagnostic Test</b>		
VIF	1.029 – 1.082	
R-square	0.114	
F-value	7.153	
P-value	0.000	

*Source: Author's own sketch*

Note: \* and \*\* denote 5% and 1% level of significance respectively.

As observed in table 4 above, the VIF is less than 5 and the Durbin Watson statistics value is 1.705 which is lesser than 2 and that means there is a positive autocorrelation in a data set. The assumption of the normality, linearity and homoscedasticity of residual are met. The R square is 0.114, which means the combined influence of all predictors illustrates that 0.114 of the variation in the dependent variable (Financial performance). While the F value is 7.153 which indicates that the relationship between variables is statistically significant, as well as P value is 0.000 which less than the acceptance standard value 0.05 and that indicates all variables are statically significant.

Based on the table 4 above, the working capital management has a positive and significant relationship with financial performance due to B equal to 0.229 while P value = 0.002 which indicates the P value is less than 0.05. Hence, the findings express that an increase in working capital management by 1 unit leads to enhance the financial performance by 0.229 units. The budgeting has a positive and a significant relationship with the financial performance because B= 0.159, P value = 0.037 which indicates the P value is less than 0.05 as well.

Hence, the findings express that an increase in budgeting by 1 unit leads to enhance the financial performance by 0.159. Besides that, the investment decisions has a significant relationship with financial performance because the P value = 0.025 which is less than 0.05. That express an increase in investment decisions by 1 unit leads to enhance the financial performance by 0.149. Whereas, the capital structure and financial performance has no significant relationship due to the P value = 0.249 which is bigger than 0.05. Therefore, Hypotheses H1, H2, H3 are supported, while H4 is not supported.

Table 5: Hypothesis Testing

No.	Hypothesis	Beta/ P-Value (Sig)	Results
H1	There is a positive relationship between working capital management and financial performance.	0.229/ 0.002	Supported
H2	There is a positive relationship between budgeting and financial performance.	0.159/ 0.037	Supported
H3	There is a positive relationship between investment decisions and financial performance.	0.149/ 0.025	Supported
H4	There is a positive relationship between capital structure and financial performance.	0.053/ 0.249	Not Supported

Source: Author's own sketch

Note: \* and \*\* denote 5% and 1% level of significance respectively.

Table 5 above, illustrates the hypothesis of this paper which is the relationship between working capital management, budgeting, investment decisions, capital structure, and financial performance. This paper reveals that working capital management has a positive relationship with financial performance of Malaysian investment bank. Hence, this result consistent with several previous studies such as Mugo (2014), Waithaka (2012), Jama et al. (2018).

In addition, this paper reveals that budgeting has a positive relationship with financial performance of Malaysian investment banks. Therefore, this findings consistent with several previous studies, such as the study that have been

conducted by Mohamed and Ali (2013), Onduso (2013), Pimpong and Laryea (2016). Besides that, investment decisions has a positive relationship with financial performance of Malaysian investment banks. The result is consistent with Karanja (2012), Kipkorir et al. (2016), Kemuma (2014). On the other hand, the results shows that the capital structure has no relationship with financial performance of Malaysian investment banks. This result inconsistent with study that have been conducted by Al- Qudah (2017), Siddik, et al. (2017), Pastory et al. (2013). This paper summarises that working capital management, budgeting, and investment decisions have a positive relationship with financial performance of Malaysian investment banks. However, capital structure has no relationship with financial performance of Malaysian investment banks.

## **5. Discussion**

In this paper, the researchers examined the influence of financial planning which represents by working capital management, budgeting, investment decisions and capital structure on the financial performance of Malaysian investment banks. This paper revealed that working capital management, budgeting and investment decisions have a positive relationship with the financial performance. In contrast, capital structure has not relationship with financial performance of Malaysian investment banks.

### **5.1. Discussion H1**

In this paper the first aim was that to investigate the influence of working capital management on the financial performance, the output of this paper shows that majority of respondents agreed that working capital management influence the financial performance of the investment banks in Malaysia positively. Moreover, according to regression analysis the findings express that an increase in working capital management by one unit leads to enhance the financial performance by 0.229 units.

The first hypothesis of this paper was there is a positive relationship between working capital management and financial performance and the researchers found the result of this paper is supporting this hypothesis.

### **5.2. Discussion H2**

The second aim of this paper was to investigate the influence of budgeting on the financial performance. The findings of this paper reveals that majority of respondents agreed that budgeting influence the financial performance of investment banks in Malaysia positively. Based on the multiple regression output



indicates the budgeting has a positive and a significant relationship with financial performance.

In addition, the findings express that an increase in budgeting by one unit leads to enhance the financial performance of investment banks by 0.159. The second hypothesis of this paper was there is a positive relationship between budgeting and financial performance and the researchers found that result of this paper is supporting this hypothesis.

### **5.3. Discussion H3**

The third aim of this paper was to investigate the influence of investment decisions on the financial performance. The output of this paper shows that most of respondents agreed that investment decisions influence the financial performance of the investment banks in Malaysia. The third hypothesis of this paper was there is a positive relationship between investment decisions and financial performance. Researchers found that result of this paper is supporting this hypothesis. In addition, the findings express that an increase in investment decisions by one unit leads to enhance the financial performance of investment banks by 0.149.

### **5.4. Discussion H4**

The fourth aim of this paper was to investigate the influence of capital structure on the financial performance. The output of this paper shows that majority of respondents agreed that capital structure does not influence the financial performance of the investment banks in Malaysia. The last hypothesis of this paper was there is a positive relationship between capital structure and financial performance. The researchers found that result of this paper is not supporting this hypothesis.

## **6. Contribution**

The contribution of this paper includes the following:

This paper results could be implemented to the management team that responsible for financial planning in Malaysian investment banks. Moreover, this paper contributes to the existing knowledge of financial planning in the context of investment banks. This paper highlights an important issue of financial planning. It analyses the impact of working capital management, budgeting, investment decisions and capital structure on the financial performance of Malaysian investment banks. Besides that, the findings of this paper also will assist the policy

makers in Malaysian government to understand the factors that enhance the financial performance of Malaysian investment banks. As well as the results of this paper are useful to financial institutions in Malaysia as it will highlight the factors that influence the financial performance of Malaysian investment banks. This paper could have useful practical implications to the investment banks that are operating in Malaysia.

In addition, the employees who is responsible for planning in the department of finance in Malaysian investment banks will obtain a huge advantage from how working capital management, budgeting and investment decisions lead to better financial performance. This paper will also will add an advantage to the library due to the unique of this paper.

## **7. Conclusions**

This paper is conducted with aim to determine and explore the influence of financial planning on the financial performance of Malaysian investment banks. In conclusion, the findings of this paper reveals that working capital management, budgeting and investment decisions have a positive significant relationship with financial performance of Malaysian investment banks. On the other hand, the findings of this paper reveals that capital structure has no relationship with the financial performance of Malaysian investment banks. The limitation of this paper is that it conducts solely on investment banks in Malaysia, and does not involve other banks that operating in the country. The researchers gathered the data from eleven investment banks in Malaysia through distributing 228 Survey questionnaires among employees in the finance department . This paper does not depend on gathering the secondary data from the annual report or financial statements.

Moreover, the scope of this paper was limited to examine the influence of working capital management, budgeting, investment decisions and capital structure on the financial performance of Malaysian investment banks. Therefore, the future researchers could concentrate on the other variables that influence the financial performance of Malaysian investment banks or other financial institutions.

In this paper, researchers concentrate on the investment banks in Malaysia, therefore, the future researchers and academicians could conduct their study on commercial banks or Islamic banks that operating in Malaysia. While this paper utilises survey questionnaire research instrument to gather the data from the respondents of this paper. Future researchers are recommended to use secondary data to measure the financial performance of Malaysian investment banks. Besides

that, future researchers could conduct comparative research to compare the financial performance of investment banks in Malaysia with other investment banks in other nation.

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## Chapter 12

### Customer Willingness With Green Smart Power : A Survey Of 450 Households In Surabaya, Indonesia

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**Abstract** - Currently the community is aggressively implementing energy-efficient uses, as well as utilizing renewable energy, to save the earth. And in order to become part of an environmentally conscious community that uses clean energy, inevitably electricity customers must change their lifestyle. State Electricity Company East Java Distribution Unit launched Green Smart Power program to accommodate it. Before advising customer to change to solar panel system we need to understand their willingness to do so. Based on the theory of planned behavior (TPB), this study examines the factors related to customer willingness (CW). A survey was conducted in Surabaya with 450 participants. This study uses regression model with SPSS software. Based on the findings, suggestions are made to properly introduce solar panel system in Surabaya.

**Keywords:** Green Smart Power, Theory of Planned Behavior, Customer Willingness.

#### 1. Introduction

Our environment is constantly changing. We need to be increasingly aware of the problems that surround it such as warming and cooling periods, different types of weather patterns, the influx of natural disasters and much more (McCarty, 1994; Laroche et. al., 2001; CNN, 2019; Han et. al., 2019,). Furthermore, awareness of environmental consequences have become a major issue in Indonesia today, and pro-environmental activity is now treated as 'essential' instead of as 'optional'.

Currently the community is aggressively implementing energy-efficient uses, as well as utilizing renewable energy, to save the earth. Not a few, who use solar energy as a source of electrical energy. This eco-friendly lifestyle is in high demand of the upper middle class to the millennial. In order to become part of an

environmentally conscious community that uses clean energy, inevitably electricity customers must change their lifestyle. For example, switching to household appliances that use electricity. If the use of fossil-fueled vehicles or household appliances is reduced, imports of fuel and LPG can be suppressed.

Utilization of energy from natural resources, apparently is being used by State Electricity Company of East Java Distribution Unit (UID) which offers package or bundle to people who want to live an environmentally friendly lifestyle. State Electricity Company of Java Distribution Unit (UID) launched the Green Smart Power program on Saturday 27 July 2019. Green Smart Power is one of the ways State Electricity Company is encouraging the use of clean and renewable energy. Later, electrical energy that has been sourced from fossil fuel plants will be replaced with solar powered plants. Green Smart Power is a service package that contains solar panels, internet, and premium services, or non-outages. With this bundle, people are expected to have a lifestyle, because on average now, the world has used clean energy.

In addition, this step can help the government in reducing fuel imports. Indonesia's biggest imports are in BBM and LPG. If the use of fuel can be reduced by electric vehicles, and the use of LPG can be reduced by an electric stove, it would be very helpful. (Jpnn.com, 30 July 2019).

## **2. Hypotheses**

Customer Willingness (CW) represents planned behaviour whose mechanism and influencing factors can be analysed by the theory of planned behaviour (TPB). According to TPB, behavioural intention is determined by three factors: attitude towards the behaviour (AB), subjective norms (SN) and perceived behavioural control (PBC). Each factor is in turn generated by a number of beliefs and evaluations. In the case of CW, intention denotes the subjective probability of a customer to convert from the uses of conventional electricity to solar panel system: the greater the probability, the stronger the intention. This intention can be affected by AB, SN and/or PBC factors. Based on TPB, this paper considers these factors, with each factor composed of three sub-factors.

### **2.1. Customers' attitude towards behaviour**

Attitude towards behaviour (AB) is a function of beliefs and evaluations. An individual's assessment of an action is affected by his or her behavioural beliefs. Customers' attitude refers to the general feelings towards Green Smart Power, either favourable or unfavourable. Customers have choice store conventional electricity to convert Green Smart Power. To examine their attitude



towards Green Smart Power, the following three sub-factors are considered: (1) quality of life, (2) monthly out-of-pocket expenses and (3) durability. According to the literature (Gustavsson and Ellegard, 2004; Wijayatunga and Attalage, 2005; Mondal and Klein 2011; Komatsu et al., 2011b; Dahlstrom et al., 2012), pollution is reduced and life becomes more enjoyable when using Green Smart Power. Thus, Green Smart Power connote a higher quality of life. Although using solar products can save money on fuel resources (Schnieders and Hermelink, 2006; Zhu et al., 2009; Komatsu et al., 2011a), installation and maintenance may lead to extra expenses. If monthly expenses exceed previous expenses incurred while using Green Smart Power, customers will not be satisfied (Zhang et al., 2012). If durability is enhanced relative to that of conventional electricity, customers should be satisfied. Correspondingly, the three following hypotheses are proposed.

H1: The increased quality of life compared to conventional electricity would have a positive impact on CW.

H2: Additional monthly out-of-pocket expenses after converting to Green Smart Power would have a negative impact on CW.

H3: The increased durability of Green Smart Power compared to conventional electricity would have a positive impact on CW.

## **2.2. Customers' subjective norms**

Subjective norms (SN) is a function of an individual's beliefs regarding whether he or she should perform a particular act based on the opinions of other people or groups. In the process of converting conventional electricity to solar houses, SN particularly refers to possible pressures from customers' family members, neighbours, local governments, the collective organisations of a village, the economic organisations of a village and zoning regulations for Green Smart Power construction. The pressures can be either positive or negative and may certainly have impacts on CW. With respect to the influence of SN on CW, this paper examines three sub-factors: government commitment, the opinions of family members, friends and neighbours and the maturity of the local solar market. (1) Monetary policies are extremely crucial for Green Smart Power (Ketlogestwe and Mothudi, 2009; Mondal, 2010; Sovacool et al., 2011). Customers show more willingness when the government makes strong commitments. (2) Customers tend to listen to the opinions of the relatives, friends and neighbours. (3) Based on previous experience regarding the use of Solar Panel System, CW is affected by opportunity of using Solar Panel System. Thus, the following three hypotheses are proposed.

H4: Government commitments would have a positive impact on CW

H5: Neighbours'/friends' opinions would have a positive impact on CW

H6: Opportunity of using Solar Panel System would have a positive impact on CW

### **2.3. Customers' perceived behavioural control**

Perceived behavioural control (PBC) reflects an individual's ability to control behaviour and is affected by control beliefs. In this paper, PBC describes customers' perceptions of available knowledge, resources and opportunities for making the transition to Green Smart Power. Individuals with more resources and opportunities will have stronger control beliefs and perceived power. The most important factors relating customers' beliefs with behaviour include available funding, possible subsidy, quality and reliability of solar panel system and family finances. Historically, a customer would gather all available resources and information before making any major purchase. For solar panel system, such PBC will lead to CW when resources and other necessary conditions are met. Thus, this paper examines three sub-factors influencing PBC: switching cost associated with converting a conventional electricity to Green Smart Power, popularity and to construct solar houses. (1) Eventhough different families have different financial status. Due to limited financial resources, the higher the switching cost is, the lower CW becomes. (2) Due to bandwagon effects, an increase in the popularity of Green Smart Power would lead to higher CW. (3) if customers can determine and control the appropriate time frame for Green Smart Power, they will show more willingness. Thus, the following three hypotheses are proposed.

H7: A high switching cost of converting from a conventional electricity to Green Smart Power would have a negative impact on CW

H8: The popularity of Green Smart Power would have a positive impact on CW

H9: How much control customers have over construction timing would be positively correlated with CW

## **3. Research Design**

### **3.1. Measurement instrument**

The items on attitude, subjective norm and perceived behavioural control were based on existing validated measures obtained from the literature (Ajzen, 1991). According to the realistic situation of rural China, the measures were properly modified. As illustrated, there are nine indicators from one independent

variable (items), each with a seven-point Likert scale. Both mean and standard deviation values are also tabulated

### **3.2. The survey**

The survey was conducted in the city of Surabaya as the capital of the East Java Province which is also the second largest city in Indonesia. Surabaya has an area of around 350.54 km<sup>2</sup> with a population of 2,941,981 inhabitants (2019). The Surabaya metropolitan area, Gerbangkertosusila, which has a population of around 10 million, is the second largest metropolitan area in Indonesia after Jabodetabek. Like other cities in Indonesia, the city of Surabaya has a tropical climate that consists of two seasons a year, namely the rainy and dry seasons. At Juanda Station Surabaya, it was noted that the average humidity ranged from 68% to 84% with air pressures of 1010.4 Mbs to 1011.6 Mbs. The average temperature at the station ranges from 27.8 ° C to 30.5 ° C and the duration of sunlight between 36% to 89%. Surabaya is very interesting to be a pilot smart city that uses solar systems for households with electricity usage from 3500 kwh up to the top. There are 500 houses that were targeted by the survey with electrical power installed 3500 kwh and above in the middle to upper housing complex and luxury housing around the city of Surabaya. The survey was conducted from August to September by distributing questionnaires conducted by two methods, there were questionnaires that were distributed through the housing group and were known by the housing administrator and some were distributed directly by conducting interviews with heads of households. Both surveys conducted online through residential groups or direct interviews are always attached with an explanation of the benefits of the solar system method for households and an estimated cost for installation.

### **3.3. Descriptive analysis**

Among the 500 households that were targeted by the survey, we only received 450 replies, with 328 answering "yes" or expressing a desire to turn their traditional house into a solar house. The answers from the remaining 122 households are "no," "not sure" or "wait and see", all of which are classified as "no" answers. In The demographic characteristics of the participants were tabulated: gender, age, level of education, family size, having children in college, and the amount of electricity installed.

#### 4. Result and Discussion

Table 1. Correlation result on survey customer willingness

		Correlations									
		X1	X2	X3	X4	X5	X6	X7	X8	X9	TPB
X1	Pearson Correlation	1	,552 <sup>**</sup>	,457 <sup>**</sup>	,376 <sup>**</sup>	,372 <sup>**</sup>	,378 <sup>**</sup>	,372 <sup>**</sup>	,378 <sup>**</sup>	,372 <sup>**</sup>	,689 <sup>**</sup>
	Sig. (2-tailed)		,000	,000	,000	,000	,000	,000	,000	,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X2	Pearson Correlation	,552 <sup>**</sup>	1	,491 <sup>**</sup>	,197 <sup>**</sup>	,153 <sup>**</sup>	,197 <sup>**</sup>	,153 <sup>**</sup>	,197 <sup>**</sup>	,153 <sup>**</sup>	,515 <sup>**</sup>
	Sig. (2-tailed)	,000		,000	,000	,001	,000	,001	,000	,001	,000
	N	450	450	450	450	450	450	450	450	450	450
X3	Pearson Correlation	,457 <sup>**</sup>	,491 <sup>**</sup>	1	,489 <sup>**</sup>	,134 <sup>**</sup>	,489 <sup>**</sup>	,134 <sup>**</sup>	,489 <sup>**</sup>	,134 <sup>**</sup>	,618 <sup>**</sup>
	Sig. (2-tailed)	,000	,000		,000	,004	,000	,004	,000	,004	,000
	N	450	450	450	450	450	450	450	450	450	450
X4	Pearson Correlation	,376 <sup>**</sup>	,197 <sup>**</sup>	,489 <sup>**</sup>	1	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	,823 <sup>**</sup>
	Sig. (2-tailed)	,000	,000	,000		,000	,000	,000	,000	,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X5	Pearson Correlation	,372 <sup>**</sup>	,153 <sup>**</sup>	,134 <sup>**</sup>	,437 <sup>**</sup>	1	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,731 <sup>**</sup>
	Sig. (2-tailed)	,000	,001	,004	,000		,000	,000	,000	,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X6	Pearson Correlation	,376 <sup>**</sup>	,197 <sup>**</sup>	,489 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	,823 <sup>**</sup>
	Sig. (2-tailed)	,000	,000	,000	,000	,000		,000	,000	,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X7	Pearson Correlation	,372 <sup>**</sup>	,153 <sup>**</sup>	,134 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1	,437 <sup>**</sup>	1,000 <sup>**</sup>	,731 <sup>**</sup>
	Sig. (2-tailed)	,000	,001	,004	,000	,000	,000		,000	,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X8	Pearson Correlation	,376 <sup>**</sup>	,197 <sup>**</sup>	,489 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1	,437 <sup>**</sup>	,823 <sup>**</sup>
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000		,000	,000
	N	450	450	450	450	450	450	450	450	450	450
X9	Pearson Correlation	,372 <sup>**</sup>	,153 <sup>**</sup>	,134 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1,000 <sup>**</sup>	,437 <sup>**</sup>	1	,731 <sup>**</sup>
	Sig. (2-tailed)	,000	,001	,004	,000	,000	,000	,000	,000		,000
	N	450	450	450	450	450	450	450	450	450	450
TPB	Pearson Correlation	,689 <sup>**</sup>	,515 <sup>**</sup>	,618 <sup>**</sup>	,823 <sup>**</sup>	,731 <sup>**</sup>	,823 <sup>**</sup>	,731 <sup>**</sup>	,823 <sup>**</sup>	,731 <sup>**</sup>	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000	
	N	450	450	450	450	450	450	450	450	450	450

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 2. Correlation result on survey customer willingness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,742 <sup>a</sup>	,551	,550	1,15098

a. Predictors: (Constant), X

9 indicators for variable X or TPB were tested. As result in table 1 using SPSS 23, the values of R2 were 55.1% respectively as per table 2. These values provided some evidence for the closeness between design and the datas, there were relationship between indicators and variable. Reaching the significant level. Thus, the goodness of fit is satisfactory. Based on the values show in Table 1, 9 indicators had significant impacts on CW, with “sig” values equal to or less than .05. Compared with remodelling traditional houses, a stronger desire to improve

quality of life with solar houses can lead to more CW, which is consistent with findings reported for other countries and regions (Gustavsson and Ellegard, 2004; Wijayatunga and Attalage 2005; Mondal and Klein 2011; Komatsu et al., 2011b).

All Hypothesis are supported green smart power. It is clear that government roles are crucial in three respects: (1) making funding available to electrical customers via subsidies and/or loans, (2) formulating new policies to encourage solar house construction and (3) enforcing regulations. When solar houses become popular, some electricity customers may follow the trend. However, different high electricity used customer families almost have mature economic conditions and have different preferences regarding electricity capacity and financial budgeting. Therefore, the good reasons motivate them to build solar houses to cover their daily electricity needs.

## **5. Conclusions**

Among nine indicators, all had significant impacts on CW, with three being positive and two being negative. The positive factors were the desire to improve quality of life, strong government commitment and the good assessments of others, and the negative factors were large monthly expenditures and high switching costs. The four insignificant factors were durability, market maturity, popularity and timing. More empirical studies will be required to further verify the impacts of these factors on CW.

## **6. Policy implications and limitations**

The determinants of CW have important theoretical and practical implications. First, based on TPB and using a binary logistic regression model, this study predicts several key influencing factors and provides a basis for future scholarly research. Second, to convert traditional houses to solar houses, the following three aspects should be considered. First, governments should facilitate solar house planning while not directly interfering with the market. Most importantly, governments should focus on quality- assurance schemes for solar house products, the dissemination of reliable information about product performance, guidance for cost structures and financial assistance and guarantees. Furthermore, governments should provide research grants to encourage innovations in solar housing and ensure a healthy environment for solar enterprises to flourish. Second, marketing managers should focus on communities where solar houses are initially being built. To initiate a new market, a local champion who can promote the construction of solar houses among his or her neighbours should be identified and trained at the beginning. Ideally, this person should be a well-respected village leader. Furthermore, it will be important to expand local capacities once a sample house is built. Third, farmers should be active players in the conversion process to improve their living standards. There are three

limitations to this study: (1) The research only focussed on CW; (2) only nine factors were considered; and (3) the model was simple. Currently, we are developing a new research project to overcome these limitations: (1) to study the relationships between CW and customers' actions; (2) to incorporate factors that can provide a better understanding of the problems related to attitude, behaviour and barriers; and (3) to develop a complete model to explore the connections between intention and behaviour.

## Chapter 13

### Behavioral Biases in Stock Investment Decision Making of Individual Investor in Surabaya

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**Abstract** - The purpose of this paper is to empirically test the effect of loss aversion bias, optimism bias, and the status quo bias towards stock investment decisions on individual investors in Surabaya. A structured questionnaire based survey method is used to collect data from randomly selected sample of 100 individual stock investor in Surabaya. Structural Equation Model (SEM) with Partial Least Square techniques are used to investigate whether investor decision making is affected by these biases. Findings of this research show that both biases, loss aversion and optimism bias are found effect to decision on stock investment, while the status quo bias has no significant effect. Loss aversion bias is indicated on investors who will diversified the investment on several stocks, or invest in long term period due to reduce the risk of investment. The optimism bias investor tend to invest on evaluated stock. Cross tabulation of status quo bias and stock investment decisions indicates investors tend to invest of the similar stock and keep on similar portfolio. The result of this research will be helpful for brokers in securities to identify the stocks where suitable with the investor due to offering the stock investment. This research, is first of its kind which combine three different emotional biases with demography and behavioral motivations to understand how behavioral biases applied in stock investment decision-making of individual investor in Surabaya.

**Keywords:** emotional biases, loss aversion bias, optimism bias, status quo bias, stock investment decision.

#### 1. Introduction

According investment theory, investor are perfectly rational in financial decisions, but sometimes emotions and psyche influence the decisions, causing behavioral in an irrational way. Investor behavior often deviates from logic and reason. Emotional processes, mental mistakes, and individual personality trait

complicate investment decision. Behavioral Finance provides the explanation of this phenomenon. Decision making is the mental and cognitive process that results in the selection of a course of action among several alternative situations. Although emotional and cognitive weaknesses or biases affect all people but traditional finance ignores these biases because it assumes that people always make rational decisions. A large part of investing involves individual behavior (Baker and Ricciardi, 2014). The proponents of behavioral finance believe that numerous factors, including both rational and irrational thinking drive investors' behavior. They believe that investors psychology can drive market prices and fundamental value very far apart (Shefrin, 2000).

Research in psychology has documented a range of decision-making behaviors called biases. These biases can affect all types of decision-making, but have particular implications in relation to money and investing. The biases relate to how we process information to reach decisions and the preferences we have (Shefrin, 2000). Some authors refer to biases as heuristics (rules of thumb), while others call them beliefs, judgments, or preferences; still, other scholars classify biases along cognitive or emotional lines. Instead of a universal theory of investment behavior, behavioral finance research relies on a broad collection of evidence pointing to the ineffectiveness of human decision making in various economic decision-making circumstances” (Pompian 2006).

According to Pompian (2006), biases are mainly classified into two types (see table 1), emotional biases and cognitive biases. Cognitive biases involve how people think and emotional biases involve how people feel. Cognitive errors result from memory and information-processing error that is faulty reasoning. Emotional biases leads to reasoning influenced by feeling.

Table 1. Types of Biases

Emotional Biases	Cognitive Biases
1. Status Quo Bias	1. Availability Bias
2. Regret Aversion Bias	2. Framing Bias
3. Loss Aversion Bias	3. Self-Attribution Bias
4. Confirmation Bias	4. Overconfidence Bias
5. Optimism Bias	5. Cognitive Dissonance Bias
6. Self-Control Bias	6. Hindsight Bias
7. Endowment Bias	7. Mental Accounting
	8. Anchoring And Adjustment Bias
	9. Ambiguity Aversion Bias
	10. Representativeness Bias
	11. Conservatism Bias
	12. Illusion Of Control Bias
	13. Recency Bias

Source: Pompian (2006)



Emotional biases are based on feeling rather than facts. Emotions can overpower man thinking during times of stress. The emotional biases are important research bridging for investor decision making. Such decision making biases affect investor behavior and decision due to repeated occurrence of a specific set of conditions. Specifically, the decision making biases discussed widely in the literature are loss aversion, optimism, and status quo bias. This research focuses on the relationship between investors' rationality and these three proposed behavioral biases in the context of investment decision. In emotional biases is indicated bias which is have a similarity such as regret aversion bias and loss aversion bias, regret aversion is the situation when people fear that their decision will turn out to be wrong in hindsight.

This research focus on loss aversion bias with an assumption that investor who tend to have regret aversion bias certainly have fears of loss and risk, which can trigger fears of regret such as regret aversion bias. Then, endowment bias and status quo bias also have a similarity, endowment bias is the tendency of people to hold their ownership of one asset that valuable or familiar. This research also focus on the status quo bias, because people who tend to have an endowment bias certainly triggered by the tendency to not do anything or remain in the same condition or do not like the change called inertia. Inertia is a basic principle in the status quo bias theory.

Status quo bias is situation where someone tend to hold their investment without any action, or tend to hold the same position because feel comfortable with the character of the investment. On the previous research done by Ali & Ali (2014) show that investors and bankers in status quo bias when making the investment decision.

Loss aversion is the behavior of investors who prefer to avoid losses by looking for something safe and certain, even if only getting a minimum profit. Investors with loss aversion bias will tend to not take risks and will choose the benefits that would be obtained. On research which held by Ghelichi, Nakhjavan & Gharehdaghi (2016), about the investor's psychology factors to investment decision at Tehran, show the result that loss aversion have an impact to the investment decision.

Optimism bias is the tendency of investor to assume that their investment has a low risk, and also the tendency to seek the positive side of the investment without consider the negative impact of the investment. These will potentially effect to the investment decision. Another research done by Bashir, Javed, Ali, Meer & Naseem (2013) shows the influence of excessive optimism bias on

investment decision. The research found that people in Pakistan tendency to following the others perspective but on the benefit side.

Before the research, we do the initial survey through interview on 10 stock individual investor in Surabaya. The purpose of the initial survey was to investigate whether the individual investor affected by psychology factors such as those biases in making decision for their investment, particularly in stock investment. The result show that some of them quite optimize with their investment decision as a result of their own analysis. While the other investors not sure about their decision and need some recommendation from friend or the one who more professional. The remaining, prefer to choose the familiar stock or the blue chip one, since they felt more safety. This result reveal that the investor's psychology factor have the important role in their investment decision.

Based on those reason above, the main objective of this research is to test the impact of loss aversion bias, optimism bias, and status quo bias partially in stock investment decision on individual investor in Surabaya. An attempt is also made to understand the relationship between three proposed behavioral biases and investor's personal characteristics like gender, age, marital status, education, occupancy, and net income.

## **2. Research Methodology**

The study makes an attempt to verify that the individual investors may simultaneously possess complex rational and irrational thinking logics in their investment behavior. This study performs a cross-section analysis via structural equation model-partial least square (SEM-PLS) that constructs a comprehensive path to link the investors' rationality with three proposed behavioral biases. The causal processes are represented by a series of structural equations that can be modelled graphically to facilitate the conceptualization of a theoretical framework (Hair, 2010). PLS allows to evaluate simultaneously the factor loadings and error variance of the measurements and to test the significance of the relationships between the latent variables of interest.

### **2.1 Sample**

The primary data are collected by administering structured questionnaires on the active stock investors, i.e., investors who have a track record of at least five years in stock trading. This is to capture the data about the behavioral biases that exist in the minds of investors though they attempt to make rational decisions. The total sample size of 100 respondents is selected from Surabaya city. A structured questionnaire is administered on the "active investors" from Surabaya city to elicit

their responses based on a five-point Likert-type scale: strongly disagree (1) to strongly agree (5). The SEM is used to develop measurement and structural models in order to understand the relationship between investors' rationality and the behavioral biases.

## 2.2 Questionnaire

A structured questionnaire is used to collect primary information from individual investors. The items are developed for the rational decision making and three proposed behavioral biases to be studied. The questionnaire consisting of 32 items is designed keeping in view the objectives and focus of the study. The first part of the questionnaire deals with demographic factors such as the gender, age, marital status, occupation, education, income, and experience in trading (number of shares hold, investment outside of stock, and total investment other than shares). The second part of the questionnaire involves measuring the three behavioral biases, i.e., loss aversion bias, optimism bias and status quo bias. The third part involves determining rational decision making by developing items based on the existing literature. The investors' rationality is regarded as a latent variable measured by 4 observed items of questionnaire. Each behavioral bias is treated as a latent variable measured by 5-6 observed items and totally developed 21 items of questionnaire. The 21 items in the part two and part three adopt a five-point Likert-type scale to measure the psychological agreement of respondents based on the following observed variables:

### (1) Stock Investment Decision

- Investment diversification (statement no. 1 and 3)
- Consideration in making decision (statement no 2)
- Term of investment (statement no. 4)

### (2) Loss aversion

- Avoid loss and risk (Statement no. 3,4,5, and 6)
- Choose assets with low or certain returns (Statement no. 1 and 2)

### (3) Optimism

- The ability of self in conducting analysis (Statement no. 1)
- Self confidence in investments (Statement no. 2,3,4,5, and 6)

### (4) Status Quo

- Convenience in choosing investments (statement no. 2 and 4)

- Avoid changes in investment owned (statement no. 1,3, and 5)

### 2.3 Methodology

The steps that must be taken in PLS include:

- 1) Construct path diagram
- 2) Evaluation of Goodness-of-fit Outer Model
- 3) Evaluation Goodness-of-fit Inner Model

To ensure the content-related validity of items and language clarity, the questionnaire has been reviewed and tested by thirty active investors. Their opinions and suggestions were incorporated as far as possible without affecting the nature of questions. The self-report questionnaire designed by this study is utilized to collect subjective information from individual investors which might lead to face to face method.

### 3. Results and Discussion

Table 2. Demographic

Item Demographic	Description
Gender	70% male
Age	43% domination by 25 – 34 years old
Marital status	60% not married
Occupation	43% private employee
Education	73% bachelor degree
Income	39% under 10 million rupiah 37% between > 10 million rupiah – 25 million rupiah

### Diagram Path

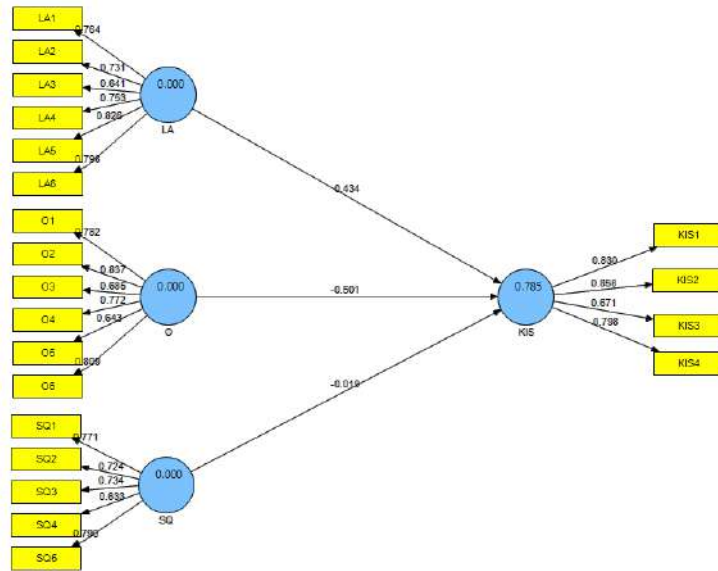


Figure 1. Outer Model

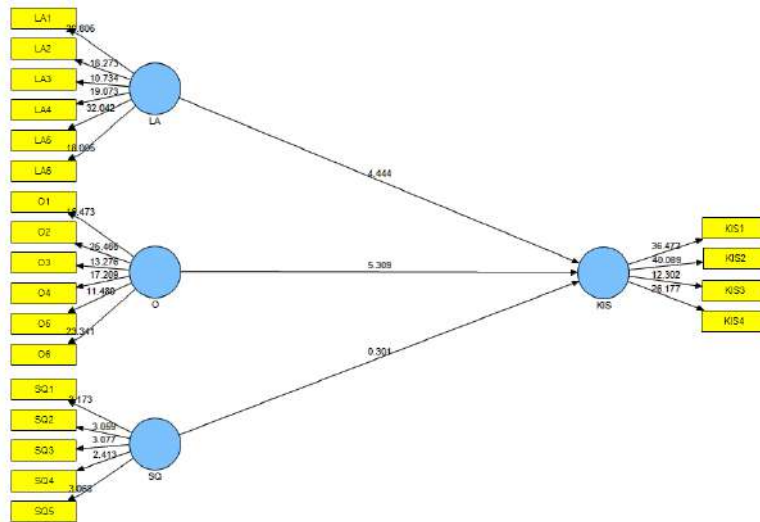


Figure 2. Inner Model

## Outer Model Evaluation

Convergent Validity, Discriminant Validity, and Composite Reliability

Table 3. Outer Loading Values

Variable	Indicator	Loading Factor
<i>Loss Aversion (LA)</i>	LA1	0,7640
	LA2	0,7308
	LA3	0,6406
	LA4	0,7525
	LA5	0,8261
	LA6	0,7980
<i>Optimism (O)</i>	O1	0,7816
	O2	0,8369
	O3	0,6854
	O4	0,7721
	O5	0,6430
	O6	0,8086
<i>Status Quo (SQ)</i>	SQ1	0,7713
	SQ2	0,7244
	SQ3	0,7338
	SQ4	0,6328
	SQ5	0,7903
Stock Investment Decision (KIS)	KIS1	0,8303
	KIS2	0,8581
	KIS3	0,6706
	KIS4	0,7979

Table 4. AVE Value

Variable	AVE
<i>Loss Aversion (LA)</i>	0,5689
<i>Optimism (O)</i>	0,5741
<i>Status Quo (SQ)</i>	0,5366
Stock Investment Decision (KIS)	0,6280

Table 5. Composite Reliability

Variable	Composite Reliability
<i>Loss Aversion (LA)</i>	0,8873
<i>Optimism (O)</i>	0,8892
<i>Status Quo (SQ)</i>	0,8520
Stock Investment Decision (KIS)	0,8701

### Inner Model Evaluation

R-Square value

Table 6. R-Square Value

<b>Endogen Variable</b>	<b>R-Square Value</b>
Stock Investment Decision (KIS)	0,7849

Q-Square value

$$Q\text{-Square} = 1 - [(1 - 0,7849)] = 0,7849$$

### Hypothesis testing

Table 7. Hypothesis Testing Result

	<b>Hypothesis</b>	<i>t</i> -statistic	<b>Conclusion</b>
1	<i>Loss aversion bias</i> (LA) → Stock Investment Decision (KIS)	4,4441	Reject $H_0$
2	<i>Optimism bias</i> (O) → Stock Investment Decision (KIS)	5,3095	Reject $H_0$
3	<i>Status quo bias</i> (SQ) → Stock Investment Decision (KIS)	0,3010	Failed to reject $H_0$

Loss aversion bias significantly influence to the stock investment decision. This is consistent with the findings of Ghelichi, Nakhjavan & Gharehdaghi (2016). Loss aversion is a bias that simply cannot be tolerated in financial decision making. It instigates the exact opposite of what investors want, there is increased risk with lower returns. Investors with loss aversion bias tend to be afraid of losses and to avoid risk. In stock investments, this type of investor will choose low-risk stocks or choose fixed-return investments. Also, investor with loss aversion bias will tend to buy various shares or to diversify shares in order to reduce the risk of holding stock. Loss aversion bias causes investors to hold shares for a longer time due to a long-term risk reduction, instead of take a cut loss action even though that is a losing stock. This is the affliction in which investors hold losing investments in the hope that they get back what they lost. This behavior has seriously negative

consequences by depressing portfolio returns. Investors will sell winners stock too early, in the fear that their profit will evaporate unless they sell. This behavior limits upside potential of a portfolio and can lead to too much trading, which has been shown to lower investment returns. Loss aversion can cause investors to unknowingly take on more risk in their portfolio than they would if they simply eliminated the investment and moved into a better one. Investors with loss aversion bias will hold unbalanced portfolio, for example, several positions fall in value and the investor is unwilling to sell due to loss aversion, an imbalance can occur.

Optimism bias significantly influence to the stock investment decision. This is consistent with the result of the research done by Bashir, Javed, Ali, Meer & Naseem (2013). Investors with optimism bias tend to believe on their efficacy, including in stock investment decision. In addition, investors who have optimism bias do not like to invest in various types of shares, investors will tend to invest in shares that have been evaluated and believed to be investors. Investors who tend to be optimistic tend to trust more information that is positive or always see the positive side. So that in a stock investment decision, investors will only believe in the advantages of a stock without thinking about the shortcomings of these shares. Optimism bias investor think they are above average investors, simply because they are optimistic people in general, or to believe that they are above average in other areas of their life. Investors with optimism bias tend to invest near their geographic region (home bias) because they may unduly optimistic about the prospect of their local geographic area.

In this research status quo bias not significantly influence to the stock investment decision. This is consistent with the result of the research done by Bashir, Javed, Ali, Meer & Naseem (2013). Investors with status quo bias tend to hold investment inappropriate to their own risk or return profiles, on the other word, by taking no action or invest too conservatively. The status quo bias investor tend to hold securities with which they feel familiar or of which they are emotionally fond. This behavior can compromise financial goals, however, because a subjective comfort level with a security may not justify holding onto it despite poor performance.

#### **4. Conclusion and Implication**

This research concluded that loss aversion bias, and optimism bias have impact on stock investor's investment decisions. While status quo has no effect on it according to given data.



It has been observed that Surabaya people mostly don't give their own opinion, they neither utilize the available resources nor the all information. The rigidity of believes found in Surabaya's people, they make their decisions following other's views instead of their own.

The data and information are very useful for investors or brokers who are basically involved in investment processes either individual or at intuitional level. The information gives help to investors (and brokers), how to make investment decision, how to take risk of investment, and how to generate portfolio of investment for achieving desired returns. The data help and give ideas to investors how to invest in particular way. The statements we make about how to invest are implication for future investment. There are different variables which are directly link with investment, so brokers also take the decision in the light of that variable. The data are useful for both individual and professional investors, as well as different types of brokers who delivers the financial services to different clients/customers. The present research highlights major biases which effects stock investment decision making.

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## Chapter 14

### Effectiveness of Chemistry Learning Through Gamification

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**Abstract** - This research aims to determine the effectiveness of using computer-assisted games as a chemistry learning media. The research was conducted on high school students in three different classes, one class as a control group and two classes as experimental chemistry groups I and II. The experimental group carried out Atomic and Molecular learning using games as learning media. Before the learning was carried out pretest, during the learning activities were observed students, and after learning was done posttest, student questionnaire and teacher questionnaire. The data obtained is compared between classes that use the game as a learning medium with classes without the use of games as learning media. The results showed that student-centered learning activities, learning outcomes in the experimental group had reached classical completeness, students gave positive responses to the use of computer-assisted games as Chemistry learning media, and the teacher stated that games could be easily used as learning media, and teachers gave responses positive for using the game as a media for learning Chemistry. There was also a significant difference between the experimental group's posttest score and the control group's posttest score. Based on these data, computerized gamification has been concluded to be effectively used as a chemical learning media. And recommend companies to produce appropriate games as a chemical learning media.

**Keywords:** games, learning media, atoms, molecules, gamification, chemistry

#### 1. Introduction

Learning media has a contribution in improving the quality of learning. The presence of the media not only helps the teacher in the learning process, but also adds value to the learning activities (Shaffer, 2004). Today the development of computers is very fast and can be utilized in the field of education. The existence of a computer as a learning media allows computer-assisted games rich in color, music / sound, and graphics can add

to the impression of realism in learning Chemistry. In addition, computers can describe abstract subject matter into a visual in the form of images or animations that will make it easier for students to understand. Computer languages can make it easier for programmers to make computer applications, so that computer-assisted games emerge as learning media. This shows the importance of using computer-assisted media in learning Chemistry.

Games are excellent methods of active learning, and their use in the chemistry classroom has been providing engaging and alternative methods of instruction and might allow students to learn in a more entertaining way compared with the traditional lecture format. The development of educational computer games can merge the educational qualities of games and attractive technologies, making the traditional chemistry teaching process become much more appealing and effective to students when permeated with interactive technological tools (Junior et al, 2016). Studies indicate that games enhance student motivation and learning outcomes significantly and have positive effects on problem-solving, achievement, interest, and engagement in task learning. When learning activities are combined with the use of games in the classroom, the combination has resulted in higher motivation or better student performance (Lima et al, 2019). There is a significant difference between student learning of organic nomenclature supplemented with the application as a complementary educational tool (EG) and traditional student learning with lectures, textbooks, whiteboards, and slideshow presentations (CG).

One type of media that can be used is in the form of a game. The game has several advantages, namely: the game can be challenging, fun, and very close to students (Prensky, 2001). Based on the result of observation around junior high school in Indonesia, it was found that 60% up to 70% of uniformed students were playing in the game center. It shows that students like playing game and as a fact that game is liked by students. According to the study conducted by Grice and Strianese (2000), there are some important features in learning environment through gamification which are providing a high level of interaction and reaction, having a specific objective and good procedure, motivating, providing the right tools and conditions that are not

boring. Education games should be effective and efficient learning strategies for teaching and learning (Petri, et al. 2016).

Gamification applies elements related to game theory and mechanics, such as the use of prizes and rewards, to increase the user engagement and motivation, in not traditionally ludic contexts. Up to now, these techniques have been successfully applied mainly in the business field, including new technologies and in mobile applications. One of the flourishing application fields of gamification in the past few years is education, shifting the passive learning process perspective, turning students into active protagonists of the process, to achieve specific goals (Carrillo, et al., 2019).

Through the game students can demonstrate the ability to overcome problems and mastery of the knowledge and skills learned (Akkuzu, & Uyulgan. 2016). The game can provide a diverse learning experience and can be used for a variety of classroom atmosphere. The game is also an effective way to get students' attention to learn certain topics or skills (Smaldino et al, 2019). Games can bring competition to students and only want to win so that they are less played as learning media.

The development of computer-assisted games has been carried out as Atom and Molecular learning media and has fulfilled feasibility, then testing its effectiveness in applying classroom learning based on student activities during learning, learning outcomes, student responses, and teacher responses. Chemistry instructors could consider integrating games into their course plans. Games have the potential to change the landscape of education as it exists. Games could move our system of education beyond the traditional disciplines, and towards a new model of meaningful learning. Games in the classroom would definitely make students more engaged in their learning. Success in the area depends on how games are used. A well developed educational games, in addition to its potential for learning and entertainment, can promote interaction between peers (Centelles & Magnieto (2014). This research aims to determine the effectiveness of using computer-assisted games as a chemistry learning media.

## 2. Method

The experiment was conducted on high school students in Surabaya, East Java, Indonesia with the subject matter of atoms and molecules using computer-based games as learning media, carried out in three different classes and different teachers. The determination of the control group and the experimental group was carried out by randomly from the population and learning in each class is done 3 three times (@ 90 minutes).

The design of the pretest-posttest control-group design study is presented below.

Control	O <sub>1</sub>	X <sub>C</sub>	O <sub>2</sub>
Experiment	O <sub>1</sub>	X <sub>ex</sub>	O <sub>2</sub>

X<sub>c</sub> = control treatment

X<sub>ex</sub> = experimental treatment

One class as a control group, carried out conventional learning without using games and two classes as an experimental class by using the game as a learning medium. Determination of the control class and experiment randomly in three schools. The game used has met the feasibility test. Before the learning was carried out pretest, during the learning activities were observed by students and after the learning was done the final test, teacher and student questionnaire.

Student activities, conducted observations of student activities during learning by using computer-assisted games as learning media. Teacher questionnaire in the form of teacher responses to the use of games as a medium of chemical learning and student questionnaires about responses to chemical learning by using computer-assisted games as learning media. The pretest and posttest are used to measure the success of learning outcomes by using the game as a medium of play. Learning activities are declared

effective if: (a) student activities reach frequent categories, (b) learning outcomes have achieved classical completeness, experimental group learning outcomes are better, (c) students give positive responses, (d) teachers provide positive responses to the use of games as a chemical learning media.

### 3. Result and Discussion

#### 3.1 Student Activities

Observations on student activities during learning by using computer-assisted games as Atom and Molecular learning media are carried out by 2 observers who have been trained first, the results of observing student activities with a scale of frequency assessment of student activities are presented in Table 1.

**Table 1. Observation Results of Student Activities**

Observed Aspects	Control Group		Experiment Group I		Experiment Group II	
	P 1	P 2	P 1	P 2	P 1	P 2
AQ - asking questions	4	4	4	4	3	3
GI- giving input on the problem being presented	3	3	3	3	3	3
FN - Find something new (different)	2	2	3	2	2	2
TCT - Try challenging tasks	2	3	2	3	3	3
EA - Explain answers found to other friends	2	2	2	2	3	3
WC - Willingness to come to the front of the class	2	2	2	2	2	2
QRC - Questioning the results of the teacher or student's work and comparing them with their own answers	2	2	2	2	3	3
Total	17	18	18	18	19	19
Average	2,50		2,57		2,71	

Note

P 1 – Observer 1; P 2 – Observer 2

The results above show student activities reaching 2.50 to 2.71 in the frequent category, which is greater than 2.40 and  $\leq 3.20$ , meaning that during learning can make students active during learning, but the experimental group is higher in activity.

In the three groups, the biggest activity was asking questions (AQ), giving input on the problem being presented (GI), and finding new / different things (FN). This means that during learning students dare to ask questions and express opinions. Low activity on the ability to appear in front of the class, this can occur because students are more active in their seats by running the computer.

These results are in accordance with the results of research by Rastegarpour & Marashi (Rastegarpour & Marashi, 2012) in class games can make students more involved in learning and support student activities in learning. Games developed as learning media will add to the potential for learning and entertainment, can also encourage interaction between friends (Agarwal & Saha, 2011).

### 3.2 Learning Outcomes

The learning outcomes test is conducted before (pretest) and after learning (posttest), the results obtained are presented in Table 2 below.

**Table 2. Learning Outcomes of Control Group Students**

Test	Number of Students	Complete	Score (max. 100)		sig	Average	df	Value of t
			Lowest	Highest				
Pretest	30	3.33%	3.33	80	0.250	27.86	29	12.65
Posttest	30	20.0%	56.67	90	0.108	71.51		

Individual student mastery learning or minimum completeness criteria (KKM) is used 75. In the control class the learning outcomes test after learning has been completed 20.0% of 30 students, means that it has not met the criteria determined to be said to be ineffective, these results illustrate that using conventional learning media available in the classroom cannot help achieving student learning completeness.



If based on the increase in the average score of the initial test and the final test, a paired t-test will be conducted, first a normality test will be carried out and a t-test will be conducted in pairs with the SPSS program. Normality test with Kolmogorov-Smirnov Test, the price of the initial sign test is 0.250 and the price of the final sign test is 0.108, the price is greater than 0.05 means the initial test score and final test score are normally distributed.

The results of the test differences in the average pretest score and the posttest are obtained as Table 2.

The value of t count 12.65 is in the rejection area of Ho, meaning that Ha is accepted which shows there is a difference in the average score of the initial test and the final test. The above results show that learning Atom and Molecules using existing media in the class can significantly improve the initial test scores with the final test, but have not yet achieved classical completeness.

In experimental group I and experimental group II using computer-assisted games as learning media the results obtained as Table 3 below.

**Table 3. Learning Outcomes of Student Experiment Group I & II**

Score	Number of Students	Complete	Score (max. 100)		sig	Average	df	Value of t value
			Lowest	Highest				
Pretest EG I	31	3.3%	3.3	80	0.121	28.69	30	15.440
Pretest EG I	31	87.0%	50	100	0.097	82.56		
Pretest EG II	31	0.3%	3.3	80	0.252	27.725	30	17.476
Posttest EG II	31	96.7%	70	100	0.400	85.142		

The results above show the final test score has passed the specified criteria (80%), which has reached 87% classical completeness. The price of the initial test score is 0.121 and the price of the final test score is 0.097, both 0.05, meaning that they are normally distributed.

To test the differences in the average score of the initial test and the final test in the experimental group I, the t test was paired with SPSS version

16, the normal distribution requirements were met and the following results were obtained.

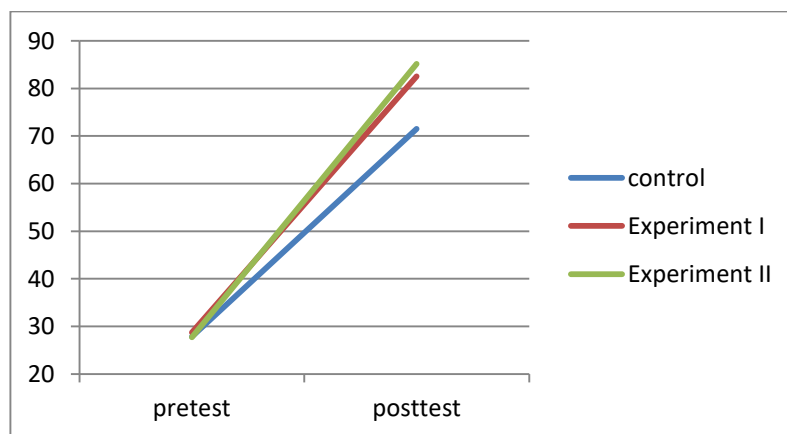
Value of  $t$  is 15.44 and  $t$  table is 2.04 which means that  $t$  count is in the rejection area of  $H_0$ , meaning  $H_a$  is accepted, meaning there is a significant difference between the average initial and final test scores in the experimental group I at a significance level of 5%.

Scores of student learning outcomes before and after learning the experimental class II are presented in Table 3.

The value of the sign obtained in the initial test is 0.252 and the final test is 0.400, the price is greater than 0.05, meaning that the initial test and final tests are normally distributed and can be paired with  $t$ -tests.

Value of  $t$  shows 17.476 in the rejection area  $H_0$  means  $H_a$  is accepted, meaning that there is a significant difference between the average score of the initial test and the final test score. And if examined the student learning outcomes after learning shows that it has reached more than 80% complete so that it has fulfilled classical completeness.

The result of pretest and posttest between control group and experiment groups are shown in Figure 1.



**Figure 1. Score Control Group and Experiment Groups**

Based on Figure 1, there is an increase of three groups from the average score of pretest to the average score of posttest. However, the higher increase happens in experiment groups

Next, compare the average score of the final control class with experimental groups I and II. Because the final test score of the three groups has a normal distribution, it is fulfilled to do an independent t test.

**Table 4. Independent t Test Results Final Test Score**

Group	df	t count	t table (5%)	Conclusion
Control – experiment I	59	4.192	2.00	Ho rejected
Control – experiment II	59	6.560	2.00	Ho rejected
Experiment I – experiment II	60	1.013	2.00	Ho accepted

Based on Table 4, shows the average score of the control group posttest with the experimental group I there was a significant difference, the average score of the control group posttest with the experimental group II had a significant difference, and the posttest average score between experimental group I and experimental group II showing no difference. This means that the experimental group achieved better results than the control group, the experimental group had achieved classical completeness, and the average posttest score of the two experimental groups had significant similarities.

These results are consistent with the results of Agarwal & Saha (2011) study on chemistry learning using computer-propelled games, students obtain an average yield of 4.1 or 82%. And this result is in accordance with the results of several studies which state that the game is good for learning (Shaffer, 2004; Shaffer, Squire, Halverson, & Gee, 2008). Other researchers also stated that games can significantly improve learning outcomes (Cordova & Lepper, 1996).

The game also has a positive effect on problem solving, achievement in learning (Kim, Park, & Baek, 2009). Games when used properly can be a useful tool in learning the concepts of Chemistry/Science (Bolinggi, 2009; Chua, 2005). Activities in the game provide more training in intelligence, through sound, images, linguistics, kinesthetic, interpersonal,

and intrapersonal intelligence (Boot et al. 2008). Likewise, the results of Rastegarpour and Marashi (2012) study showed that there were significant differences in the scores of learning outcomes between the experimental group and the control group, during which classroom learning could make students involved in learning, and success depends on how the game was used.

### 3.3 Questionnaire for student responses

The questionnaire statement consists of positive statements and negative statements. The results of the questionnaire about students' responses to Chemistry learning by using computer-propelled games as learning media are presented in Table 5. The lower the scores obtained indicate students are increasingly disliked.

**Table 5. Results of Questionnaire of Control Group Students**

Number	Statement	Score
1	I feel that learning Chemistry with the media has become easier	15 (50.00%)
	After learning Chemistry with the media, I became more happy with Chemistry	10 (33.33%)
	I want to study Chemistry again with the media	13 (43.33%)
	If it's permissible, I want to bring the media home to study at home	10 (33.33%)
	I want to tell friends or parents about learning Chemistry.	8 (26.70%)
2*	I felt that learning Chemistry was too long.	7 (23.33%)
	I feel that studying Chemistry with the media was boring.	6 (20.00%)

Number	Statement	Score
	I want to study Chemistry with the media immediately stopped.	5 (16.70%)

These results show the score of the control group questionnaire obtained 5 (16.70%) to 15 (50%), indicating that students did not give a positive response to the conventional learning that had just taken place. The lowest score (16.70%) states that learning chemistry was immediately stopped, meaning that students do not like conventional learning with the media available in the class. Likewise the conventional learning statement is boring and feels too long, students give low scores, this means students feel bored and hope to end soon.

The results of the student responses questionnaire on learning Atom and Molecules in the experimental groups I and II are presented in Table 6 below.

**Table 6. Results of Student's Questioner**

Number	Statement	Score	
		Group Experiment I	Group Experiment II
1	I feel that learning Chemistry with the media has become easier	30 (96.7%)	30 (93.75%)
	After learning Chemistry with the media, I became more happy with Chemistry	29 (93.5%)	30 (93.75%)
	I want to study Chemistry again with the media	31 (100%)	32 (100%)
	If it's permissible, I want to bring the media home to study at home	30 (96.7%)	29 (90.6%)

Number	Statement	Score	
		Group Experiment I	Group Experiment II
	I want to tell friends or parents about learning Chemistry.	29 (93.5%)	28 (87.5%)
2*	I felt that learning Chemistry was too long.	31 (100%)	30 (93.75%)
	I feel that studying Chemistry with the media was boring.	30 (96.7%)	30 (93.75%)
	I want to study Chemistry with the media immediately stopped.	30 (96.7%)	31 (96.88%)

Note: \* Negative Statement

In the experimental group I, the smallest score was 93.5% so it had reached the minimum limit (75%), while the highest score reached 100%. The results of this student questionnaire can be said that learning by using computerized games gets a positive response fulfilling. In the experimental class II the answers to the questionnaire above show that students gave a positive / agreed response to the use of the game as a learning medium, it reflected a score obtained from 87.5% to 100%.

The results of the questionnaire showed students studying Chemistry felt facilitated by using computer-assisted games as learning media, adding learning skills, becoming learning Chemistry was fun, not boring, and wanted to learn again by using computer-based games as learning media.

Computerized gaming integrated with student learning experiences can have a positive impact on learning motivation, provide a richer learning experience, and maintain learning motivation (Inal & Cagiltay, 2007) even errors in the game also allow students to reflect and reuse play strategies to improve knowledge and motivated to try again (Sweester & Wyeth, 2005).

### 3.4 Teacher's response

The teacher's response was to get a response to the use of computer-assisted games as a media for learning chemistry in the classroom. The results of responses by the teacher are presented in Table 7.

**Table 7. Results of Teacher's Response to the Use of the Game**

Aspect	Indicator	Rating result		Average	% Achievement
		G1	G2		
Easy to use game	1. Easy to use	5	5	5.0	100
	2. There are choices/alternatives in playing.	5	4	4.5	90.0

Note

G1 – Teacher1; G2 – Teacher 2

The results of the calculation of the ease of use aspect score obtained a score of 4.5 and 5.0 with an average score of teachers of 4.75, meaning that the teacher judged the game as an easy-to-use game for learning Chemistry.

The questionnaire answers given to the two Chemistry teachers who taught in the experimental class are summarized below.

- (a) The teacher, there are no difficulties while using the game as a learning media.
- (b) The teacher suggests that the game be used as a learning media, because in the game there is material and can be described in detail.
- (c) The teacher believes that it is necessary to continue the use of games as a media for learning Chemistry, because it will provide new insights / atmosphere and stimulate teacher creativity in teaching and students in learning.
- (d) Chemistry learning atmosphere is felt by students more motivated to find their own information in the game and motivated to play while learning.

- (e) The teacher's opinion about the game as a chemical learning media, stated to be very good and good, because it is an alternative learning and playing for children and hopefully children can avoid games that are not educational.
- (f) The teacher hopes that there will be a game program for other Chemistry topics and in other classes.

The results of this questionnaire can give an idea that the teacher is happy with the computer-based game as a media for learning Chemistry and finds it difficult to make it himself because he is busy but will use it when it is available.

These results show that during the learning fun of students and making the learning atmosphere happy, it does not mean creating a noisy atmosphere, this is in accordance with the opinion of Meier (2000) about the use of games as a learning medium. Excitement here means the rise of interest is full involvement, and the creation of meaning, understanding (mastery of matter), and happy values for the learner.

These results are consistent with the results of previous studies, that games in the classroom can be ascertained that students are more enthusiastic about learning (Rastegarpour & Marashi, 2012), and can provide learning motivation (Kearnnet & Pivec, 2007; Lutfi, 2013). The game can significantly increase the motivation of students to learn (Cordova & Lepper, 1996), as well as the results of other studies stating the game can increase motivation and student learning enthusiasm in the learning process so that the learning process becomes more enjoyable (Virvou et al., 2005). While the game can also attract and entertain players at the same time (Kiili, 2006). When students are familiar with playing the game, students are eager to complete (Agarwal & Saha, 2011). Educators are looking for games to complement classroom learning, game developers make games for learning media, all need to be involved which can enable emotional or child development to make games as learning media (von Salisch, Oppl, & Kristen, 2006). Most of the men and women to overcome boredom or fatigue by doing games (Olson et al., 2007), play that overflows all emotions / fatigue (Olson et al., 2008). Squire and Barab (2004) found that playing games in learning increased interest in learning (Shaffer, 2004; Shaffer et al, 2008).



Students who learn with computer-assisted games can show better visual, psychomotor, and affective abilities (Aguilera & Mendiz, 2003), while other studies that obtain results from students studying with simulation games can better master abstract and conceptual knowledge related to electromagnetism (Squire et al., 2004). This shows a good game for science learning.

According to Norman (2003) the computer game has fulfilled the requirements as a learning medium that can create an effective learning environment, and the results above also show that the game that has been developed has succeeded in creating active students and motivates students to continue learning. Through learning with computer-propelled games as learning media allows students to build knowledge from ambiguous, trial and error and become new knowledge (West & Ross, 2002). This is consistent with Piaget's fundamental insight that individuals construct their own understanding; learning is a constructive process. Vygotsky believed that cultural tools including computers played a very important role in cognitive development. Constructivism argues that students can construct or construct their own knowledge with active processes of students and utilize learning resources in a variety of ways, and provide opportunities for students to collaborate (Mustadji, 2005), these activities are in computer-assisted games.

Learning by using games as learning media can be used to provide a rich learning environment to help learners build higher level knowledge and skills through ambiguous, challenging, and opportunities (Van, 2007). During play students engage in high-level cognitive activities to encourage attention, activity and retention by trial and error (Pivec & Dziabenko, 2004). The results of the questionnaire above show that the game has good learning media criteria (Mulyanta and Marlon, 2009), which means that the game developed provides students with easy learning and makes the learning easy to understand, learn, and understand; provide student attractiveness both appearance, color choice, and content; having benefits means that the game contains benefits for understanding the material; and has a match with student learning needs.

#### 4. Conclusions

Based on data analysis and discussion it can be concluded that the use of computer-assisted as a chemical learning media can be carried out effectively based on the following indicators.

- a. Student activities during learning with games as learning media reflect more student-centered learning.
- b. Student learning outcomes, the experimental group achieved mastery learning and the posttest score of the experimental group was better than the kelompok control score.
- c. The response of students, the experimental group gave a positive response to the use of the game as a media of learning Chemistry and expressed pleasant learning.
- d. The teacher's response, stating Chemistry learning using games as learning media can help implement learning according to plan and make learning Chemistry enjoyable.

#### 5. Recommendations

The use of computer-propelled games as learning media Chemistry that has gone through feasibility tests can be used as an alternative teacher as learning media so that student-centered learning activities will be obtained, achieving mastery of learning outcomes, teachers can carry out learning according to plan, and can create students feel fun during learning. And recommend companies to produce appropriate games as a chemical learning media.

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## Chapter 15

### **Green Supply Chain Management Determining Organizational Performance: Some Evidence from Food and Beverage Small Medium Enterprises in Indonesia**

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**Abstract** - Green Supply Chain Management (GSCM) is an operational initiation to overcome environmental issues generally faced by many organizations including Small Medium Enterprises. This study aims to determine how Green Supply Chain Management associated with the industrial environment and organizational performance of Small Medium Enterprises in East Java Province, Indonesia. A survey was carried out to 76 respondents from the East Java Food-Beverage Association. Variables studied were the industrial environment, GSCM, organizational performance, and decentralization moderation on GSCM to organizational performance. Data were analyzed using Partial Least Square. In this paper the authors have proven that the industrial environment significantly influenced organizational performance. However, it did not influence significantly to GSCM nor GSCM influence organizational performance. Also, decentralization was unable to moderate the influence on the industrial environment to organizational performance. The current paper is an attempt to expand the previous work based on contingency theory. The centralized authority on SMEs needs further studies given the rapid environmental changes certainly requiring an immediate response to anticipate the market changes. In addition, further studies need to be conducted especially on how decentralized organizational structure on SMEs in many foreign countries or in the foreign-owned companies.

**Keywords:** Organizational performance, Green supply chain management, Industrial environment, Decentralization

## 1. Introduction

Household consumption expenditure in Food and Beverage Consumption Expenditure except restaurants in East Java has the largest contribution (BPS-Statistics Indonesia, 2019). Imported food products are very intensively entering the Indonesian market and this makes it a challenge for local products to increase their competitiveness amid increasing regional trade. It cannot be denied that Small Medium Enterprises (SMEs) has played an important role in the economy of various countries (Akinboade, 2015; Alfoqahaa, 2018; Tambunan, 2011).

SMEs as an open system organization definitely relate to the environment. As a part of organizations, SMEs should be able to adapt with various changes of specific mechanisms within and outside the organization, especially the environment. Environment not only becomes sources but also provides plausible uncertainty. The environment influences management and strategy (Mason, 2007). In a challenging environment, companies employ the radical, fast, and perhaps even disruptive strategies. Thus, the strategies made should be democratic with bottom-up processes and organic structures as well as it should independently organize and be adaptive meaning that company becomes more decentralized. On the other hand, in a mild environment, companies employ more formal and traditional management and strategic planning strategies (mechanistic and centralized) meaning that organizational design in form of centralization or decentralization will reduce or increase the success in managing the environment. A study shows that the organizational structure of which is measured by decentralization has a significant effect on organizational performance (Hao et al., 2012). The same opinion states that organic organizational structure is positively related to performance management (Wadongo and Abdel-Kader, 2014). In contrast, a study showed that organic structures were negatively associated with performance (Jogarotnam and Ching-Yick Tse, 2006). Another study states that decentralization was not proved to moderate the influence of the environment on organizational performance (Witjaksono and Rahmadyanti, 2014). To overcome this gap, the contingency approach is considered appropriate as the grand theory. Contingency (uncertainty) or limited resources will confront the form of an organizational design. Contingency approach is a management approach to designing organizational structures that must be in accordance with the limited resources faced by the organization (Jones, 2004).

Many restrictions relating to environmental issues imposed by developed countries hinder the market growth especially to the SMEs actors in developing countries because mostly, business actors in developing countries less aware on the environmental impact of their industrial activities. In one side, local raw

materials used by SMEs are advantageous because they reduce the dependence on the export raw materials, represent the uniqueness, as well as increase the profit. However, utilizing natural resources without environmental management results on the susceptible of SMEs to environmental damages (Jansson et al., 2017; Nulkar, 2014; Shah et al., 2016). Potential SMEs strategies in advancing the economic growth also highly impact to environmental damages and it challenges the nation to develop SMEs to the sustainable development program. Lack of knowledge, equipment, and capital causes most SMEs have low awareness in environmental management. Therefore, implementing environmental management on SMEs still becomes one of the biggest challenges for the government especially in designing strategies and approaches.

One of the internationally recognized and emerging strategies for environmental management studied and discussed is cleaner production. Cleaner production is the best integrated and sustainable prevention strategy supporting sustainable development (Tseng et al., 2006) because it gives attention to the stages of production in meeting environmental issues (Calia et al., 2009). This concept controls the stages of production, raw material consumption, energy consumption and industrial waste (Ribeiro Massote and Moura Santi, 2013). Cleaner production is designed to prevent or reduce waste and emissions at its source to improve the environment as a form of economic performance from organizational participation. Implementing cleaner production provably has a positive impact on organizational performance (Zeng et al., 2010). Organizations involved in environmental management will have an impact on changing business performance (Jabbour et al., 2012). It is proved that proactive efforts in environmental management are positively related to financial results and greater operational efficiency (Ahmad and Schroeder, 2003). In addition, companies gain additional value in marketing when they adopt environmental management systems and integrate them with organizational functions and produce better marketing performance, improve imaging, reduce risk and gain greater efficiency (Wagner, 2007).

Green Supply Chain Management (GSCM) which is a broader concept than cleaner production, a form of operational initiation to address environmental problems carried out by many organizations in the Southeast Asia region (Rao and Holt, 2005). GSCM implementation can be either soft GSCM or GSCM hard, where technology for cleaner production is included (Dubey et al., 2017). Therefore, for future researches, involving environmental uncertainty, product complexity, and organization size as research variables/factors is important. Prior studies (Vijayvargy et al., 2017) show that organization size has a significant impact on adopting GSCM implementation in India. Finally, through a very in-



depth meta-analysis in Asian emerging economies (AEE), GSCM practices lead to better performance in four aspects: economic, environmental, operational, and social performance (Geng et al., 2017).

Referring to prior studies and researches, implementing cleaner production, which expands to GSCM, has impact on competitiveness and contributes to sustainable development program. Therefore, in developing the competitiveness of food-beverage SMEs especially to face global market, a study addressing to these issues should be preferred especially regarding the strategy to assist and implement GSCM in SMEs and its influences to the organizational performance. Specifically, this study conducted on food-beverage SMEs in East Java aims to 1) examine the influence on industrial environment to organizational performance of SMEs; 2) examine the influence on industrial environment to GSCM implementation; 3) examine the influence in GSCM implementation to organizational performance of SMEs; and 4) examine the effect of decentralization moderation on the organizational performance of SMEs.

## **2. Literature review**

### **2.1. Linkage between Industrial Environment and organizational performance**

Outside forces, such as competitors, suppliers, and corporate customers, continue to shape the external environment in which the industry and competitive analysis frameworks are popularized by Michael Porter (Chevalier-Roignant and Trigeorgis, 2011). External opportunities and external threats refer to economic, social, cultural, demographic, environmental, political, legal, governance, technological, and competition trends and events that can significantly benefit or disadvantage the organization in the future (David, 2011). Environmental performance as one dimension of corporate social responsibility, has been proven to have a positive impact on economic performance in Australia (Sila and Cek, 2017). Customer pressure as an external environment has a positive effect on the implementation of customer-centric GSCM, which, in turn, leads to multiple operational performance improvements (flexibility, delivery, quality and cost performance) (Chavez et al., 2016). Based on these studies, the hypothesis proposed is:

*H1. Industrial Environment influences the Organizational Performance.*

## **2.2. Linkage between Industrial Environment and GSCM**

Research conducted by (Ouyang et al., 2018), examines the impact of institutional environments on environmental management EM. The result show items such as government enforced regulation has no effect on EM, government supportive policy, industry standards, and Competitors' EM practices have a positive effect on EM, suppliers' EM expectations, and consumers' EM expectations has no effect on EM, EM's Community expectations, investors' EM expectations, and EM Employees' expectations have a positive effect on EM. Some environmental factors that affect the implementation of green supply chain management include government green-related regulations, pressure from supply chain stakeholders, pressure from competitors, pressure from end-consumers, environmental commitment, enter foreign markets (Balasubramanian and Shukla, 2017). Another studies show that external factors such as customer management, regulatory, supplier management, social, and competitiveness, are also the determining factors in the successful implementation of GSCM (Luthra et al., 2016). Customer pressure also has a positive effect on the implementation of customer-centric GSCM (Chavez et al., 2016). So, the hypothesis proposed is:

*H2. Industrial Environment influences the GSCM.*

## **2.3. Linkage between GSCM and organizational performance**

Several recent studies on green supply chain management found that environmental aspects of the supply chain have become the focus of researchers and academics. The study conducted by (Younis et al., 2016) shows that GSCM practices impact the CP dimensions differently. While none of the four GSCM practices were found to have any impact on the environmental performance, green purchasing and environmental cooperation were found to have a significant impact on the operational performance. The study also found that only green purchasing plays a role in improving the economic performance, while only reverse logistics practices were found to impact the social performance of the firm positively. The adoption of GSCM practices by manufacturing organizations leads to improved environmental performance and economic performance, which will a positive impact on operational performance that can improve organizational performance (Green Jr et al., 2012). The implementation of green practices has had a positive impact on the environmental, economic, and organizational performance for all stakeholders, while the extent of the green practices implemented depends on the relative strength of the drivers and barriers (Balasubramanian and Shukla, 2017). However, a study examining the direct effect between GSCM practice implementation and business performance, no significance was found (Lee et al.,

2012). The measurement of the comprehensive implementation of GSCM was carried out by (Vijayvargy et al., 2017) with 21 items. Based on some theoretical studies above, so the hypothesis proposed is:

*H3. GSCM influences the Organizational Performance.*

#### **2.4. Decentralization moderates the influence of the industrial environment on organizational performance**

A study examining the relationship between entrepreneurial orientation organization structure and performance in the Asian hotel industry, shows that entrepreneurial strategic posture is positively associated with performance. But instead, organic structures were negatively associated with performance (Jogaratnam and Ching-Yick Tse, 2006). This raises further questions because many studies show that organic organizational structures, usually have a positive relationship on organizational performance (Hao et al., 2012; Wadongo and Abdel-Kader, 2014). This gives rise to conjecture whether the decentralized organizational structure design can moderate the influence of the industrial environment on organizational performance. Based on that, the hypothesis proposed is:

*H4. Decentralization moderates the influence of the industrial environment on organizational performance.*

### **3. Method**

From its approach, this study is quantitative study due to hypothetical testing, calculation importance (for quantitative data, numbers) through statistical testing, as well as the focus on the events and relationship among variables. Moreover, it also qualitative study due to in describing the statistical testing results, data were analyzed qualitatively to describe the situation through descriptive analysis and information importance.

Based on data collection technique, this study was survey study meaning that the study was conducted by collecting part of population as sampling or all unit population to be observed through interviews and questionnaires as data collecting instruments. Based on the capability of researchers to provide impacts on variables observed, this study considered as ex post facto because it is not experimental and the study was conducted in the field not in the laboratory. This study also aims to provide the explanation on the causality relationship among variables through hypothetical testing, so it considers as explanatory research with analytical technique of confirmatory factors.

Data used in this study were both primary and secondary data. Primary data were obtained from observation. The survey employed delphi method and interview to the Association of Food-Beverage Industry of East Java Province and Food-Beverage SMEs. Secondary data were obtained from Central Statistical Bureau. This study involved 2 students as well.

Population was Food-Beverage SMEs in 38 regions in East Java province. Sampling was taken for hypothetical testing with purposive sampling technique. Data were obtained through direct observation by visitation to related SMEs. Hence, 76 respondents were obtained.

Exogen variables are unpredicted variables of others, so this study occurred an exigent variable which is industrial environment. GSCM variable is independent variable to organization performance, but it becomes dependent variable to industrial environment. Moderator variable in this study was decentralization, while GSCM and organizational performance became endogen variable as well as dependent variable due to its predictability on other variables.

### **3.1. Industrial Environment**

It is an external factor directly influencing to Food-Beverage SMEs industrial activities in East Java Province, including new coming of similar products, buyers, suppliers, substitutes products, as well as competition of industrial actors. Indicators with items are (Pearce II and Robinson, 2003):

1. Threat of new comers.
2. Consumer buying level.
3. Supplier strength.
4. Threat of substitute products.
5. Competition of industrial actors.

These indicator items were measured into 5 Likert scale as 5 (very high), 4 (high), 3 (moderate), 2 (low), and 1 (very low). For the second and third indicators, score was inversing meaning that the higher the score is, the higher industrial environment influences to the company.

### **3.2. Green Supply Chain Management Implementation**

It is an organizational philosophical implementation, which gives competitive advances to the organization in term of high product quality, high service quality,

minimum waste, zero pollution, better image, and high return investment. Indicators describe into items as (Vijayvargy et al., 2017):

1. Acquiring certification quality of ISO 1400.
2. Existence of environmental management system.
3. Compliance and environmental audit program.
4. Total quality environmental management.
5. Cross-functional company for environmental improvement.
6. Support for GSCM implementation from intermediate level of managerial.
7. GSCM commitment from senior managers.
8. Cooperation with suppliers for environmental purposes.
9. Environmental audit to the supplier internal management.
10. Giving design specification to suppliers including the environmental requirement for material bought.
11. Supplier with ISO certificate 14001.
12. Suppliers evaluation for second level of environmentally friendly.
13. Cooperation with consumers for eco-design.
14. Cooperation with consumers for cleaner production.
15. Cooperation with consumers for green packaging.
16. Low consumed energy of product designs.
17. Reuse, recycle, and recovery materials as well as components of product designs.
18. Product design to avoid or reduce dangerous substance usage in product and in production process.
19. Investment return (selling) excessive supply/material.
20. Selling waste and remaining materials.
21. Selling excessive capital equipment.

These indicator items were measured into 5 Likert scale as 5 (actively implemented), 4 (implemented), 3 (moderately implemented), 2 (rarely implemented), and 1 (not implemented). For the second and third indicators, score was inversing meaning that the higher the score is, the higher industrial environment influences to the company.

### **3.3. Decentralization**

It is a variable indicating the dominant decision makers in issuing strategic policies in Food-Beverage SMEs in East Java Province. The items described as (Germain and Spears, 1999):

1. The most dominant decision makers in the product produced/manufactured.

2. The most dominant decision makers in deciding manufacture location.
3. The most dominant decision makers in the number of warehouses.
4. The most dominant decision makers in deciding warehouse location.
5. The most dominant decision makers in deciding technique/method for production process.
6. The most dominant decision makers in hiring labors.
7. The most dominant decision makers in deciding supplier.

Those sevens use to measure the decentralization level from 1 to 7 scale to refer the level from low to high respectively.

### **3.4. Organizational Performance**

Organizational performance is the performance level achieved by Food-Beverage SMEs in East Java Province to obtain its goals. In this study, organizational performance includes financial and non-financial performances. This performance was measured through indicators as:

1. Unit production costs.
2. Fast delivery.
3. Flexibility.
4. Cycle time.
5. Design quality.
6. Manufacturing quality.
7. Customer satisfaction.
8. Employee satisfaction.
9. Market share.

These items scaled from 1 to 7 where the increasing number represents the increase organizational performance respectively (Martinez-Costa and Martínez-Lorente, 2004).

Analysis technique used was PLS method where the data did not represent certain scale; direction of causality relationship (from latent variable to indicator) or formative relationship (from indicator to latent variable); as well as number of sampling (from 30-100 cases).

## 4. Results and Discussion

### 4.1. Results

Subjects observed were food and beverage SMEs in East Java. The respondents were grouped based on their products (see Table 1).

Table 1. Respondent profile based on main product and business length

Main product	Business length (Year)			Total
	1-5	5-10	> 10	
Crackers	8	6	0	14
Tape (fermented cassava)	0	2	0	2
Coffee	1	5	1	7
Stick	2	2	0	4
Chocolate	1	0	0	1
Chips	5	5	1	11
Fruit juices	2	6	2	10
Processed banana (jam and <i>Gethuk</i> )	3	5	0	8
<i>Jenang</i> (gelatine)	1	5	0	6
<i>Pia</i> (pie)	0	2	0	2
Tofu and Tempe	0	1	0	1
Fresh milk	0	1	0	1
Salted egg	1	1	1	3
Tea	0	1	0	1
Peanuts	0	2	0	2
Sweets and <i>Nata</i>	0	2	0	2
<i>Abon</i>	0	1	0	1
	24	47	5	76

Table 2. Respondents characteristics based on age and education background

Age (Year)	Education Background				Total
	<= Elementary School	Junior High School	Senior High School	University	
30-40	3	19	19	11	52
> 40	0	6	11	7	24
Total	3	25	30	18	76
	3.95%	32.89%	39.47%	23.68%	100.00%

Respondents in this study are owners/managers of food-beverage SMEs in East Java province. If there are two or more respondents in one company, the score is obtained by calculating the average score of the company/SMEs. Answers used in analysis are taken from 76 respondents of 76 SMEs observed. Table 1 and Table 2 show the answer of 76 respondents. Table 2 shows that respondents aged from 30 to 66 years and the highest is in the age range of 30-40 years. From educational background, 39.47% of respondents were senior high school graduates; 32.89% were junior high school graduates; 23.68% university graduates; and 3.95% were elementary school graduates.

Research variables can be described through descriptive analysis in form of frequency and statistics tables, including minimum score, maximum score, average score, and deviation standards in which summarized into the descriptive analyses of indicators (see Table 3).

Table 3. Respondent Scores



	Valid	Missing	Mean	Std. Deviation	Minimum	Maximum	Sum
*EI_1	76	0	3.74	.822	2	5	284
EI_2	76	0	3.95	.878	1	5	300
EI_3	76	0	3.88	.816	2	5	295
EI_4	76	0	3.93	.838	2	5	299
EI_5	76	0	3.76	.922	2	5	286
EI_TOT	76	0	3.8526	.56415	2.40	5.00	292.80
*GSCM1	76	0	1.68	.496	1	3	128
*GSCM2	76	0	1.76	.608	1	3	134
*GSCM3	76	0	1.47	.503	1	2	112
*GSCM4	76	0	2.37	.538	1	3	180
*GSCM5	76	0	3.13	.718	1	4	238
*GSCM6	76	0	3.84	.865	2	5	292
*GSCM7	76	0	4.12	.632	2	5	313
*GSCM8	76	0	3.07	.899	2	5	233
*GSCM9	76	0	3.33	.958	2	5	253
*GSCM10	76	0	4.63	.486	4	5	352
*GSCM11	76	0	3.11	.759	2	5	236
*GSCM12	76	0	4.37	.709	3	5	332
GSCM13	76	0	4.18	.743	3	5	318
GSCM14	76	0	4.45	.737	2	5	338
*GSCM15	76	0	3.87	.789	3	5	294
*GSCM16	76	0	3.87	.789	3	5	294
GSCM17	76	0	4.36	.962	2	5	331
*GSCM18	76	0	3.70	1.286	1	5	281
GSCM19	76	0	4.28	1.066	2	5	325
GSCM20	76	0	3.74	.755	2	5	284
*GSCM21	76	0	4.25	.926	2	5	323
GSCM_TOT	76	0	3.5030	.28841	2.76	4.05	266.23
DES1	76	0	3.59	.819	2	5	273
DES2	76	0	3.83	.806	2	5	291
DES3	76	0	3.86	.778	2	5	293

DES4	76	0	3.92	.845	2	5	298
DES_TOT	76	0	3.7993	.53232	2.75	5.00	288.75
OP1	76	0	3.87	.838	2	5	294
OP2	76	0	3.70	.849	2	5	281
OP3	76	0	3.67	.915	2	5	279
OP4	76	0	3.58	.970	2	5	272
OP5	76	0	3.33	.737	2	5	253
*OP6	76	0	3.12	.765	2	5	237
OP7	76	0	3.97	.848	2	5	302
OP8	76	0	3.96	.824	2	5	301
OP9	76	0	3.84	.784	2	5	292
OP_TOT	76	0	3.6711	.46841	2.67	4.56	279.00

Table 3 shows that respondents perceive various factors by the score of 1 – 5 with averagely the lowest score as 3.33 and the highest as 4.45.

Convergent Validity can be tested through value of loading factors or correlation of each construct with the indicator. It considers as reliable if all loading factors are more than 0.5 with significant of t-statistic more than 1.96 or p value < 0.05 on  $\alpha = 0.05$ . All indicators that cannot fulfil the requirement are excluded from model, and then another validity convergent test will be conducted once. Value of loading factors on each construct is seen in Table 4.

Table 4. Value of loading factor on each construct

Variable dan Indikator	Loading Factor ( $\lambda$ )	T-statistic	Result
Industrial Environment			
EI_2	0.676	4.024	Accepted
EI_3	0.724	3.671	Accepted
EI_4	0.668	3.560	Accepted
EI_5	0.727	8.238	Accepted
Organizational Performance			
OP1	0.519	3.283	Accepted
OP2	0.526	3.985	Accepted
OP3	0.672	6.250	Accepted
OP4	0.785	9.454	Accepted
OP5	0.566	3.904	Accepted
OP7	0.588	4.955	Accepted

OP8	0.586	3.882	Accepted
OP9	0.619	3.717	Accepted
GSCM			
GSCM13	0.740	2.953	Accepted
GSCM14	0.739	2.640	Accepted
GSCM17	0.593	1.784	Accepted
GSCM19	0.785	3.671	Accepted
GSCM20	0.548	2.438	Accepted

Table 3 shows that after recalculating by removing invalid items, all variables on indicators have fulfilled the convergent validity and considered as reliable because all loading factors are more than 0.5 with significant of t-statistic > 1.96 or p-value < 0.05 on  $\alpha = 0,05$ . Discriminant validity indicators can be analyzed by comparing the AVE roots of each construct with the correlation of other constructs in model (see Table 5 and 6).

**Table 5.** Correlation of each construct

Variable	Environment Industry	Organization Performance	GSCM
Environment Industry	1.000		
Organization Performance	0.787	1.000	
GSCM	0.245	0.316	1.000

**Table 6.** Value of AVE and root of AVE construct

Variable	Average variance extracted (AVE)	Root of AVE
Industrial Environment	0.489	0.699
Organizational Performance	0.376	0.613
GSCM	0.472	0.687

Table 5 and Table 6 are described:

- AVE root for organizational performance construct is 0.613. The correlation between organizational performance and other constructs is 0.787 and 0.316 relatively meaning that AVE root of 0.699 is higher than the correlation between organizational performance construct and GSCM construct, yet it is less than the industrial environment construct. In conclusion, the model has moderate discriminant validity.
- AVE root for l) industrial environment construct is 0.699. The correlation between industrial environment and other constructs is 0.787 and 0.245 relatively meaning that AVE root of 0.699 is higher than the correlation between industrial environment construct and GSCM construct, yet it is less than organizational performance construct. In conclusion, the model has moderate discriminant validity.

The composite reliability testing is seen from the composite reliability value and considered as good if it is > 0.6 (see Table 7).

**Table 7. Value of Composite Reliability**

Variable	Composite Reliability
Industrial Environment	0.793
Organizational Performance	0.826
GSCM	0.815

Table 7 shows that all constructs have satisfactory composite reliability value because they are above 0.6.

**Table 8. Variable of R-square**

Variable	R-square
Environment Industry	
Organization Performance	0.636
GSCM	0.060

**Table 9. Estimation result of inner weight**

	original sample estimate	mean of subsamples	Standard deviation	T-Statistic
Environment Industry -> Organization Performance	0.755	0.757	0.062	12.163
GSCM -> Organization Performance	0.131	0.152	0.080	1.629
Environment Industry -> GSCM	0.245	0.320	0.115	2.133

**Table 10. Estimation result of outer loading**

	original sample estimate	mean of subsamples	Standard deviation	T-Statistic
Environment Industry				
EI_2	0.676	0.718	0.168	4.024
EI_3	0.724	0.654	0.197	3.671
EI_4	0.668	0.568	0.188	3.560
EI_5	0.727	0.769	0.088	8.238
Organization Performance				
OP1	0.519	0.519	0.158	3.283
OP2	0.526	0.510	0.132	3.985
OP3	0.672	0.685	0.107	6.250
OP4	0.785	0.767	0.083	9.454
OP5	0.566	0.511	0.145	3.904
OP7	0.588	0.628	0.119	4.955
OP8	0.586	0.635	0.151	3.882

OP9	0.619	0.547	0.166	3.717
GSCM				
GSCM13	0.740	0.656	0.251	2.953
GSCM14	0.739	0.638	0.280	2.640
GSCM17	0.593	0.489	0.332	1.784
GSCM19	0.785	0.744	0.214	3.671
GSCM20	0.548	0.516	0.225	2.438

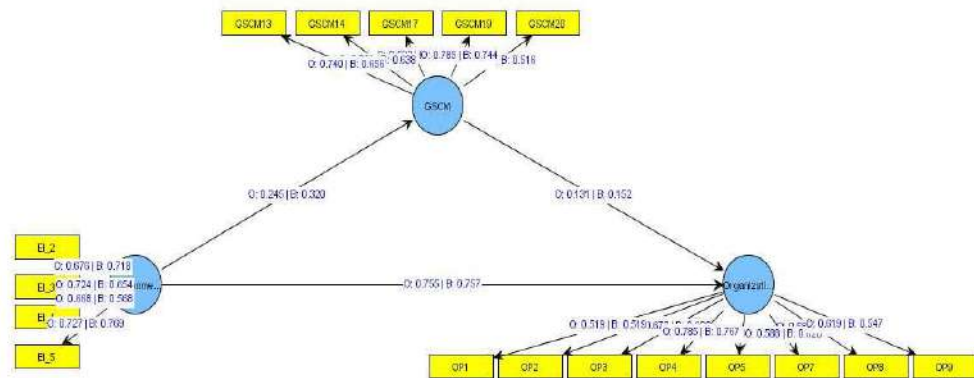


Figure 1. SEM PLS Model

From estimation based on Table 8 – 10, those are concluded:

1. All indicators of each construct have loading factor more than 0.5 with significant level on 0.05 (Table 10).
2. Parameter coefficient on relationship between industrial environment and organizational performance was 0.755 with significant level on 0.05 (Table 9).
3. Industrial environment and GSCM are able to explain its relationship to organizational performance as 63.6%, while the remaining 36.4% is explained by other variables excluded in this study (Table 8).
4. Hypothetical testing on Table 9 shows that industrial environment significantly influences organizational performance and GSCM; however, GSCM has no significant to organizational performance. Positive coefficient means that the more influence of industrial environment, the more increase on GSCM and organizational performance.

From PLS analysis for structural model testing with decentralization, the results show as seen in Table 11.

Table 11. Result of Moderation Effect Calculation

Relationship of each variable	original sample estimate	mean of subsamples	Standard deviation	T-Statistic
Industrial Environment -> Organization Performance	0.491	0.629	0.335	1.468
Decentralization -> Organization Performance	0.425	0.631	0.441	0.964
IE x DEC -> Organization Performance	-0.004	-0.329	0.701	0.006

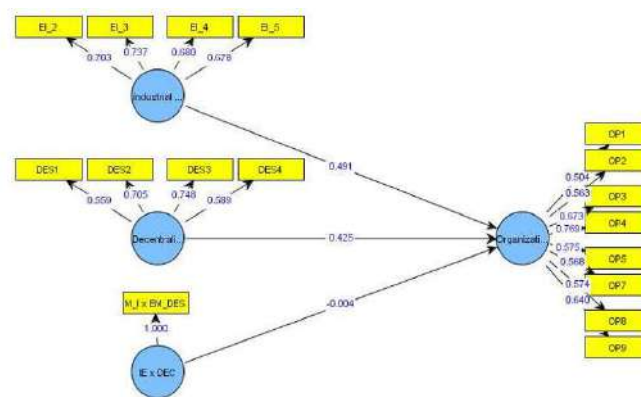


Figure 2. Model SEM PLS testing with modernization effects

The results show that decentralization provably had no significant influence on industrial environment to organizational performance, because the interaction between industrial environment and decentralization has a t-statistic less than 1.96.

#### 4.2. Discussion

From the study, it was obtained the fact that industrial environment significantly influenced the organizational performance of food and beverage SMEs in East Java Province. These are supported by (Chavez et al., 2016; David, 2011; Sila and Cek, 2017). It means that the higher influence on the industrial environment is, the more organizational performance will increase. As seen in Table 8, the indicator of the industrial environment "The level of supplier strength supplying raw materials" scores adequately with the lowest score of 3.76 meaning

that the level of competition among industry although categorized high can still be overcome by SMEs actors. However, in the indicator "The level of buyers' power to buy our products" has the highest score of 3.95 meaning that SME products actually have good competitiveness so they attract consumers, so they have no threat to organizational performance. Nevertheless, in an unstable environment with rapid environmental changes, this potential is likely to increase the threat to overall organizational performance. In conclusion, the increase in the environmental threats to the organization encourages SMEs continuously adapting to environmental changes in which it encourages SMEs to improve their performance.

The results show that the industrial environment positively influenced on GSCM implementation. These Although competition pressure and environmental changes threaten SMEs, they actually encourage SMEs to adapt to the changes including by implementing GSCM strategy. However, GSCM implementation is mainly limited to SMEs ability to work with customers to provide input on more economical designs, implement clean production, design products based on reuse, recycle, and recovery simply as well as efficiently relating to waste or remaining unused materials. Implementing GSCM to items such as acquiring ISO 14001-quality certification, implementing Total Quality Environmental Management, implementing environmental audits, as well as obtaining other certifications seemingly have not been fully implemented by SME actors.

The study indicates that GSCM did not have a significant influence on SMEs organizational performance. This shows that any GSCM practice has no actual influence on SMEs performance. Yet, it does not mean that GSCM practices are not important. This insignificant influence is more due to a number of indicator items excluded in the calculation analysis because the validity test requires the removal of invalid indicators (see Table 3). However, if the indicators are employed as references in implementing GSCM, they could be categorized moderate, moreover four items in the low category. Understandably, as the classic issues often faced by SME actors are limited capital and a lack of understanding of the concern for environmental management. In conclusion, although GSCM does not influence organizational performance, implementing GSCM is very important because the international community highly requires the food-beverage producers more concern on environmental management including in production processes. The results of this study support research conducted by (Lee et al., 2012), where GSCM has no positive impact on organizational performance.

Decentralization provably cannot moderate the influence of industrial environment on organizational performance. This was mostly because all SMEs

observed were mechanical organizations with centralized authority in which the decisions and authorities were centralized to one person (owner). A mechanical organization as a typically SMEs is indeed optional, however, this kind of organization will not be sufficiently capable of dealing with an unstable environment. The combination of a centralized mechanical organizational structure and an organic organizational structure with decentralized characteristics seemingly need to be carried out in facing sharp competition with an unstable environment, especially at present where Indonesia has joined the ASEAN economic free region. Increasingly intense competition with similar foreign products requires organizations to anticipate it quickly so the centralized decisions and authorities certainly become inefficient.

## **5. Conclusion**

Industrial environment has actual influence to GSCM and organizational performance of SMEs, yet GSCM has no significant influence on organizational performance neither decentralization cannot moderate the influence of industrial environment on organizational performance. The centralized authority on SMEs needs further investigation given to its rapid changes in environment which impacts to the fast response in order to anticipate the market changes. Further study needs to be carried out to determine the influence of centralized organizational structure to SMEs in foreign countries or in the foreign-owned companies. The limitation of this study is that the analysis only links the industrial environment and GSCM with organizational performance in the context in general. Future studies can examine all dimensions of performance, namely environmental performance, social performance, and financial performance. Further testing can use a larger sample to ascertain whether the application of GSCM is supposed to be done or even still not possible for SMEs in Indonesia.

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## Chapter 16

### Gonad-Stimulating Potential of Laserpuncture In Male Catfish (*Clarias Sp*)

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**Abstract** - Catfish is a freshwater fish widely consumed as food source of local community. Globally, sustainable aquaculture of catfish is very dependent on the presence of male broodstock by optimizing reproductive potential of gonads. The purpose of this study was to determine the effect of fed and laserpuncture induction in experimental and levels and only fed commercial, on the reproductive performance male catfish broodstock, including testosterone and androgen-binding protein (ABP), number of Sertoli cells and Leydig cells. Two cement pond each size 3.0 m x3.0 m x1.5 m were used, each measuring 24 male catfishes broodstock for experimental although control. Each group of fish was fed on their respective diets (group I and II was fed diet with a 38% crude protein) during 75days. Group I (experiment) of broodstock was induced with laserpuncture at duration of 15 seconds every 15 days for 75 days. The gonad performance male catfish parameters were monitored during 75 days. Male catfish fed and laserpuncture induction had significantly higher ( $P < 0.000$ ) testosterone levels and ABP levels compared to those on only fed, but for numbers of of Sertoli cells and Leydig cells had more compared to other groups. There were two peaks in reproductive performance characteristic testosterone levels and ABP levels also number of Sertoli cells and Leydig cells on day to 30 and 60. In conclusion, laserpuncture induction in male catfish was able to stimulate gonadal performance. In the future, this research is recommended to be applied widespread to increase catfish seed in the industry for future food security.

**Keywords:** Androgen Binding Protein, testosterone, Sertoli cells, Leydig cells, sustainable development

## 1. Introduction

The rapid growth of human populations is not comparable to food productivity growth, causing an impact on food security (Godfray et al. 2010; Godfray & Garnett, 2014). Food security is important to ensure the health of all member of community. Lack of nutrition has been known widely to cause various diseases, for example lack of protein can lead to kwashiorkor and marasmus disease. Sustainable Development Goals (SDGs) are aimed to end all forms of poverty and hunger. Thus, to achieve food safety and security, increase of nutrition and sustainable agriculture need to be encouraged (FAO 2018). Aquaculture is one of the solutions for providing cheap and easy animal source of food for food-insecure population worldwide (Kobayashi et al., 2015; Golden et al. 2017). It was reported that the aquaculture sector was able to support human food supply around 7% in 1974, increasing to 26% in 1994, 39% in 2004, 50% in 2015 and 25.7 % in 2016 (FAO 2016; FAO 2018; Mkong et al. 2018). In 2017 that total production of aquatic animals has reached 46.4 % (FAO 2019).

The sporadic growth of the global aquaculture industry has been occurred in different countries as cultivated fishes can support the community's growing need for food (FAO 2012). For example, catfish is a freshwater fish who had been farmed and it has a high aquacultural potential (Çek and Yılmaz 2007; Soliman and Yacout 2016) and using aquaculture method in various Asian countries, such as China, India, Philippines, Laos, Malaysia, and Indonesia (Ottolenghi et al. 2004; Ochokwu et al. 2015; Sahoo et al. 2016).

Aquaculture that supports the needs of fish that continue to increase this is certainly required quality broodstock and seed in many quantities. Despite the many benefits derived from aquaculture such as the provision of food fish for the population and the generation of employment, the industry is faced with many challenges, notable among them are inadequate supply of quality broodstocks and seeds also feed to broodstock (Mensah et al. 2018) and changes in environmental conditions and its effects on production (El-Sayed and Kawanna 2008; Bostock et al 2010; Brander 2010; Phelps 2010, Shamsan and Ansari 2010; FAO 2012; Lind et al 2012; Alemayehu and Getahun 2017; Azpeitia et al. 2017). This is because the broodstock handling is less concerned with the low egg hatchability of fertilized eggs and low seed (Aiyelari et al. 2007; Adewumi and Olaleye 2011).

Quality fish seeds are necessary to obtain superior fish population, meaning that fish gonads also need to produce high-quality gametes (Mylonas et al. 2004; Mansour et al.2005; Bobe and Labbe 2010; Mylonas et al. 2010; Migaud et al. 2013, Valdebenito et al. 2013; Gbemisola and Adebayo 2014; Wang et al. 2014; Ogidan et al. 2018), in addition to good broodstock selection based on age and

weight (Jokthan 2013; Saho et al., 2016, 2019; Juin and Nath, 2018). For procuring quality fish seeds, not only good female gametes are required in aquaculture, but also quality spermatozoa that will fertilize the ovum. Spermatozoa quality is critical in determining successful natural and artificial fertilization (Bart and Dunham 1996; Tekin et al. 2003; Mansour et al. 2004, 2005; Fauvel et al. 2010; Dada and Ogunduyile 2011; Gbemisola and Adebayo 2014; Locatello et al. 2018; Odo et al. 2018).

Globally, sustainable aquaculture of catfish is very dependent on the presence of male broodstock by optimizing reproductive potential of gonads. The growth and development of the optimal catfish broodstock gonad is mainly influenced by feed quality. For that to note is the balance between protein and energy in feed (Salhi et al. 2004; Ali and Jauncey 2005). Catfish has especially high level of protein which can be eaten to fulfill daily nutrition requirement (Keremah & Esquire 2014). Proteins and lipids are considered to play a pivotal role in reproduction. (Khan et al. 2005). Quality feeding and certain treatment can also affect the quality of these gametes and can be used to stimulate the maturation of gonads (Çek & Yilmaz, 2007, 2009; Izquierdo et al. 2001; Shearer & Swanson, 2000). This process is associated with reproductive hormones that will affect the activity of gametogenesis (Yaron et al., 2003; Ochokwu et al. 2015). Steroid hormones like testosterone are manufactured by Leydig cells in tubuli seminiferi. Testosterone plays a role in regulating the activity of the Sertoli cells located in Tubuli seminiferi. Furthermore testosterone together with the Sertoli cell regulate spermatogenesis and the eventual sperm product and stimulate the secretion of Androgen Binding Protein (ABP) (Amer et al, 2001; Meachem et al. 2005; Ohta et al. 2007; Cheng et al. 2010).

Besides providing quality feed there are other technologies that play a role in accelerating the maturation of fish gonads technology laserpuncture. As revealed by Kusuma (2013) that studied the effect of laserpuncture induction can spur speed-maturation of gonads and enhance the production of steroid hormones. In this research of the limitation was that a female broodstock who had never spawned was selected as a mature gonad that was given quality feed. Furthermore, male and female catfish broodstock induced laserpuncture up to spawn. The use of male catfish here is only for spawning. The next step is the female catfish induced laserpuncture every 7 days until the gonads mature. Based on the results of this Kusuma (2013) study as a reference for this study in terms of the type of laserpuncture, the location of the induction point at the point of reproduction and the duration of induction of the laserpuncture for 15 seconds. The research conducted here which is different is a laserpuncture induction done every 15 days

once within 75 days and parameter research. Research conducted here is focused on male catfish that have never been spawned. The role of female catfish in producing quality seeds by providing quality food has been widely discussed. No less important is the role of male catfishes which supports the success in fertilizing eggs that are ready to be fertilized. For this reason, male catfish gonad potential needs to be boosted. For your consideration is the male catfish broodstock contributes to the success of catfish.

Based on the elaboration above, certain methods application to male catfish needs to be evaluated in order to obtain good quality of spermatozoa. In this study, we investigated the effect of high-protein content diet and soft laserpuncture induction to gonads of male catfishes to produce superior spermatozoa. In the current study, the level of ABP and testosterone in blood serum, and the number of Sertoli and Leydig cells in the male gonads were evaluated as indicators of reproductive ability of male catfishes.

## **2. Materials and Methods**

### **2.1. Catfish Maintenance, Diets, and Laserpuncture Induction**

This study was carried out in the Freshwater Cultivation Management Unit (Unit Pengelola Budidaya Air Tawar/UPBAT), Kepanjen, From April 2018 to July 2018. male catfishes broodstock that had never been spawned before, aged around one year old weighted around 1,000-1,200 g

This study was carried out in the Freshwater Cultivation Management Unit (Unit Pengelola Budidaya Air Tawar/UPBAT), Kepanjen, Malang from April 2018 to July 2018. The experiment was performed for 75 days and at least four males were randomly sampled every 15 days for induction group laserpuncture and four males control group, in a total of 48 catfishes. The broodstock that had never been spawned before. This aged approximately one year old, weighted around 1.000-1.200 g were distributed into 3.0 m x3.0 m x1.5 m concrete rectangular tank contains water as high as 70 cm under natural photoperiod for 75 days when experiment. Catfish was acclimatized then for 10 days in the adaptation pond.

Feed given to broodstock was catfish broodstock-specific commercial feed with 38% Crude Protein (CP Prima, Surabaya, Indonesia). Feed was given twice daily (8:00 a.m and 4:00 p.m) for about 4% of body weight during treatment period. Water quality was checked out every three daily including water temperature, pH and dissolved oxygen (DO). Water temperature was measured with thermometer in-situ, DO in-situ using oxygen meter and pH in-situ pH meter digital.



Catfish was divided into 2 groups with twenty catfishes respectively; group I was CP-fed and induced with soft Helium-Neon (He-Ne\_laser puncture while group II was CP-fed but not laser-induced. Soft laserpuncture applied had the characteristics of 632.8 nm wavelengths, released from 0.2 cm<sup>2</sup> laser beams, with 5 mW/cm<sup>2</sup> power output. Laserpuncture was induced at reproductive point, precisely in the 2/3 part of ventral body for 15 seconds (Kusuma et al. 2017a,b, Kusuma and Hariani 2019). Laserpuncture was induced to group I starting on day 0 after the acclimatization period was finished, then every 15 days until 75th day.

At the start of experiment, all fish was weighted using electric scales with a maximum capacity of 5 kg to determine fish initial weight and weight of feed given 15 days ahead. Fish was also weighed on day 15, 30, 45, 60 and 75 both to monitor body weight and adjust feed weight that would be given.

## **2.2. Fish Sampling**

On the 0th, 15th, 30th, 45th, 60th and 75th days, 4 random fishes from each group were harvested. Blood was first collected using disposable syringe from caudal fin vein from each fish. Blood was centrifuged at 1500-3000 rpm for 10 minutes at 4°C to collect serum. Supernatant was separated into a labeled microtube using micropipette. Serums were stored at -20°C until it was ready to be used (Sink et al. 2008). Fish gonads (testes) was collected and rinsed in Phosphate Buffer, then fixated in Bouin's solution for 24-hour before being stored at 70% ethanol until further processing.

## **2.3. Enzyme-linked immunosorbent assay (ELISA)**

Serum was assayed using ELISA kit to determine testosterone (T) (ELISA Kit Cat. No. CSB-E17554Fh) and androgen binding protein (ABP) (ELISA Kit Cat. No. E0121Fi.) Level according to manual and read using ELISA reader at 450 nm wavelength (Sink et al. 2008). Antigen was firstly coated onto plate. Antigen was diluted with coating buffer (1:20) and added to well plate. Plate was incubated at 40°C overnight then washed using PBS-Tween for three times. Antigen was then blocked by adding 100 µL blocking buffer (1% BSA in PBS) into each well and incubated for 2 hours at room temperature. After that, plate was washed again with PBS-Tween. Next, primary antibody of anti-bovine CD181/CXCR1 (Biolegend) was dissolved 1:1000 in PBS-BSA. About 100 µL dissolved primary antibody was added into respective well, incubated for 2 hours at room temperature, before re-washed using PBS-Tween. Secondary antibody was then bound onto primary antibody. Labeled IgG-biotin anti-mouse dissolved in final formulation buffer (FFB) (1: 250) first, then 100 µL of it was added into each well, before

incubated for 1 hour at room temperature. Plate was washed again using PBS Tween. Diluted SA-HRP (1: 500) was added and incubated 45 minutes, before washed again with PBS-Tween. Lastly, 50  $\mu$ L TMB substrate was added into each well before reaction was immediately stopped by adding stop reaction (1N HCl). Secondary Ab complex bond with SAHRP-TMB was read with ELISA reader at 450 nm wavelength.

#### **2.4. Tissue section evaluation**

Fixed fish testes were first dehydrated using alcohol series (70%-100%), then equilibrated in xylene. Sample was then infiltrated in paraffin before embedded in paraffin block. Gonads were sectioned longitudinally with 5  $\mu$ m thickness using microtome. Tissue section was stained using Hematoxylin-Eosin (H-E) before mounted. Section was evaluated blind (Baeverfjord and Krogdahl, 1996) to determine the number of Sertoli and Leydig cells.

#### **2.5. Statistical analysis**

Testosterone and ABP level were analyzed using two-way ANOVA and continued with Duncan's Multiple Range Test using SPSS Ver. 15.0 for Windows at confidence level of 95%. The number of Leydig and Sertoli cells was counted using IMAGE RASTER 3.0 software. The number of Sertoli and Leydig cells were evaluated through histological images and analyzed quantitatively.

### **3. Results**

#### **3.1. Environmental**

The environmental parameters monitored during the study were obtained as follows: temperature 26.30-28.100C, DO 3.0-4.20 mg L<sup>-1</sup> and pH 6.8-7.2. This environmental quality can be categorized as normal and suitable for raising broodstock fish during the study.

#### **3.2. Testosterone and ABP Level**

Testosterone values in male catfish broodstock ranged from  $1.79 \pm 0.34$  ng/ml to  $17.97 \pm 0.54$  ng/ml to laserpuncture-induced group and control group the value is  $1.79 \pm 0.34$  ng/ml to  $11.85 \pm 0.4$  ng/ml during 75 days the study period (Table. 1 and Fig. 1). For Androgen Binding Protein (ABP) values ranged from  $1.69 \pm 0.27$  ng/ml to  $14.43 \pm 0.07$  ng/ml to laserpuncture-induced group and control group the value is  $1.69 \pm 0.27$  ng/ml to  $9.61 \pm 0.63$  ng/ml. There was a significant difference ( $P < 0.05$ ) in the levels of 15 daily testosterone and ABP during reproductive cycle. The highest levels of testosterone were observed in  $17.97 \pm 0.54$  ng/ml and

ABP  $11.85 \pm 0.4$  ng/ml on day 75 to laserpuncture-induced group. Low levels were observed on day-0 and then it increased in day-15, 30, 60 and 75. The testosterone levels and ABP dropped in day 45. Increasing the level of Testosterone until reaching peak indicates that the condition of the male catfish broodstock is experiencing the process towards maturation of gonads and peak explain by drawing it the ripe gonads in the reproduction cycle. In contrast, the levels of Testosterone and the ABP drop on day 45 indicate the state of the gonads leading to the initial condition of the reproduction cycle.

The Testosterone hormone profile in this study demonstrates two peak shows that are non-seasonal patterns. There is a difference in the Testosterone levels of significant hormones ( $p < 0.05$ ) on every 15 daily either a laserpuncture-induced group or a control group, but the level is higher than the control group. It also happens to ABP whose condition is similar to Testosterone. Catfish given CP feed and laserpuncture induction expressed testosterone and ABP level significantly higher at all times compared to control. Highest level of T and ABP were found on day 75 in both of these treatment groups (Figure 1). Comparison of T and ABP level from both groups is presented in Table 1.

Table 1. Testosterone and ABP level (ng/mL) from control and laserpuncture-induced group of male catfishes

Days	Testosteron level (ng/ml)			ABP level (ng/ml)		Increase of ABP Level (%)
	Control	Laserpuncture Induction	Increase of Testosterone level (%)	Control	Laserpuncture Induction	
0	1.79 $\pm 0.34^a$	$1.79 \pm 0.34^a$	0	$1.69 \pm 0.27^a$	$1.69 \pm 0.27^a$	0
15	3.49 $\pm 0.89^a$	$6.05 \pm 0.74^b$	42.31	$2.25 \pm 0.02^a$	$4.99 \pm 0.01^b$	54.91
30	9.21 $\pm 0.50^c$	$13.60 \pm 0.67^c$	32.28	$7.69 \pm 0.04^c$	$11.70 \pm 0.10^d$	34.27
45	6.78 $\pm 0.41^b$	$8.04 \pm 0.38^b$	15.67	$5.69 \pm 0.39^b$	$7.81 \pm 0.09^c$	27.14
60	8.15 $\pm 0.11^b$	$12.83 \pm 0.18^c$	36.48	$6.08 \pm 0.48^b$	$10.05 \pm 0.20^d$	39.50
75	$11.85 \pm 0.4^c$	$17.97 \pm 0.54^d$	34.06	$9.61 \pm 0.63^d$	$14.43 \pm 0.07^f$	33.40

Information : \*) Different superscript letters indicate statistical difference ( $p < 0.05$ )

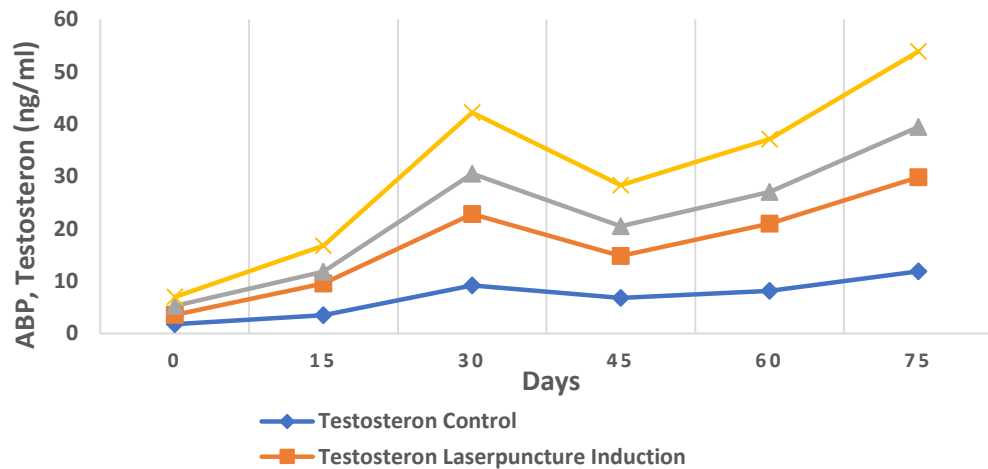


Figure 1. Mean level of ABP and testosterone (ng/mL) in control and laserpuncture-induced male catfishes.

Result showed that Testosterone and ABP levels had two peaks which were reached on day 30 and day 75 respectively both in control and laser-induced groups, indicating that there were two spermatogenesis process occurred during experiment. Peak of day 75 had higher level of both T and ABP compared to day 30 (Figure 1). T levels in blood serum after addition of quality feeding and laserpuncture induction for 75 days formed a fluctuating trend both in CP-fed control and laserpuncture-induced group. Increase of T level in laserpuncture-induced catfish was higher compared to control only fed CP, from the first observation at day 0 until the end of treatment period at day 75. Statistical test showed that there was significant difference in both T and ABP serum level of either to control (only CP-fed) and laserpuncture-induced group based on treatment period ( $P < 0.05$ ).

### 3.3. Number of Sertoli and Leydig cells

The results of the number of Sertoli and Leydig cells were evaluated from testes section stained with HE of male catfish in experimental group and control group is shown trend in are recorded in Fig.2 respectively. The trend of the number of Sertoli and Leydig cells is like the level of testosterone and ABP of both groups of CP-fed (control) and CP-laser induced indicated increase on day 15, 30, 60 and 75 and drop on day 45. The peaks reached on day 30 and 75, the most reached on day 75 and the lowest on day 0. However, the number of Sertoli cells is much more than the Leydig cells because the Sertoli cell surround spermatogonia. Therefore the number of Sertoli cells much more than in the Leydig cells. Both groups of CP-fed (control) and CP-laser induced indicated increase of both Sertoli

and Leydig cells, number Sertoli cells were found to be affected more by laserpuncture than Leydig cells, as Sertoli cells shown more increase in percentage compared to Leydig cells. Significant raise was also found in Sertoli cells number given laserpuncture induction compared to CP-fed only fish (Table 2). The increasing number of Leydig cells on these days is related to the increasing levels of testosterone and the peak indicate the maximum number required when the the gonad condition is ripe. By the time the number of Leydig cells dropp indicates the condition of the development in the reproductive cycle to the initial position.

Based on section of male catfish testicular seminiferous tubules, there were significant differences of Sertoli and Leydig cells number from control group and laserpuncture-induction group. In the laserpuncture group, there was an increase in the number of both Sertoli and Leydig cells every 15 days for 75 days (62.44% and 68.82% respectively). As seen in Sertoli and Leydig cells, the number of both cells peaked at day 30 and 75, indicating that there were two process of spermatogenesis occurring during the course of experiment.

Table 2. The number of Sertoli and Leydig cells in control and laserpuncture-induced group male catfishes

Days	Number of Sertoli cells		Increase of Sertoli cell number (%)	Number of Leydig Cells		Increase of Leydig cell number (%)
	Control	Laserpuncture Induction		Control	Laserpuncture Induction	
0	8.0±1.3	8.0 ±1.3	0	7.1± 1.3	7.1 ± 1.3	0
15	15± 0.6	21 ±1.7	28.57	10 ± 1.3	16 ± 2.2	9.75
30	53±6.3	137± 3.6	61.31	45 ± 1.8	101± 3.1	55.45
45	21±2.2	32 ±2.5	52.38	16 ± 2.22	25 ± 1.7	36
60	44±8.5	102±5.9	56.86	39 ± 9.8	83 ± 10.7	53.01
75	74±9.2	197±16.2	62.44	53 ± 6.2	170±11.4	68.82

Result strongly supported that quality feeding can increase gonad potential, indicated by increased number of Sertoli cells and Leydig cells. The combination of quality feed and laserpuncture induction in the male broodstock could increase the number even higher along treatment period (Fig 2). Increasing number of cells is related to respective function of Sertoli and Leydig cells, indicating higher reproductive potential. It can be concluded that the number of Sertoli and Leydig cells increases as a result of the broodstock being given quality feed combined with induction of laserpuncture.

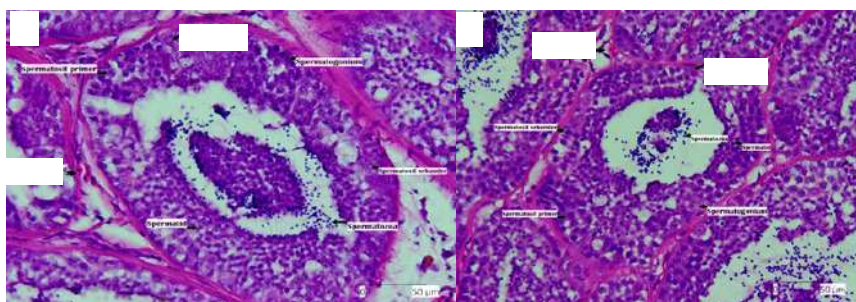


Figure 2. Histology section showing Sertoli and Leydig cells in control (A) and Laserpuncture-induced group (B) from day 60.

#### 4. Discussion

In the aquaculture of fish, cultivation need to understand the reproduction cycle so that sustainability of the cultivation can run well. The reproductive cycle of fish is characterized by several reproductive processes which include oogenesis and spermatogenesis and are related to gonadal maturation and also involve sex steroid hormones (Lubzens et al. 2010; Schulz et al. 2010; Schulz and Nóbrega 2011; Schulz et al.2019).

In the aquaculture of fish the broodstock ability to produce high quality gametes is one of the keys of success and optimal reproductive outcomes highly dependent on the quality of its maintenance environment (Hajirezaee et al., 2010). Some of the critical parameters affecting the aquatic environment in the maintenance of broodstock fish include water temperature, dissolved oxygen (DO) and pH (Timmons et al. 2001; De Silva and Soto 2009; Brander 2010). Fish is a cold-blooded animal whose body temperature is adjusted to the temperature of aquaculture (FAO 2008). Water temperature is one of the physical variables very important and can affect the growth and development of fish gonads (Viadero 2005). Therefore, the temperature changes above or below the range of habitat tolerance will affect the general metabolism and implications for the growth and development of the gonads (Peck et al. 2006). The environmental parameters monitored during the ongoing research can be normally attributed with temperature 26.60-28.10°C, DO 3.0-4.20 mg L<sup>-1</sup> and pHnya 6.8-7.2. If the water temperature is relatively high, it will be able to increase the metabolic rate of fish resulting in higher feed intake so that the growth is faster. The broodstock fish environment is an important limiting factor that can significantly affect fish health, growth and development, and spawning. Water temperature can affect the metabolism in the fish body. Good eating activities in fish can affect the growth and development

rate of the gonads and can increase reproductive potential. The results of this research are not much different from the results of research conducted by Mensah et al. (2018) for commercial farm in temperature during dry season  $28.5 \pm 0.33$  and wet season  $28.0 \pm 0.73$ ; DO during dry season  $3.77 \pm 0.68 \text{ mg L}^{-1}$  and wet season  $3.40 \pm 0.79 \text{ mg L}^{-1}$  and for pH during dry season  $7.04 \pm 0.38$  and wet season  $6.77 \pm 0.16$ . The broodstock fish environment is an important limiting factor that can significantly affect fish health, growth and development, and spawning (Timmons et al. 2001). Sexual maturation can limit growth by diverting energy into gonad development and gamete production (Morash and Alter 2016)

Svobodová et al. (1993) that relatively high temperatures increase the metabolic rate of fish furthermore resulting in higher feed intake and faster growth for the warm water species. Azaza et al. (2008) and Santos et al. (2013) have demonstrated that growth performance of *O. niloticus* depends on temperature with increased growth rate with an increase in water temperature and achieving its optimum at  $30^{\circ}\text{C}$ , then decreased significantly at  $34^{\circ}\text{C}$ .

In this study, catfish used to be one year old and has never been spawn before, making the gonads still possible to be stimulated. Broodstock catfish sampling limitation is limited to 4 tails for each treatment group and the sample control group on the 0, 15, 30, 45, 60 and 75 days aims to maintain the broodstock sustainability. By providing quality feed and inducing laserpuncture, the process of gonad maturation can be accelerated, indicated by various reproductive parameters such as testosterone and ABP levels, the number of Sertoli cells and Leydig cells. In the present study, the reproductive parameters of male catfish peaks twice during the course of experiment, which were on day 30 and 75, both in control and laserpuncture-induced group. After the parameters were peaked in day 30, they tended to lower in day 45. The decrease of various reproductive parameters in day 45 was due to broodstock starting a new cycle of spermatogenesis. Parameters were found to increase again in day 60 and peaked secondly in day 75, indicating the completion of gonad maturation.

The high levels of testosterone indicate that the male catfish is undergoing spermatogenesis, spermyogenesis, and spermiation. Conversely at times low testosterone levels indicate current male catfish in the proliferation phase of spermatogonia which is the resting phase. This indicated that there was spermatogenesis process occurring in the fish every 30 days. Means the time (duration of treatment) will affect the process of spermatogenesis.

The activity of spermatogenesis is influenced by steroid hormones. Strengthened by Hilbig et al. (2016) stated that broodstock age influences the

quality of gametes and affects reproductive performance. Supported by Otoh and Udoh (2019), Rahbar et al (2012) and Chalde et al.(2014) broodstock age also on gamete relationships with sex steroid plasma levels.. The male catfish used in the study was about one year old never had spawning, of course it still takes time to spur the condition of the gonad to be fast matured and sperm production will increase. These gonads and sperm conditions are accompanied by an increase in steroid hormones such as testosterone. Weltzein et al. (2002; 2004) asserted that *H. nemurus* males produced milt in October, November and June were peaks in catfish. Achieving a high level of testosterone signifies this catfish undergoing spermatogenesis, spermyogenesis, and spermiation and when low testosterone levels signify the catfish to its initial state it is subjected to a phase of proliferation of spermatogonia.

At the moment the level of testosterone reaches peak indicated many sperm is released in the spawning condition. Testosterone in fish is synthesized and secreted in the testes. Testicular fish can synthesize Testosterone displayed regulatory effects on spermatogenesis especially on spermatogonia multiplication and spermatocyte differentiation (Schneider and Poehland 2009; Zohar et al. 2010; Schulz et al. 2010). Confirmed by Tessaro et al (2019) also Chatakondi and. Davis (2011) that levels of sex steroids in plasma can be used as indirect indicators of fish reproductive capacity. At a time when high testosterone levels indicate a mature gonads condition. As revealed by Kobayash et al. (1996) also Gazola and Borella (1997) that this significantly decreased level of testosterone shows the condition of the transition towards a regression phase. It is undeniable that there is a link between the fluctuation of steroid hormone levels with the reproductive process in fish as reported by Miura and Miura (2003) also by Munakata and Kobayashi (2010).

This study was conducted for 75 days there are two peak. The results of this study are different from the results of research conducted by Adebisi et al (2013) which was done for 13 months and his observation once a month, there are four peak. The difference is the result of this study was fed with CP 38% and laserpunctures and sampling every 15 days and the level is higher than the one done by Adebisi et al (2013). This discrepancy can be reviewed from (1) feeding with CP 38% and (2) feed with 38% CP plus laserpunctures induction.

Previous research on feed especially for female catfish broodstock and for rearing catfish seeds has done a lot many, but for male catfish broodstock still not much revealed. As done by Çek and Yilmaz (2009) about the effects of five isonitrogenous (35% crude protein) diets having different energy contents; 10.85, 11.82, 12.73, 13.69, and 15.06 MJ DE/kg, respectively, on the gonads development and



weight gain of Sharptooth catfish fingerlings. Energy contents of the experimental diets were increased with the increasing amount of soy-acid oil (0, 4, 8.5, 13, 18%) and each group of fish was fed on their respective diets (group I was fed diet I) during 180 days. The gonads maturation was significantly affected by dietary energy.

For spermatogenesis activity, good nutritional intake is required. Quality feed has been proven to improve reproductive performance (Dada and Ejete-iroh 2015; Bindari et al., 2013; Eyo et al., 2012; Adewumi, 2006; Adewumi et al. 2005). Broodstocks of African catfish (*Clarias garepinus*) fed 40% crude protein supplemented with date palm (*Phoenix dactylifera*) seed had significantly increased milt quality (Dada and Fagbohun, 2018). In this study the administration of Crude Protein (CP) feed was 38% commercial feed special for the broodstock catfish which is a difference of 2% lower than the research Dada and Fagbohun (2018). Fish that had the diet with CP 38% seem to have the best protein intake for good gonad development in males. Feed with 38% CP given to fish can be used as raw material for the formation of enzymes and hormones that contribute in reproductive processes. Thus, the availability of protein is important to stimulate reproductive physiological activity, including testosterone and various hormones formation. Nevertheless feed with CP 38% and the induction laserpunctures better results from the researchers above in accelerating the maturation of male catfish gonads. Besides that to the maturation process of the gonads that this reproductive physiology activity can be accelerated by the induction of laserpunctures.

Kusuma (2013) that studied the effect of laserpuncture induction can spur speed-maturation of gonads and enhance the production of steroid hormones yaitu hormone Gonadotropine Hormone (GtH-I and GtH-II) on broodstock catfish. Kusuma et al. (2017) researched about the role of laserpuncture exposure on gonad maturation mechanism of catfish (*Clarias sp.*) through  $Ca^{2+}$ , PKC and GABA neurotransmitter on female catfish broodstock. Further research was conducted by Hariani and Slamet (2019) about combination of feed protein level and laserpuncture induction of broodstock catfish (*Clarias sp.*) to increase estrogen, vitellogenin, and egg quality on broodstock catfish. Fish fed diets with increased protein levels and exposed to laserpuncture induction had significantly enhanced estrogen and vitellogenin blood serum levels ( $P < 0.001$ ). Current research on male catfishes, the laser type is the same as the He-Ne laser, the induction is at the point of reproduction for 15 seconds. The difference from previous research is the female catfish and laserpuncture induction every 7 days. In the research conducted here is the male catfish broodstock and the provision of laser induction every 15 days with consideration to reduce the stress of the broodstock. In sync with the effect of

quality feeding, laserpuncture induction also further spur the process of gonadal maturation, in which laser puncture treatment with power of 5mW and wavelength of 632.8 nm to catfish could increase the number of Leydig.

Emphasized on the feed quality and laser induction to enhance hormones (GtH-I and GtH-II) production (Kusuma et al. 2015). It was possible that laser was able to penetrate the skin from epidermis to dermis layer. In these areas, many peripheral nerve endings are located, which are very sensitive towards laser effect. Laser can induce polarization in the nerve membrane, which in turn experience action potential, resulting in the opening of the extracellular  $Ca^{2+}$  channel in the membrane and inducing intracellular influx of  $Ca^{2+}$  level.  $Ca^{2+}$  influx will raise the synthesis of neurotransmitter Gamma Aminobutyric Acid (GABA), which in turn stimulates hypothalamic and pituitary neurons (Kusuma et al, 2017b).

Reproduction activity is primarily managed by the hypothalamic-pituitary-gonadal axis. In fish, the hypothalamus will synthesize and release gonadotropin (GtHs). The hypothalamus will release hormone gonadotropin (GnRH) which stimulates the anterior pituitary gland to release follicle-stimulating hormone (FSH) or Gonadotropin Hormone-I (GtH-I) and luteinizing hormone (LH) or Gonadotropin Hormone-II (GtH-II) so that GnRH can be said as a key player for reproductive activity (Weltzien et al. 2004; Chaube et al. 2015; Golan et al, 2015; Honji and Moreira 2019). Gonadal maturation process is usually influenced by Luteinizing Hormone (LH)/Gonadotropin Hormone-II (GtH-II), however testosterone also contributes in gametogenesis process, which in turn affect gonadal maturation. Zmora et al. (2015) give expression that spermatogenesis is regulated by pituitary gonadotropins (GtHs : GtH-I and GtH-II). GtHs is controlled by hypothalamic to synthesis and release gonadotropin-releasing hormone (GnRH). Besides that Kisspeptin is a hormone involved in the onset of puberty and the stimulation of reproductive function, and it has been shown recently to influence both GnRH expression in the brain. Added by Albers-Wolthers et al. (2017) that kisspeptin play a key-role in regulation of the hypothalamic-pituitary-gonadal axis.

The response of the pituitary neurons due to the provision of quality laser induction has been shown to increase release of gonadotropin hormone (GtH-I and GtH-II). Both GtHs are then delivered to gonad via blood circulation. In gonads, GtH-I play role in steroidogenesis to produce steroid hormones including testosterone. GtH-I can also stimulate the development and proliferation of Sertoli cells, which in turn produce Androgen Binding Protein (ABP). ABP will further stimulates spermatogenesis process. Meanwhile, GtH-II stimulates Leydig cells to release testosterone. GtH-II also induces the development of seminiferous tubules and Sertoli cells as environment for spermatozoa formation. Testosterone and ABP

together function in controlling spermatozoa formation, stimulating the initial development of spermatogenic cells.

It is clear that Sertoli cells surround spermatogonia and play a role in nourishing spermatogenesis. Both Sertoli cells and Leydig cells act as endocrine cells that regulate the activity of spermatogenesis (Schulz et al. 2010; Schulz and Nóbrega, 2011). Sertoli cells will secrete ABP (Grover et al. 2004) and Leydig cells will secrete testosterone (Ahmed et al. 2013). ABP is responsible for transporting steroids in the blood in the teleosts group of fish and influencing the bioactivity of sex steroids (Hammond, 2016). GtH-II acts to stimulate Leydig cells to produce testosterone and plays a role in regulating the activity of Sertoli cells in the seminiferous tubules. Furthermore, testosterone with Sertoli cells regulates spermatogenesis and finally sperm products and stimulates the secretion of ABP (Amer et al. 2001; Meachem et al. 2005; Ohta et al. 2007; Cheng, et al. 2010). GtH-I (FSH) and androgen effects on Sertoli cells and other testicular somatic cell types, are the two most linked endocrine trigger for pubertal testis maturation and adult spermatogenesis in fish (Chauvigne et al. 2012; Crespo et al. 2016).

The increase of various reproductive parameters observed in CP-fed and laserpuncture-induced catfish broodstock will ensure the production of spermatozoa with good quality. Spermatozoa with good quality can in turn ensure the success of fertilization, resulting in superior seeds of catfish. Ensuring high number of quality gametes will support the industrialization of fish seeds. At this level, seeds can be maintained with good feeding and care, grown into sustainable catfish population that can be harvested periodically as a food source that provide nutrition to local community. Thus, by giving CP feed and inducing laserpuncture to catfishes, sustainable catfish population at industrial level can be maintained more readily to ensure food security of community as one of target of SDGs.

## **5. Conclusion And Recommendation**

### **5.1. Conclusion**

The combinations of high-level of protein feeding and laserpuncture induction were able to increase the reproductive ability of male catfish broodstock. The level of testosterone, androgen-binding protein, number of Sertoli cells and Leydig cells were found to be higher in CP-fed and laserpuncture-induced fish compared to control that was not induced with laserpuncture.

### **5.2. Limitation**

This study is limited to a small number of catfishes from one population of broodstock. Water quality as though water temperature, pH and dissolved oxygen is a limitation of this research. The number of laserpuncture devices are also limited, thus availability of this application still cannot be widely spread.

### **5.3. Future direction of research**

There are still many gaps in this study to be further examined, such as effect of laserpuncture induction on molecular dynamics on the presence or absence of changes in DNA and RNA, heat shock protein, ATP production, and ROS. Further development can also be looked into higher number of samples from different catfish population. In the future, the method of laserpuncture to enhance fish seeds will hopefully be able to be applied widespread in industrial level, not only in catfish but also in other species of fish farmed as food source for various community. Quality of fish seeds will ensure the sustainability of fish population supporting the growth of aquaculture. Well-maintained fish population can also be harvested more readily, producing higher number of fishes to maintain food security for local community. Food-secure community receiving nutritious and balanced food regularly can live healthy.

## **6. Acknowledgment**

Author would like to thank to *DPRM* of Ministry of Research, Technology, and Higher Education who had provided research grants, thus this study could be performed; Head of the Kepanjen UPBAT along with staff especially Mr. Moh Sori S.Pi who had provided assistance and the use of research facilities; Mrs Erlina S.Si of Biochemical Laboratory of Hang Tua Surabaya Faculty of Medicine who helped to ELISA analysis; and Mr. Ari of Pathology and Histology Laboratory of Airlangga University Faculty of Medicine who had assisted author in preparing gonadal section.

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## Chapter 17

### Determining Factors of Corporate Governance in Women Corporative of East Java Indonesia

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**Abstract** - All over the world want organizations to be sustainable, like organizations in Indonesia. Corporate governance (CG) implementation is a must in an organization. The application of corporate governance in Indonesia is applied to organizations in the form of cooperatives. Cooperatives are microfinance institutions for cooperative members. Cooperatives are organizations that are established for the welfare of members. The study aimed to determine factors of corporate governance in women corporative of East Java, Indonesia. Internal control in this study was measured by the activities of the cooperative supervisor in carrying out the task. The rules for member fees are measured by the members' activities in paying the basic contributions and compulsory contributions in the cooperative. The annual member meeting is measured by the implementation of cooperative management accountability to members. The research data uses secondary data in the form of financial reports and annual member meeting reports. The object of this study was 159 Cooperatives in East Java, Indonesia. This study analysis with diskriptif kualitatif. The results of research on internal control do not affect corporate governance. Member fee rules affect corporate governance and annual member meetings affect corporate governance.

**Keywords:** Corporate Governance, Internal Control, Performance, Women Cooperative, Microfinance

#### 1. Introduction

Cooperative organizations have specific characteristics compared to other organizations. Cooperative organizations have the principle of corporate profits that can be enjoyed by all members of the cooperative. Divided benefits are taken from reports on the remaining results of the business. The component of the story on the remaining business results is the cooperative income of the business minus the operating expenses of the cooperative. The financial performance of the collective management will be accountable to members at the Annual Member



Meeting. The Annual Budget Meeting will discuss the achievements of the previous year's performance and the collaborative business budget plan. Cooperatives are microfinance institutions, having an intermediary function as fund-channeling fund collectors. Cooperative as a function of collecting funds through the payment of principal savings members, mandatory savings, and voluntary savings. Collaborative as a function of channeling funds through giving credit to members. The financial management of cooperatives must be fair, transparent, and accountable. Organizations are microfinance institutions. Gietzen (2017) microfinance institutions face a low risk of liquidity. Microfinance institutions have the potential to maintain liquidity. Microfinance institutions can operate activities in paying off obligations in the short term.

According to Wuryani (2012), a cooperative is a legal entity carrying out cooperative activities based on democracy. According to Law on Indonesian Cooperative No. 17 issued in 2012, a union is a legal entity established by individuals or legal organization. A cooperative has economic, social, and cultural aspects according to its principles. The main goal of a cooperative is to prosper its members. The union has intermediary functions to collect and distribute funds. Members save their money as maximum savings, mandatory savings, and voluntary savings. The principal conservation is the initial money given by the member when registering. Later, the members are possibly to borrow the funds (loan) based on its terms and conditions. No collateral is needed when they apply for the loan. This is one of a cooperative's characteristics as it meets the principles of a cooperative, that is, by and for members.

Essential savings, mandatory savings, and voluntary savings will add assets to the cooperative. The assets owned by organizations are getting bigger, so the opportunity to get cooperative income is getting bigger. Cooperatives will get exciting income from members who borrow money from unions. Collective assets will be channeled to members through credit. Credit distribution to members raises accounts receivable. Cooperatives must manage the accounts receivable well to minimize uncollectible accounts. The cooperative organizational structure consists of collaborative management and cooperative members. The management consists of the Chairperson, Secretary, Treasurer, and Supervisor. Operational activities are contained in the Cooperative Business Budget Plan, which was approved at the Annual Member Meeting. The highest authority is in the members of the cooperative because the policy changes must get the approval of the members through the Annual Member Meeting. Personnel in the organizational structure must run according to their respective duties and functions. Implementation of corporate governance can be carried out if all staff in the organizational structure

perform tasks and functions correctly. Cooperative management must have an attitude of justice, independence, transparency, and accountability. Collaborative management must be professional to improve performance. Shleifer and Vishny (1997) argue that proper organizational management can give trust to the owner about the return on investment invested. In the cooperative, the owner is a member of the collective. Returns on investment in the form of organizations in the way of remaining business results — investment in cooperative members in the form of maximum savings, mandatory savings, and voluntary savings.

Xue & Hong, (2016) Good corporate governance can reduce costs. The company will benefit from good corporate governance. Proper company management will limit management opportunism, especially in revenue. Briozzo et al. (2017) Corporate governance mechanisms in developing countries of small and medium enterprises (SMEs) are interesting to learn, especially from a gender perspective. The relationship between CG and gender, there is no relationship between women's participation at different levels: ownership, the board of directors, senior management, and auditing. It is also interesting to observe that capital concentration decreases because more people participate in ownership. Current and. Ariza, (2016) observable and unobservable institutional factors can influence compliance with Corporate Governance (CG), and some company-specific characteristics can influence CG ratings. Krechovska and Prochazkova, (2014) Good corporate governance and sustainable impact through a sustainable business management process. Toudas (2014) Corporate governance cannot improve performance. Companies must bear market risks. Investors are passive in monitoring and evaluating companies. Gupta and Mirchandani (2019) the results of his research on socially oriented Micro Finance Institutions (MFI) have greater customer reach with a higher percentage of female customers and lower average loan sizes compared to commercially oriented MFIs. Micro Finance Institutions (MFI) that is socially oriented has less cost per borrower and higher self-sufficiency in operations. Social oriented Micro Finance Institutions (MFI) (NGOs and Cooperatives/credit unions) show better social performance compared to commercially oriented MFIs.

Solovjova (2018) Establishment and development of financial centers contribute to economic growth. The establishment and development of commercial centers are influenced by several factors, such as geographical location, multicultural factors, tax and customs policies, immigration laws, competitive costs of financial services, economic, political and social factors. The development of commercial centers requires government support and balanced national policies aimed at increasing the competitiveness of business centers. Loukopoulos (2014)

Strong resource potential is the power to earn income in the long run. Theriou (2015) Implementation of strategies using more financial information. The company also uses non-financial information in developing policies. Fetai (2015) Financial integration and commercial development have a positive effect on economic growth in developing countries and do not influence in developed countries.

Mussa et al. (2015) Corporate governance influences corporate financial decisions. Corporate governance correlates with the responsibility of total company debt. Corporate governance connects with responsibility for the number of dividends paid to shareholders. According to (Cornett et al., 2009) A suitable management mechanism in the company will support the company's performance. (Brown Caylor, 2006) Proper management in the company has a positive effect on company performance. Cornett et al. (2009) describe that corporate governance has a vital role in the production. Wuryani (2012) the application of organizational governance influences performance. Lys et al. (2015) Corporate accountability reporting is information to outsiders about the company's future financial prospects.

Ameer and Othman (2012) The company will improve its financial performance and maintain the business performance that is achieved well. The purpose of this study was to analyze the effect of cooperative governance on the financial performance of rural women's cooperatives in East Java, Indonesia. The policy of the East Java Governor since 2009 established the Women's Cooperative in each village, and there was one women's cooperative. Women's organizations have a purpose to prosper the village community. The Women's Cooperative was established to move the economy in the village through women's empowerment. Women's cooperatives as microfinance institutions have differences with banks. Women's cooperatives when giving loans to members do not need to use collateral. Cooperative governance proxied through internal control, cash flow, organization size, and implementation of member meetings.

## **2. Literature Review**

### **2.1. Agency Theory**

Jensen and Meckling (1976) define agency relationships as contracts where one or more (principals) hire other people (agents) to do some services for their interests by delegating some decision-making authority to the agent. If both parties try to obtain maximum satisfaction, then there is a good reason to believe that the agent does not always act in the interests of the principal. Watts and

Zimmerman (1990) implicitly recognize three forms of agency relations, namely owners and management, creditors with management, and government and management. The notion of principal is not only the owner of the company but also creditors and the government. In carrying out, the work principals need to delegate some decision-making authority to the agent.

Agency problems arise when managers have an obligation to maximize the welfare of shareholders, but on the other hand managers also have an interest in maximizing their health, so that in this case the agent is not in the benefits of optimizing the health of the owner, but has a tendency to pursue his interests at the expense of interests owner. This is usually done by the agent by providing information about the performance results that are not following the actual situation through the use of accounting numbers stated in the financial statements as the basis. Elkelish (2018) agency costs have a significant negative impact on corporate governance risks. The heterogeneous model of corporate governance is caused by a variety of different agency problems in various countries. There are several obstacles to achieving convergence in global corporate governance practices due to various agency problems throughout the country.

The association of agency theory with this study, the application of cooperative governance can reduce agency costs incurred by the company. Usman et al. (2018) the presence of women as directors will benefit from reducing agency costs by reducing the manager's opportunistic behavior and information asymmetry. Hesarzadeh and Bazrafshan (2018) The relationship between CEO ability and risk of regulatory review, negative and also statistically and economically significant for companies with low agent conflict levels and high levels of quality of corporate governance. The results of this study indicate that the relationship between CEO capability and regulatory review risk is positive and also statistically and economically significant for companies with high levels of agent conflict and low quality of corporate governance.

## **2.2. Corporate Governance**

Srivastava et al. (2019) Research show a significant negative relationship between overall corporate governance and equity costs. Srivastava et al. (2018) there is a relationship between corporate governance and company performance. Good corporate governance will protect shareholder rights. Ntongho (2016) Economic considerations are not the only factor in influencing corporate governance regulations, because political and cultural elements are equally essential and culture has proven to be the primary mitigating factor towards convergence of corporate governance rules and principles. Mulcahy and Donnelly

(2015) improved corporate governance significantly more in companies that have weak or extreme governance before losses occur.

### **2.3. Internal control**

Within the cooperative organizational structure, there must be a division of tasks and authority, so that each function can carry out the work correctly and be accountable for the job. Clear duties and powers will facilitate the evaluation or monitoring of responsibilities and authorities. Assessment and monitoring are internal control efforts. Umarovich (2017) Applied financial controls will be more efficient using information systems. Information systems as a means of control in organizations. Miguel (2017) Management accounting is a tool to achieve accountability and control in managing funding sources. Wuryani (2012) Internal control influences financial performance. Cooperatives carry out internal controls, including perspectives on cooperative activities, organizational and business supervision, supervision of financial capital. The implementation of internal controls will run well through the control environment, the application of competencies in cooperatives, the assignment of authority, responsibility, communication, and information. The control environment is the foundation for implementing internal controls. The control environment reflects all behavior, awareness of all elements in the cooperative.

Azim et al. (2017) research on microfinance institutions on governance needs transparency. Research on microfinance institutions about an internal audit is high in minimizing corruption behavior. Suryanto (2016) information systems, company size, operating losses, and profits influence inspection. The examination has the effect of reducing fraudulent financial reporting systems. Michael and Goo (2015) Corporate governance in the areas of family ownership, concentration, self-dealing, executive compensation, and other issues. Excessive executive compensation, accounting, and audit weaknesses do not cause problems. ElKelish (2018) Corporate governance is influenced by internal and external factors.

### **2.4. The annual member meeting**

Cooperative Law No. 17 of 2012 Cooperatives must report responsibly to members on the Annual Member Meeting Report. At the Annual Members' Meeting, the management says the activities of cooperative activities in the form of reports on remaining business results, statements of financial position, capital change reports and cash flow statements. At the annual membership meeting, the business budget plan will be approved for the following year. Members have an essential position in yearly member meetings. Members can provide input and assess the performance of cooperative management. Pang and Yuan (2018) The

composition of the management and commitment of members can contribute to better performance. Atty et al. (2018) there is a significant relationship between CEO duality and company financial performance. This reflects the need to strengthen compliance with the Governance Code related to the duality status of the board of directors. There is a significant relationship between the size of the Board of Directors and the company's financial performance. This shows that larger council sizes are more effective in monitoring financial reporting. There is a significant relationship between Board of Directors meetings and company financial performance. This indicates that the Board of Directors' conference does not affect the company's performance. Usman et al. (2018), the presence of women as directors can provide benefits to shareholders. Hasan and Khalily (2019) Powerful Chief Executive Officer has a positive impact on the financial performance of Micro Finance Institutions (MFI). Gender diversity has a positive effect when balanced with gender diversity in management.

### **2.5. Member Fee Rules**

Cooperative Law No. 17 of 2012 cooperative members must pay basic contributions and mandatory contributions. The basic fee is paid at the beginning of the formation of the cooperative. Contributions must be paid every month. The amount paid on the principal contribution and the membership fee is based on the rules agreed by the member. More and more members will add to cooperative capital because more and more basic contributions and mandatory contributions are received.

## **3. Method**

This research uses census data. The research samples are 159 cooperatives in East Java, Indonesia. One hundred fifty-nine organizations from East Java Indonesia Data analysis using with diskriptif.

The measurement of corporate governance uses a performance evaluation conducted by the Cooperative Office as a cooperative builder

Assessment criteria

a value of 85 -100 is very good

grades 80 - 84 Good

a value of 70 - 79 is quite

a value <70 less

Internal control measurements using audit assessments by the Cooperative Supervisor

Measurement scale:

1. There is an inspection from the supervisor, and there are written and complete reports on the results of the examination, the value of 100
2. There is an examination from the supervisor, and there are reports on the results of the test in writing but not complete, a value of 75
3. There is an inspection from the supervisor, but the inspection report is combined with the Management's story, a value of 50
4. There is a check from the supervisor, but there are no written and complete reports on the results of the examination, the value of 25
5. There is no inspection by the supervisor, a value of 0

It measures the implementation of Annual Member Meetings for assessment when the Cooperative Management is responsible for operational activities for all members.

Measurement scale:

1. Conducted in January, a value of 100
2. Held in February, a value of 75
3. Held in March, a value of 50
4. Conducted from March to June, 25 points
5. Implemented above in July, a value of 0

Repayment of member's Principal Savings and member's Mandatory Savings

Size: The amount of Principal Savings and mandatory savings that have been paid compared to the amount of Principal Savings that should have been repaid.

Measurement scale:

1. 100%, value 100
2. 80% to < 100%, value 75
3. 60% to < 80%, value 50

4. 40% to < 60%, Value 25

5. < 40%, value 0

#### 4. Results

Table 4.1 Corporate Governance

Description	Value	Amount	Percentage (%)
Very good	85 -100	99	62,26
Good	80 - 84	5	3,14
Quite	70 - 79	32	20,13
Less	< 70	23	14,47
Amount		159	100

Table 4.2 Audit Assessments by The Cooperative Supervisor

Description	Value	Amount	Percentage (%)
There is an inspection from the supervisor, and there are written and complete reports on the results of the examination	100	1	0,63
There is an examination from the supervisor, and there are reports on the results of the test in writing but not complete	75	72	45,28
There is an inspection from the supervisor, but the inspection report is combined with the Management's story	50	34	21,38
There is a check from the supervisor, but there are no written and complete reports on the results of the examination	25	52	32,70
There is no inspection by the supervisor	0	0	0
Amount		159	100

Table 4.3 The implementation of Annual Member Meetings

Description	Value	Amount	Percentage (%)
Conducted in January	100	72	45



Held in February	75	33	21
Held in March	50	51	32
Conducted from March to June	25	3	2
Implemented above in July	0	0	0
Amount		159	100

Table 4.4 Repayment of Principal Deposits from members and Mandatory Deposits of members

Description	Value	Amount	Percentage (%)
Repayment 100%, nilai 100	100	140	88
Repayment 80% s/d < 100%	75	5	3
Repayment 60% s/d < 80%	50	6	4
Repayment 40% s/d < 60%	25	8	5
Repayment < 40%	0	0	0
Amount		159	100

## 5. Discussion

Women's cooperatives that received good ratings were 62.26%, meaning that most women's cooperatives had implemented corporate governance. Cooperatives that get a good rating of 3.14%. The cooperatives that get the assessment are quite 20.13%. Cooperatives that get bad ratings by 14.47%. The number of cooperatives that get appraisers is very good and good appraisals are greater than the assessment of sufficient and poor quality.

The cooperatives that supervise and carry out complete records are only 0.63%. Internal control in women's cooperatives has been done but there are still many that have not been recorded as much as 45.28%. This means it is necessary to improve internal control with the administration in terms of administration.

Cooperatives that conduct Annual Member Meetings on time in January are 45%. Cooperatives that hold Annual Member Meetings on time in February by 21%. Cooperatives that hold Annual Member Meetings on time in March are 32%. Cooperatives that conduct Annual Member Meetings on time for assets from March to June are 2%. Cooperatives that conduct Annual Member Meetings on time in July are 0%. This shows that many cooperatives have carried out accountability functions to members.

88% of cooperative members have paid the obligation to pay the principal savings and mandatory savings. Cooperative members of 12% who have not paid

off the principal savings and mandatory savings. This shows the source of capital from members will be used for the benefit of members who need funds. Cooperatives have an intermediary function, namely the function of collecting funds and channeling funds in the form of giving credit to members.

## **6. Conclusion**

The implementation of corporate governance supports the principles of justice, independence, transparency, and accountability. Implementation of Cooperative management in cooperatives can be seen from the activeness of managers and members who support operational accountability of cooperatives. Internal control does not affect corporate governance, this means that in the implementation of cooperative operations, internal control has not gone well. Corporate governance can work well because rural communities lead to the value of honesty. The value of integrity and sense of ownership of cooperatives is very high so that the management in carrying out cooperative operations, based on applicable regulations.

Member fee rules affect corporate governance. Women's cooperatives as savings and loan cooperatives have the task of raising funds and channeling and in the form of loans. The basic contributions and membership fees are paid by members to the cooperative as a form of raising funds. The greater the funds raised, the greater the funds that will be used to lend funds to members. Source of cooperative funds from membership fees. Women's cooperatives have not utilized loan funds from banks to increase capital.

The implementation of member meetings has a positive effect on corporate governance of women's cooperatives. Management responsibilities are conveyed at annual member meetings. The burden of members to carry out obligations as members and take an active role in the operations of cooperatives. The more members participate, the more cooperative capital. Capital is allocated for lending activities to members. The organization has an excellent performance if it can do exercises to get income higher than the operating expenses. Reports on the remaining results of operations will increase with the active role of cooperative members. Business results report will be reported at the annual member meeting. In the meeting, the value distributed to the members will be decided, in the form of spreading the remaining proceeds of the business. Cooperative members feel the benefits of profit sharing. Other benefits of cooperative members, making money for companies do not need to use asset guarantees.

## 7. Acknowledgment

I thank you to the Chancellor, Assistant Chancellor in the academic field, Dean of the Faculty of Economics, Deputy Dean of Academic Affairs, and Chair of the Accounting Department of the State University of Surabaya for the opportunity given to me in the acceleration of Professor. Hopefully, in the MERIA UNESA GUBES program, this article can be entered into with a reputable Scopus.

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## Chapter 18

### Exploratory Study: Analyzing Efficacy of *Salvinia molesta* Mitchell) as Phytoremediator of Lead (Pb)

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**Abstract** - Heavy metals, such as Pb (lead), is generally toxic for human, animal, and plant. Heavy metals can enter organism through food chain in the contaminated water. Thus, improving water quality polluted by heavy metals is necessary, for example by phytoremediation using *Salvinia* (*Salvinia molesta* Mitch.). The objective of this study was to evaluate the ability of *Salvinia* as phytoremediator of Pb. Total protein, free amino acids produced by the plant, and plant growth (dry biomass) was evaluated, while Rhizosphere bacteria on the roots were identified. *Salvinia* was grown in a hydroponic system exposed to lead (Pb) at 0, 5, 10, and 15 ppm for 7 and 14 days. Pb level was analyzed using AAS (Atomic Absorption Spectrophotometer) method, amino acids were analyzed using HPLC (High Pressure Liquid Chromatography), while bacteria were identified using Microbact Identification System method. Data collected, i.e growth and Pb content, was analyzed statistically using Anova followed by Tukey test at 95% confidence level. Bacteria and amino acids were analyzed descriptively. Result showed a significant change of Pb content in the roots and leaves of Pb-exposed *Salvinia* compared to control. Total protein and amino acids, especially cystine, was found to be lowered in Pb-exposed plants. As much as 7 bacteria species were identified from *Salvinia* roots. In conclusion, *Salvinia* could be used as Pb phytoremediator agent due to its ability to absorb Pb and high potential to survive Pb exposure.

**Keywords:** Phytoremediation; lead; *Salvinia*; amino acid; bacteria

#### 1. Introduction

Heavy metal pollution, such as Pb, is environmental issue that has threaten the lives of human, plant, and animal. Widespread burning of fossil fuels and dispose of industrial waste cause Pb and other heavy metals to accumulate on the soil or water body, making it possible to enter food chain (Munzuroglu and Geckil

2002; Zeller and Feller 1999; Shah and Nongkynrih, 2007; Wuana and Okieimen 2011; Ergonul et al., 2019). Heavy metals are known to cause changes in the redox balance of cells, resulting in oxidative stress (Sreekanth et al. 2013). Secondary effect of oxidative stress, such as impaired membrane function due to lipid peroxidation and oxidation of proteins and nucleic acids, interferes a lot of cellular functions (Blokina and Fagerstedt 2010). In plant, short-term response towards heavy metals exposure resulting in morphological, anatomical, physiological, and biochemical alteration (Rai, 2009)

Heavy metals-collecting plant functions as biofilter that can effectively reduce heavy metals concentration in contaminated water (Abhilash et al., 2009; Rai, 2011). Phytoremediation has been applied extensively to remediate either contaminated soil or water in several area (Nouri et al., 2011). Other study also pointed that original species grew in contaminated habitat have potential to act as phytoremediator for certain pollutant (Nouri et al., 2011).

Salvinia is a pteridophyte plant from Salviniiales group, an invasive species of aquatic weed live floating on water surface. Salvinia is mostly found in ditches or trenches, rice fields, ponds, lakes or streams with slow water flow, and irrigation channels. Its rapid growth rate allows Salvinia to slowly cover water surface, forming a solid layer with thickness up to 1 m, depending on duration and compaction. This plant is mostly found in East Surabaya. Community used it as ornamental plant, as well as animal food. However, Sari (2014) found that Salvinia could effectively absorb copper (Cr) from batik industrial waste. Based on this study, Salvinia showed signs of "resistance" towards heavy metals and could be classified as "accumulator/hyperaccumulator" plant. Selected plants exhibited a wide range of stress tolerance to all of the metals and therefore might be utilized for eco-removal of heavy metals from contaminated water (Rai, 2018).

Plant can act as bioremediator because they produce specific protein-forming free amino acids necessary in responding heavy metals presence in their environment. One of the purposes of amino acids synthesis by plants is to detoxify heavy metals by forming complexes with heavy metals in plants (Pilon, 2005). Heavy metal accumulation in wetland plants is known to produce substantial physiological and biochemical responses towards the growth of roots, stems, and leaves (Rai, et al., 2009; Lyu et al., 2016). Biochemical parameters, such as protein, sugar, and chlorophyll content of plants, are generally decreased in plant tissues after several days of exposure period. In this context, eco-remediation of hazardous chemicals through wetland plants may obviously be reflected in the form of certain physiological and biochemical changes to cope with heavy metals stress (Ray, 2019). Therefore, it is necessary to study the ability of plant to adapt to metal



exposure from contaminated water and to distribute metal ions in their organs, from root to shoot, which is determined by free amino acid analysis (Kamel, 2008).

In addition to amino acids production, plant ability in remediation are also assisted by rhizosphere bacteria. Pollutants are decomposed by microbes in the soil, which are then reinforced/synergized by yeast, fungi, and plant root substances (exudate). Result of this decomposition process will then be released into root zone of plants (Cluis, 2004; Komives and Guliner, 2000; Ghosh and Singh, 2005; Tangahu, et al., 2011).

Based on previous elaboration, the main objective of this study was to determine whether *Salvinia* was able to function as heavy metals Pb phytoremediator. The specific objectives of this study were to evaluate the ability of *Salvinia* to absorb Pb, to evaluate free amino acids produced by the plants, and to identify Rhizosphere bacteria on roots that possibly assist the plants in phytoremediation.

## **2. Material and method**

### **2.1. *Salvinia* Growth and Pb-Exposure**

This study was designed as completely randomized block design with three replications. Two factors of treatment were applied: Pb concentration (K1: 0 mgL<sup>-1</sup>, K2: 5 mgL<sup>-1</sup>, K3: 10 mgL<sup>-1</sup>, K4: 15 mgL<sup>-1</sup>) and exposure time (7 and 14 days). Each factor combination was carried out for three replications.

*Salvinia* was collected from Porong wetlands in Sidoarjo region, East Java, Indonesia. Experiment was initiated by acclimating plants and reducing contaminant level in the plants by growing *Salvinia* in a plastic chamber filled with 20L Hoagland's medium within green house for a period of 7 days. After that, *Salvinia* was sorted at 90 g for respective treatment. Each plant was maintained for 10 days in different plastic container filled with 20 L distilled water and supplemented with Hoagland's solution (Göthberg et al., 2004).

Acclimated plants were rinsed using distilled water and moved into a 40x30x35 cm glass aquarium filled with 5 L distilled water and Hoagland's solution with Pb level set according to respective treatment. Each aquarium was filled with 100 g *Salvinia*. pH at the initial and the end of experiment was recorded. Plants were given 12:12 hours light-dark cycle daily with 389-candles photon flux density. All plants sample were harvested according to exposure time set (7 and 14 days), then plant biomass was recorded. Pb Level Measurement in *Salvinia*

After *Salvinia* was harvested, its phytoremediation ability was determined by measuring Pb absorption in roots and leaves using extraction method (Gothberg

et al., 2004). Harvested plants were separated into roots and leaves. Each part of plant was dried in oven at 80 °C for 48 hours, then weighed its dry weight. Next, 5 g of each plant organ sample was taken and grinded using a mill. After that, 0.5 g of each powdered plant sample was diluted into 5 ml HNO<sub>3</sub> and 50 ml deionized double distilled water. 50 ml of respective diluted sample and medium was analysed using Atomic Absorption Spectrophotometer (AAS) to record its Pb level. Total accumulation and partitioning of heavy metals by the plants were calculated.

## **2.2. Free Amino Acids Identification and Level Measurement**

Protein-mapping pattern of Pb-exposed *Salvinia* was also evaluated from free amino acids and the total proteins content of plant roots using HPLC method with hydrolysis processes and derivatization (Waters, 2017). Reagent kit (AccQ-Fluor™ Reagent Kit for hydrolysate amino acid Analysis) was prepared first by heating it at 55 °C. AccQ fluo reagent powder was heated 2-3 minutes. Then, 1 ml of AccQ fluorine reagent diluent was put into vial 2A followed by heating and mixing until all the powder was spread evenly. Next, solvent was prepared by diluting 19 g sodium acetate and 2.27 g TEA into 1 L distilled water. 40% phosphoric acid (+6 mL or above) was added until pH reached 5.1 then followed by adding 5 mL acetonitrile and distilled water.

Hydrolysis of sample was conducted to 100 mg sample. Sample was placed into a tube and added with 5 mL 6 N HCl. Sample was dried using nitrogen or argon. Respective tube was covered and placed into oven at 112°C for a period of 22 hours. Sample was then filtered using 0.45 µm filter paper. Then, 100 ml filtered sample was dissolved into 5mL MilliQ water.

For derivatization, 50 µL diluted sample was mixed into 350 µL AccQ derivatization buffer and 100 µL AccQ fluor reagent. Mixture was shaken briefly and put into heated water at 55°C for 10 minutes. Finally, sample was injected into HPLC instrument (Waters, 2017).

## **2.3. Identification of Rhizosphere Bacteria in *Salvinia* Roots**

Bacteria in the *Salvinia* roots were also identified. Rhizobacterial isolation was performed by homogenizing 10 grams of root sample and growing it in sucrose-free Czapek Broth medium with addition 10 mgL<sup>-1</sup> Pb-acetate. Samples were incubated and inoculated using pour plate method. Growing bacteria were inoculated on test tube containing KNA medium to obtain pure isolate. Bacteria colonies were morphologically observed, Gram-stained, and physiologically tested. Morphological observations include following parameters; (1) shape of colony, (2)

colony diameter, (3) colony color, (4) colony edge, and (5) elevation. Microbial psychological test used was Microbact Identification System.

### 3. Data analysis

Parameters observed in the current study were: (1) dry weight, (2) Pb level in roots and leaves, (3) free amino acids level in roots; (4) bacteria species in the roots. Qualitative data of dry weight and Pb level were analyzed using one-way ANOVA and followed by Tukey test at 95% confidence level using SPSS 21st edition statistical software. Free amino acids were analyzed descriptively based on the percentage and total protein. Bacteria species isolated from *Salvinia* roots was analyzed descriptively.

## 4. Results and discussion

### 4.1. Growth of Plants Exposed to Pb

Current study found that there was significant difference in the growth of plant given various Pb concentration, while no differences of growth was found based on exposure duration (7 days vs. 14 days) (Fig 1). *Salvinia* dry weight was affected by Pb concentration in growth medium (Table 1). Medium pH was also found to change, from 5.4-6.9 at the initial of experiment, to 6.5-7.0 towards the end of experiment.

Table 1. *Salvinia* dry weight (g) after Pb exposure for 7 and 14 days

Pb Concentration (ppm)	Dry weight (g)	
	7 days	14 days
0	6.50±0.65 <sup>c</sup>	6.00±0.15 <sup>c</sup>
5	6.76±0.65 <sup>c</sup>	6.26±0.15 <sup>c</sup>
10	5.06±0.27 <sup>b</sup>	4.56±0.27 <sup>a</sup>
15	4.41±0.37 <sup>a</sup>	3.91±0.37 <sup>a</sup>

Different letters indicate statistical difference based on Tukey test (p=0.05).

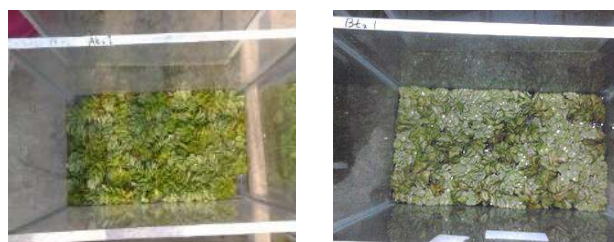


Figure 1. *Salvinia molesta* plant from control and experiment group

According to biomass weighted after treatment, *Salvinia* were able to grow adequately in Pb-contained medium. However, *Salvinia* biomass was reduced more the higher Pb concentration added to medium. Phetsombat, et al. (2006) who study *Salvinia* plant group exposed to Pb at concentration of 10, 20, 30, 40 mg L<sup>-1</sup> with exposure duration of 2,4,6, and 8 days also found decreasing growth. This was in line with Hardiani, et al. (2011) who mentioned that plants adapting to high-grade heavy metals medium and tolerant towards heavy metals content commonly grew slowly. Other studies, in the other hand, such as Gothberg et al. (2004) who grew Pb-exposed water spinach supplemented with various concentration of Hoagland nutrients, Abhilash et al. (2009) who studied Yellow velvetleaf exposed to Cd with concentrations of up to 2 mgL<sup>-1</sup>, Rachmadiarti et al. (2012) who grew Yellow velvetleaf exposed to Pb at concentration up to 15 mgL<sup>-2</sup>, and Rachmadiarti and Trimulyono (2019) who examined water clover exposed to Pb, found that various plant species could grow positively even in the presence of heavy metals.

#### 4.2. Distribution of Pb in Plant Organs

Plant growth was accompanied by Pb removal from growth medium. Pb was absorbed into plants and translocated into various plant organs. In this study, we investigated Pb distributed to roots and leaves of *Salvinia* plants (Table 2).

Table 2. Pb content in roots and leaves of *salvinia* plant after 7 and 14 days exposure

Pb Concentration (ppm)	Pb content			
	7 days		14 days	
	Roots	Leaves	Roots	Leaves
0	0.00±0.00 <sup>a</sup>	0.00±0.00 <sup>a</sup>	0.00±0.00 <sup>a</sup>	0.00±0.00 <sup>a</sup>
5	4.40±0.05 <sup>c</sup>	2.20±0.05 <sup>b</sup>	4.81±0.20 <sup>c</sup>	2.95±0.08 <sup>b</sup>
10	4.24±0.03 <sup>c</sup>	2.22±0.01 <sup>b</sup>	4.73±0.50 <sup>c</sup>	2.99±0.07 <sup>b</sup>
15	3.85±0.03 <sup>b</sup>	2.24±0.08 <sup>b</sup>	4.40±0.49 <sup>c</sup>	2.85±0.03 <sup>b</sup>

Different letters indicate statistical difference based on Tukey test (p=0.05)

Result of Pb content analysis in the roots of *Salvinia* showed significantly higher concentration of Pb absorbed, but there was no difference for the duration of exposure. The higher the concentration of Pb in the medium, the higher Pb level concentrated in the roots of the plant (Xin, et al., 2010). The longer the exposure time (up to 14 days), the higher the Cu level absorbed from 8 ppm Cu added into the medium. Meanwhile, Zou et al. (2011) found correlation between Pb concentration in medium and duration of exposure with Pb content in herbaceous dicotyledoneae plants *Carpesium abrotanoides*, *Conyza Canadensis*, *Anemone*

vitifolia, monocotyledoneae *Juncus effusus*, and pteridophytes *Athyrium wardii* and *Pseudocyclosorus subochthodes*. Another research noted that the final Pb removal percentages was up to 94% in *Lemna gibba* L. after 21 days of exposure (Bokhari, et al. 2019).

Salvinia are pteridophyte with monopodial small-diameter roots, thin-walled epidermis with the cortex consists of sclerenchyma or parenchyma combined with sclerenchyma, and stele diarch or tetrarch. Previous study mentioned that the ability of plants to remove heavy metals was strongly influenced by their morphology (Schuck and Greger, 2019). The ability of *Salvinia* to accumulate Pb in higher level in roots compared to leaves was related to root function in the plant to immobilize toxic ion from Pb heavy metals in planting medium by accumulating, adsorbing on root surface, and precipitating the pollutant at the root zone. After phyto-stabilization had occurred, the roots acted as rhizofilter that absorbs Pb toxic ions. Compared to other plant organs, the roots had higher potential to absorb Pb content in ions and inorganic salts forms. Increase of Pb level at the roots is caused by Pb accumulation process in the roots (Mangkoedihardjo, 2010).

This heavily loaded environment caused regulatory proteins of this plant expressed in such so they can form sulfide bonds at the tip of sulfur in cysteine when Pb and other heavy metals present, inducing complex compounds formation. Thus, lead and other heavy metals will be carried over to various plant tissues.

There was no difference of Pb level in the *Salvinia* leaves given various Pb concentration at different duration of exposure. Pb content was higher in roots compared to leaves (Pourrut, et al., 2011). The root capability of concentrating Pb metals over leaves and stems is related to the plant's root function in adsorbing the water surface, precipitating pollutant, and accumulating pollutant in the root zone (Salakinkop & Hunshal, 2014; Lyu et al., 2016). This process is then followed by rhizodegradation, which is a stimulation for decomposition performed by various microorganisms, mainly rhizosphere bacteria, who then will release their products into root zone.

#### **4.3. Plants Biochemical Response**

Protein mapping patterns of *Salvinia* based on free amino acids and total proteins were examined (Table 3). Different total protein marked plant responses towards environmental changes. Increase and decrease of certain amino acids (proline and cystine) signified protein resistance and degradation due to environmental quality alteration.

Table 3. Amino acid content of Pb-exposed *Salvinia* plant

Amino acid	Content (%) in Pb-exposed plant		
	0 ppm	5 ppm	15 ppm
<b>Histidine</b>	<b>0.42±0.02</b>	<b>0.26±0.02</b>	<b>0.25±0.02</b>
Threonine	0.92±0.00	0.45±0.00	0.49±0.02
<b>Proline</b>	<b>0.71±0.02</b>	<b>0.48±0.02</b>	<b>0.41±0.02</b>
Tyrosine	0.53±0.02	0.27±0.02	0.30±0.02
Leucin	1.39±0.02	0.91±0.02	0.77±0.02
Aspartic acid	1.16±0.02	0.79±0.02	0.74±0.02
Lysin HCl	0.56±0.02	0.40±0.02	0.37±0.02
<b>Glycine</b>	<b>1.09±0.02</b>	<b>0.66±0.02</b>	<b>0.62±0.02</b>
<b>Arginine</b>	<b>0.91±0.02</b>	<b>0.55±0.02</b>	<b>0.50±0.02</b>
Alanine	0.84±0.02	0.59±0.02	0.50±0.02
Valin	0.77±0.01	0.50±0.01	0.42±0.01
Isoleucine	0.63±0.01	0.41±0.01	0.35±0.01
Phenylalanine	1.13±0.01	0.61±0.01	0.59±0.01
<b>Glutamic acid</b>	<b>1.49±0.02</b>	<b>1.04±0.02</b>	<b>0.91±0.02</b>
Serine	0.90±0.00	0.47±0.00	0.49±0.00
Methionine	0.23±0.02	0.11±0.02	0.10±0.02
<b>Cystine</b>	<b>0.01±0.00</b>	<b>0.00±0.00</b>	<b>0.00±0.00</b>
<b>Total</b>	<b>13.69</b>	<b>8.51</b>	<b>7.83</b>

Total protein of control *Salvinia* (0 ppm Pb) was found to be higher (13.69%) compared to plants exposed to 5 ppm Pb (8.51%) and 15 ppm Pb (7.83%) (Table 3). Several amino acids were also found to be lowered after plants were exposed to Pb, such as: proline, glycine, arginine, histidine, glutamic acid, cysteine.

The total percentage of amino acids in *Salvinia* decreased along with increase of Pb concentration at exposure time up to 14 days. The higher the concentration of Pb added to medium, the lower the percentage total protein from plants. This is supported by studies on algae which found that total protein content of *Chlorella vulgaris* decreased in artificial medium exposed to metals (Afkar et al., 2010). Other study has also shown that no change in total protein content occurred in Co-exposed *Chlorella vulgaris* cells. This means that accumulating heavy metals at low concentration in proteins or increasing their respiration by utilizing carbohydrates with the advantage of protein accumulation might be one of the way organisms able to negate their toxic effect (Osman et al., 2004; Sadvakasova et al., 2018). Result of this study are in line with Andra, et al. (2010) who found the role of phytochelatin in inducing Pb-tolerance in vetiver grew in contaminated medium. From amino acids analyzed, there were 6 known amino

acids that play important role in regulation of osmotic plants (Mansour, 2000). Those six amino acids are arginine, proline, leucine, valine, serine, and glycine. At *Salvinia*, proline concentration tended to decrease. The roots were able to extract Pb from the medium and adapt to this condition by producing these amino acids. The plant was also found to contain arginine. Arginine is involved in the synthesis of polyamine, which acts as a signaling molecule (molecule signal) and antioxidative agent (Sharma and Dietz, 2006). This means that plants are able to withstand stress by producing antioxidants.

#### 4.4. Bacteria Identified from the Root of *Salvinia*

Several bacteria contained in the roots of *Salvinia* was also identified (Table 4) as they possibly assisted the plants in Pb removal. Bacteria found in the root of *Salvinia* including *Enterobacter aerogenes*, *Pseudomonas pseudomallei*, *Bacillus brevis*, *Bacillus subtilis*, *Bacillus badius*, *Bacillus sphaericus*, and *Pseudomonas stutzeri* (Table 4).

Table 4. Bacteria species identification from *Salvinia* roots

Characters	Characteristics								
	Circular	irregular	circular	irregular	irregular	irregular	irregular	Irregular	Circular
Colony shape	Circular	irregular	circular	irregular	irregular	irregular	irregular	Irregular	Circular
Elevation	Convex	raised	convex	flat	flat	raised	flat	Raised	Raised
Edge	Entire	serrate	Entire	serrate	serrate	serrate	serrate	serrate	Entire
Color	Yellow	yellowish white	White	yellowish white	white	yellowish white	white	yellowish white	White
Transparency	opaque	translucent	opaque	opaque	opaque	translucent	translucent	opaque	Translucent
Surface	smooth	smooth	smooth	coarse	coarse	smooth	smooth	coarse	Smooth
Gram staining	negative	negative	positive	positive	positive	negative	negative	positive	Positive
Cell shape	Bar	bar	Bar	bar	bar	bar	bar	bar	Bar
Cell composition	diplobacilli	streptobacilli	diplobacilli	monobacilli	monobacilli	diplobacilli	diplobacilli	monobacilli	Streptobacilli
Species identification	<i>Enterobacter aerogenes</i>	<i>Pseudomonas pseudomallei</i>	<i>Bacillus brevis</i>	<i>Bacillus subtilis</i>	<i>Bacillus badius</i>	<i>Pseudomonas pseudomallei</i>	<i>Pseudomonas pseudomallei</i>	<i>Bacillus sphaericus</i>	<i>Pseudomonas stutzeri</i>

Bacteria species identified from *Salvinia* roots were able to live in medium contained Pb up to 15 ppm, which was also non-toxic to *Salvinia* plant. These species have potential to be used as bioremediation agents for wetland or aquatic reclamation. Bacteria are able to eliminate metals and radionuclides by changing their oxidation states, which results in the element being either dissolved, i.e., becoming able to be transported, or is precipitated i.e., immobilized (Tabak et al. 2005; Van Hullebusch et al. 2005). A few bacterial species, such as *Enterobacter*, are capable of pollutant-degradation and metal-reduction in contaminated soil and water (Rehman, et al, 2019). However, it is necessary to improve the ability of these bacteria and require further testing, such as the effect of these bacteria on the

growth of *Salvinia*. Several types of heavy metal resistance mechanisms that bacteria can perform including biotransformation through oxidation-reduction, bioprecipitation in which metal ions are precipitated on the cell surface via cation efflux or pH alteration, and biosorption in which uses natural or recombinant bacterial biomass for ionic metal adsorption (Prasetyawati 2009; El-Shanshoury et al., 2013). Bacteria resistant to heavy metals are thought to have potential as biosorbents and bioaccumulators that can be utilized as bioremediator agents of heavy metal pollution. These bacteria may conduct biotransformation, bioadsorption, biosorption and bioaccumulation mechanisms, either physically, mechanically, or enzymatically.

Microbes associated with vegetation rhizosphere are often known as Plant Growth Promoting Bacteria (PGPB). According to Sari (2014), some species of *Bacillus* can be categorized as PGPB. *Pseudomonas putida*, *Azospirillum brasilense*, and *Enterobacter cloacae* are also thought to be PGPB. In general, PGPB can promote plant growth by facilitating various nutrient sources (N, P, and other minerals), modulating level of vegetation hormones, or indirectly reducing inhibitory effect of various vegetation growth pathogens, or known as biocontrol agent (Saadani et al., 2019). PGPB bacteria have several mechanisms of resistance towards heavy metals; immobilizing, mobilizing or transforming heavy metals and reducing their toxicity to plant-tolerated range of heavy metal ions uptake (Achmad 2004). According to Grandlic, et al. (2008), PGPB can perform phytoextraction and phytostabilization. The application of PGPB for phytoextraction is meant to improve the mobility or bioavailability of contaminants, thereby increasing accumulation of metals in the vegetation part as well as increasing vegetation biomass. PGPB can also perform phytostabilization, which is to act as vegetative cap to stabilize heavy metals in the rhizosphere, thus triggering plants' succession to climax in contaminated metal areas. PGPB triggers vegetation growth by generating ACC-deaminases that promote root elongation and general vegetation growth in heavy metal-contaminated soil but forgoing extraction, or by reducing toxicity of heavy metals by lowering vegetation sensitivity towards higher level of heavy metals.

## **5. Conclusions**

In conclusion, *Salvinia* (*Salvinia molesta*) was found to have potential as phytoremediator for Pb-contaminated water, indicated by its ability to grow adequately in Pb-contained medium and absorb Pb from the environment into its body. Pb content in plants was found to be higher in roots compared to leaves. Total proteins and several amino acids in Pb-exposed plants were lowered,



indicating mechanism of plant adaptation towards alteration of its environment. As much as 7 species of bacteria were identified from *Salvinia* roots, which possibly assisted the plants in phytoremediation. It is imperative to investigate further the phytoremediation capability of *Salvinia molesta*, by increasing heavy metals level in medium in the smaller time frame, and the remediation mechanism occurs within plant body.

## 6. Acknowledgments

Authors would like to thank Research and Community Service Directorate (DRPM) of the Ministry of Research, Technology, and Higher Education (RistekDikti) for funding this study via Fundamental Research Funds of 2015-2016.

## 7. Conflict of interest

The authors declare that there is no conflict of interest.

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## Chapter 19

# Development Of Athlete Registration System For Sports Multi-Sport Event: A Case Study Of Indonesia Sporting Event

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**Abstract** - The aims of this research are to simplify the registration system of Indonesian sports multi-event participants by reducing counterfeiting participant data directly through the data-based website application named NION (Nomor Induk Olahragawan Nasional). The research method uses developmental research with descriptive qualitative methods with internal validation in national multi-sport event in Indonesia. The results of this research received an assessment of very good categories of 6 people (55%), Good Category as many as 3 people (27%) and sufficient categories as many as 2 people (18%) in the first trial. And the results of the and the second trial received an assessment of very good categories of 10 people (91%) and good categories as many as 1 person (9%). The conclusions of the study stated that the development of the registration system model for Indonesian multi-event sports participants using NION data-based website applications conceptually and practically was very well received.

**Keywords:** Model development, participant registration system, website application system.

### 1. Introduction

Success in elite sport can make the country to have international prestige (Allison & Monnington, 2005). In modern country, Elite sports is regarded to

building and maintaining the unity (Giulianotti & Robertson, 2007). Sports have different ways to create sense of union and national cohesion. (Lechner, 2007). Therefore the Indonesian Government make athlete support and development program for elite athlete. The results are not constantly same every years

It is believe that one of the causes of national sports achievement because the implementation of competitions / championships was not good. Facts on the ground indicate that the implementation of a single championship (multi event) or many sports (multi-event) Indonesia, such as O2SN, Pospenas, Popnas, Youth PON, Pomnas, and PON, always raises problems. Starting from management problems, the direction, stages and objectives of the championship itself, the quantity and quality of workforce, availability of competition and supporting facilities, age group determination and age limit of participants, validity validation system and participant registration system, etc. seemed to be ineffective and efficient in supporting the national sports achievement development system.

One of the problems and the focus of this research is the problem of the registration system of participants in multi Indonesian sports events. The focus of the research is the development of participant registration system models using NION data-based website applications. This model development system is a registration system using a website application with data from the system, validating the validity of direct participants that are already on the NION list.

Indonesian multi-event sports participants uses a delayed validity validation system, even though the registration system has used the information technology (IT) model online. The adverse impact of the registration system of factual models, every implementation of multi sports events is still found to falsify participant data from the place, date, month and year of birth. Then falsification of home address data and educational background and other data. The facts in the field of the validity validation system are delayed and the registration system uses a manual system, using information technology (IT) or combined systems is still not effective and efficient. The process of validating the authenticity of participant data, through a repetitive system in accordance with multi-event names, levels and scope of implementation. Validity validation system participants still use the delay model. (Jawa pos, 2012; Jawa Pos, 2013; Jawa Pos, 2014)

The description of the validation process of the Indonesian multi-event sports participants (factual), can be described in the form of a chart in Figure 1 below :



Figure 1. The process of validating the validity of participants in factual sports events.

The validation description of the multi-sport event participants above shows that if athletes will take part in all Indonesian sports events (factually), the participants will undergo a validation process / verify the validity of the original file, 24 to 32 times. This number can occur if multi factual sporting events are 6 to 8 multiplied by 4 levels starting from the district / city, province, region of national level. The description of the process flow validation of the validity of the original files of the multi-event Indonesian sports participants (factual) from the old model to the new model (getting NION) can be seen in Figure 2. following :



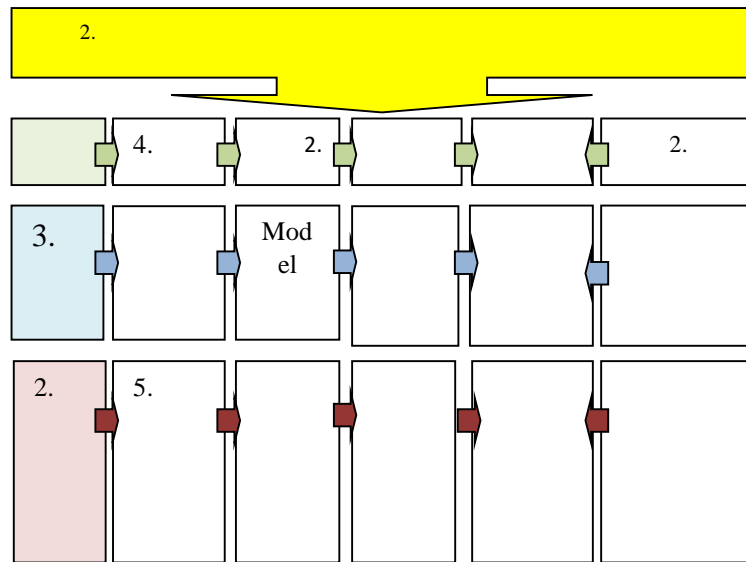


Figure 2. The process of validating validity and registration of participants in multi sport events, factual models and model development

The problem of system validation or verification of the validity of factual multi-event sports participants has been completed by developing a data-based online model through the Imam Marsudi Dissertation (2016) research. The results of the Dissertation research produced a system of examining the participants' validity requirements directly by the assigned officers, the validation / verification process of the participants' validity took place once, not repeated and the original files of the participants were not prone to loss, further guaranteeing the data of participants, fulfilling the requirements given numbers national sportsman parent (NION) thus the validity process of the participant's validity is far more efficient and effective.

The product display of Imam Marsudi's Dissertation (2016) research results in the form of NION as shown in Figures 3 and 4 below :

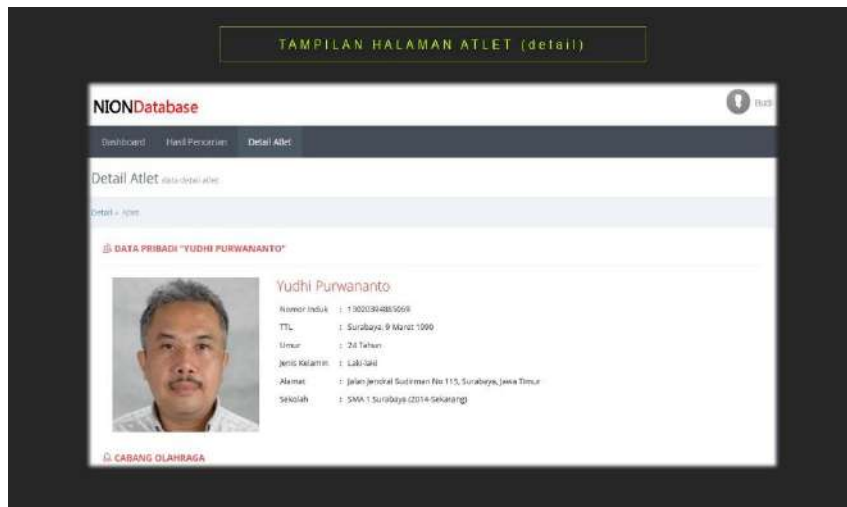


Figure 3. Detailed athlete page views.



Figure 4. Athletes page details (continued)

The next problem that arises is how the registration process for multi-sport event participants by utilizing NION in the form of a simple, fast, inexpensive, right on target and remains based on online information technology (IT) systems. Regarding the problems mentioned above, the focus of this research is the development of a registration system model for participants of multi Indonesian sports events using the NION data-based website application.

The description of the specification of the development of this research model, is as in table 1 below,

Table 1. Product Specifications Developed in the Study

N O	SYSTEM MANAGEMENT	OLD MODEL	DEVELOPMENT MODEL (UPDATED)
1.	Registration for multi sport event participants	<ul style="list-style-type: none"> <li>➤ Manual, IT and joint systems</li> <li>➤ Validation of file validity requirements of participants using the delay system (striking after registration) is done repeatedly</li> <li>➤ Computer</li> <li>➤ Complex, heavy and worked in very limited time, the truth is still in doubt.</li> <li>➤ The ID Card printing process takes a relatively long time</li> </ul>	<ul style="list-style-type: none"> <li>➤ Based on online systems / IT</li> <li>➤ File validation of participants' validity requirements using the system directly and once</li> <li>➤ Use NION</li> <li>➤ Website Application</li> <li>➤ Simple, lightweight can be done anywhere</li> <li>➤ Utilizing population numbers (NIK) and (NIS)</li> <li>➤ Computer and mobile phone</li> <li>➤ ID Card printing process is fast, precise and easy</li> </ul>

The registration system for Indonesian multi-event sports participants, the product of this research, is in the form of a simple, easy and fast application. Officers / Trainers / Athletes of multi-sport event candidates, just enter or enter NION numbers, sports and the type or number of matches that are followed, processed in the application system that is already available, then print ID Cards or participant signs as participants of multi sport events which is held. In another part of the entry results or entering the participant registration data, the total number of participants can be directly identified, the list of names by the sports branch and a list of names and number of participants by name.

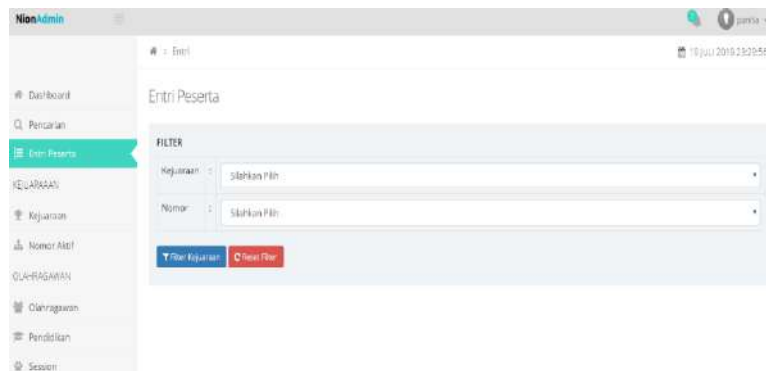
From these data it can automatically be used as data in the field of competition during sports engineering meetings, for the process of scheduling matches, and can be used in the fields of accommodation, consumption, transportation, security and other fields. The registration system for multi-sport event participants with the NION data-based website application as the development of this research model are as follows:

Flow to Register for Sports Multi Event Participants

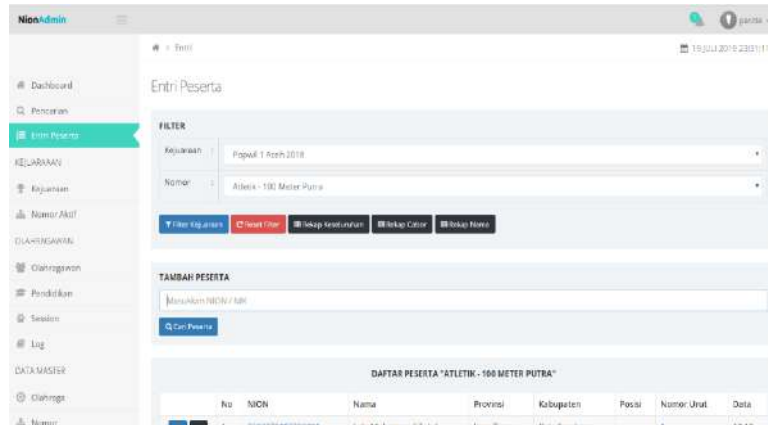
1. Open the NION webpage and log in to the NION account



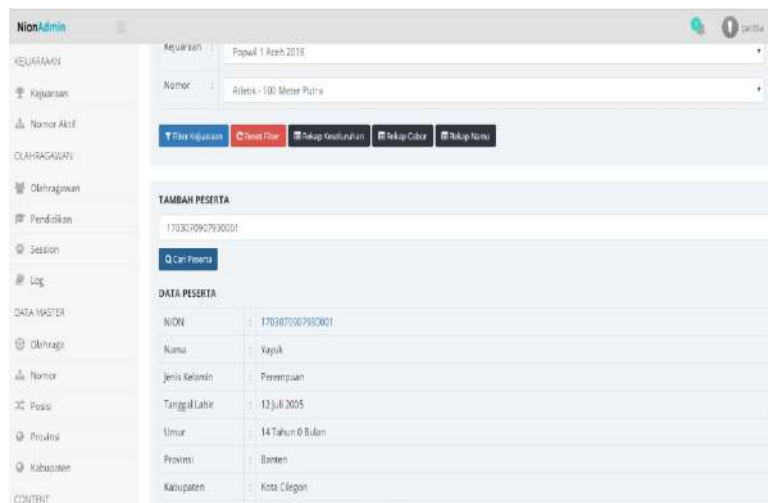
- a. Enter the Entry Peserta menu on the left



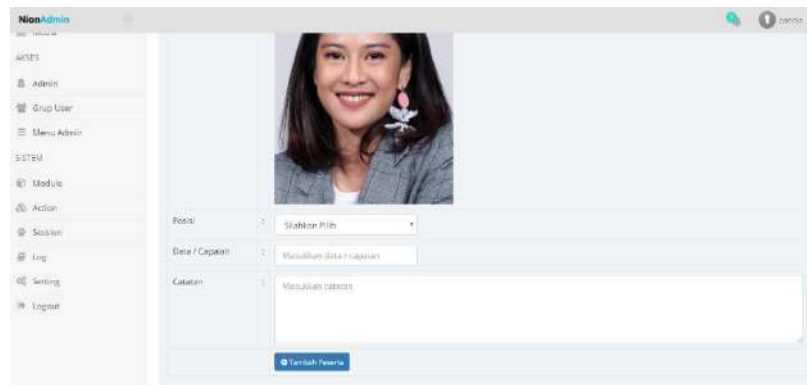
- b. Select Kejuaraan and Nomor Kejuaraan
- c. Click Filter Kejuaraan icon



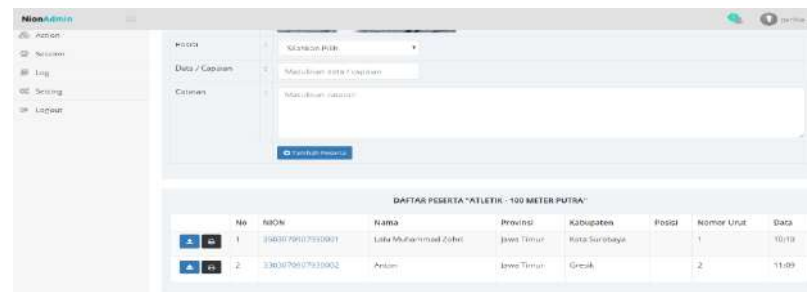
- d. Enter the NION number on the input provided, then click the search button for the participant



- e. Fill in the required data and press the add participant button



f. Then the data will be added to the list of participants below



## 2. Literature Review

Website application system, consisting of syllable systems, applications and websites. The system is a term from the Greek "system" which means a set of parts or elements that are interconnected regularly to achieve goals. Understanding the system according to Satzinger, Jackson, & Burd (2010) is a collection of interrelated components that function together to achieve some results. While the opinion of O'Brien, & Marakas (2009) is a group of components that are interrelated and work together towards a common goal by accepting input and producing output in the process of managing transformation or change. Romney and Steinbart (2006) argue that, a system is a collection of two or more components that interact to achieve goals.

The system consists of smaller subsystems, each carrying out important functions and supporting a larger system. Based on the opinions above, it can be concluded that the definition of a system is a collection of components that have a unit and are related to one another and have the same function. The system is a group of elements that are integrated with the same intent to achieve a goal. According to Abdul Kadir (2003) System is a group of interrelated or integrated

elements intended to achieve a goal. System is a collection of groups of elements that are interconnected and work together to achieve a desired goal and target.

An application is a collection of programs created to do the specific work ordered by the user. Applications are software is made to simplify human work, help and speed up the human work process, applications can also create more accurate results in solving problems.

A website or site can be interpreted as a collection of pages that display information on text data, still or motion picture data, animated voice data, videos and or a combination of all of them. Both static and dynamic forms a series of interrelated buildings, each of which is connected to a network of pages (Permana, 2012).

So a website application system is a set of parts or elements that are interconnected regularly to achieve goals through special work that can be governed by the wearer, in the form of a collection of pages that display information on text data, still or motion picture data, animated voice data, video and or a combination of all. In this model development research the website application system in question is a collection of interconnected elements to achieve the goal of registering participants in multi-sport events or championships in many sports properly and correctly.

### **3. Methodology**

This research is developing research using descriptive qualitative methods through internal, external validation and model dissemination using purposive sampling, through focus group discussion (FGD) and model trials.

This research develops a multi event registration system using a national sports number (NION) data base website application system. There are two products produced in this study. First is hardware in the form of a manual (manual handbook) how to register participants for multi-sport events online with a NION data-based website application system. Second in the form of software (software), namely the application of multi-event participant sports registration website.

The first trial subject (1) is a registration system for multi-pilot sports event participants, by competing in only five sports, consisting of Athletics, Swimming, Volleyball, Badminton and Pencak Silat. After testing the first model, an evaluation, discussion and revision of the first model development models (internal validation) was conducted. Then a second trial and FGD was conducted with the participants in the Aceh Province Regional Student Sports Week (Popwil) I in 2018 (external validation).

The data collection instrument of this study uses assessments in FGD (Focus Group Discussion) on the results of model 1 and 2 trials. The assessment instrument is in the form of a checklist, then all the assessment answers are calculated in terms of the number of tabulations and percentages. (Arikunto, 2006; Sugiyono, 2014).

#### 4. Results

Development of a multi-event sports participant registration management model using NION, as in tables 2 and 3 below.

Table 2. Results of Model Assessment in the FGD and Trial 1 (Internal Validation).

NO	Peserta FGD	SK	K	C	B	SB	KET
1	Subyek A					V	
2	Subyek B				V		
3	Subyek C					V	
4	Subyek D					V	
5	Subyek E			V			
6	Subyek F					V	
7	Subyek G				V		
8	Subyek H					V	
9	Subyek I					V	
10	Subyek D			V			
11	Subyek K				V		
	Tabulasi			2	3	6	
	Jumlah penilaian pengembangan model keseluruhan	Sangat Baik ( 6 org) 55 %				Perlu perbaikan model	
		Baik ( 3 org) 27 %				(ctt proteksi data peserta tdk	
		Cukup ( 2 org) 18 %				Dapat entry 2 x)	

**Keterangan:**

SK : Sangat Kurang

B : Baik

K : Kurang

SB : Sangat Baik

C : Cukup

Table 3. Results of Model Assessment in the FGD and Trial 2 (External Validation).

NO	Peserta FGD	SK	K	C	B	SB	KET
1	Subyek AA					V	
2	Subyek BB				V		
3	Subyek CC					V	
4	Subyek DD					V	
5	Subyek EE					V	
6	Subyek FF					V	
7	Subyek GG					V	



8	Subyek HH					V		
9	Subyek II					V		
10	Subyek DD					V		
11	Subyek KK					V		
	Tabulasi suara				1	10		
	Jumlah pengembangan keseluruhan	penilaian model	Sangat Baik ( 10 org)/ 91 %				Model bisa digunakan entry	
			Kurang ( 1 org)/ 9 %				By name peserta multieven or	

**Keterangan:**

SK : Sangat Kurang

B : Baik

K : Kurang

SB : Sangat Baik

C : Cukup

**5. Conclusion**

The development of a multi-event Indonesian participant sports registration system model using the NION data-based website application, conceptually and practically can be very well received.

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## Chapter 20

# Performance Of Disc And Doughnut Baffle Using Various Spacing On Shell And Tube Heat Exchanger: A Cfd Modeling

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**Abstract** - Utilization of the heat exchanger shell and tube is now increasingly widespread, especially in industry and technology. Designing a good heat exchanger is absolutely necessary in order to provide maximum heat transfer effectiveness, such as baffle arrangement distance. The purpose of this study is to improve the shell and tube heat exchangers trainer's effectiveness in Heat Transfer Laboratory Department of Mechanical Engineering Unesa, in supporting the practical activities undertaken by students. The study is a simulation of the performance of the effect on the effectiveness of baffles within heat exchanger shell and tube type with a disc and doughnut baffles so it is expected to obtain optimum effectiveness. Data collecting was conducted by performing numerical simulations based on Computational Fluid Dynamics (CFD). The results revealed that heat exchanger effectiveness was affected by the baffle spacing, which the highest value of Nusselt Number obtained at a baffle spacing of 30 mm which is 25.82, it means generating value maximum heat exchanger effectiveness. Then the distance between the baffles also affect the pressure drop, which the maximum value of pressure drop is 3.22 Pa at baffle spacing of 60 mm. While the value of the lowest pressure drop obtained in the heat exchanger with a baffle spacing of 30 mm, it means that distance allows fluid flow without major obstacles.

**Keywords:** shell and tube heat exchangers, disc and doughnut baffles, effectiveness, CFD, heat transfer

## 1. Introduction

Heat transfer process is a form of energy transformation and has a very important role in various fields, especially in industry and technology, such as machinery industry, power plants, aircraft, automotive industry, drying and cooling etc. In its process, it always involves a heat transfer process. The heat transfer process requires several requirements such as specific temperature requirements for the system, so that the system will work as planned. In order to regulate the heat transfer occurs, a tool named heat exchanger is needed. Application of heat exchangers are frequently encountered among others, in the process of heating or cooling a fluid flow involving evaporation or condensation of single or multicomponent fluid flow. Another purpose of the application of heat exchangers, such as used in process of sterilization, pasteurization, fractionation, distillation, concentration, crystallization, or control of a fluid process. Therefore, the heat exchanger is a tool which is commonly used in food and beverage processing industry.

The rapid development the growing need for energy, needs a lot of research and development in heat exchanger field. Designing a good heat exchanger is absolutely necessary in order to provide a high heat transfer effectivity with smaller dimensions. With a good performance, it is expected to get maximum results to support the process towards a fabrication operation.

According Cengel (2003), the process of heat transfer in the heat exchanger is largely dominated by convection and conduction from hot to cold fluid, which are not in direct contact because in this case they are separated by a wall. Heat transfer in convection way is strongly influenced by the geometry of the heat exchanger and dimensionless numbers, Reynolds number, Nusselt number and Prandtl numbers. The third major dimensionless number, also depends on the flow rate and fluid properties include the density, absolute viscosity, specific heat and thermal conductivity.

In the daily application, there are a lot of different kinds or types of heat exchangers. One of them is shell and tube type, which is often found and used for comparison experiment with other type of heat exchanger. It is widely used because it has advantages due to its strong construction, and easy maintenance. The main component of the shell and tube heat exchanger is a tube, baffles, shell, front head, rear head and nozzle.

In the shell and tube type heat exchanger, there are some things that need to be considered to obtain the effectiveness of heat transfer, such as types of fluid, flow rate, temperature, rate of heat transfer, pressure drop, the dimensions of the

shell and the tube (pipe), baffle spacing, baffle cut, pitch range, the composition of the tubes, and the type of material. In shell and tube heat exchanger, one fluid flowing through shell and others flow through small pipes (tubes).

Generally, the fluid flow in the shell and tube heat exchanger could be in one direction (parallel flow) or opposite direction (counter flow). To create a fluid flow in the shell and tube heat exchanger into a cross flow, a baffle or baffles are usually added. It is based on research by Ekadewi Anggraini Handoyo (2004), which study the effect of the use of baffles on the shell and tube heat exchangers. Cross flow which is obtained by adding baffles will make extensive contact with the fluid inside the shell wall of the larger tube, so that the heat transfer between the two fluids increases. In addition to convert the flow to be a cross flow, the baffle is also used to keep the tube not curved (functioning as a buffer) and also reduces the possibility of vibration caused by the fluid.

Theoretically, the baffles installed with small distance will increase the heat transfer that occurs between the two fluids which means an increased effectiveness, but the resistance occurs in the flow through the baffle gap is being higher so that the pressure drop becomes high. But if the baffles installed in long distance, pressure drop that occurs will be small, but the heat transfer occurs isn't good and there will be vibration. It shows that the distance between the baffles should not be too close or distant. Therefore, the analysis and research to determine the effect on the effectiveness of baffles within heat exchanger shell and tube type needs to be done. This study did the test by varying the distance of disc and doughnut type baffles on the shell and tube type heat exchanger, which has a shell and some tubes.

## **2. Research Methods**

### **2.1. Types of Research**

The method was conducted in a numerical simulation based on computational methods. The application of numerical simulation-based computing with the help of CFD was applied due to its ability to obtain the parameters of the test without doing the actual testing. Numerical simulations have helped to determine the temperature distribution patterns that occur in the shell and tube heat exchanger with the effect on disk and doughnut baffle spacing. The value of the parameter obtained is then presented in the form of the contour.

## 2.2 Research Variables

The variables in this study consist of three kinds: the independent variable, the dependent variable and the control variable:

1. The independent variable is variable that affects or is the cause of the change or the emergence of the dependent variable. In this study, independent variable used is baffle spacing variations of 3 cm, 6 cm and 9 cm. In determination of independent variables (distance baffle), it is based on TEMA (Tubular Exchanger Manufacturers Association) standards and Mukherjee (1998), which stated that the minimum baffle spacing is 0.2 of the diameter of the shell while the maximum distance is 1x of the inner diameter of the shell. Meanwhile, according to Kakac Sadic in book of "Unmatched Thermal Rating and Design", the baffle spacing recommended is starting from 0.4 to 0.6 of the diameter of the shell. According Thulukkanam in books of "Heat Exchanger Design Handbook" recommends for the type of disc and doughnut baffle, start at 20% - 45% of the diameter of the shell. It is due to the distance baffle passes the minimum distance set,
2. The dependent variable is any variable that is affected or which become due for their independent variables. In this study, the dependent variable is the effectiveness of the heat exchanger shell and tube type with a disc and doughnut baffles.
3. Control variables: are variables controlled or held constant so that the effect of the independent variable towards the dependent variable is not influenced by external factors which is not examined. Control variables in this study are:
  - a. Specified temperatures on hot and cold fluid temperature in ( $T_{h, in}$ ) at 80° C and ( $T_{c, in}$ ) of 30° C.
  - b. The flow rate of hot fluid is set at 4 lpm, and flow rate of cold fluid is set at 6 lpm.

Shell and tube heat exchanger that uses the disk and doughnut baffles is displayed in Figure 1, then Table 1 describe its specification.

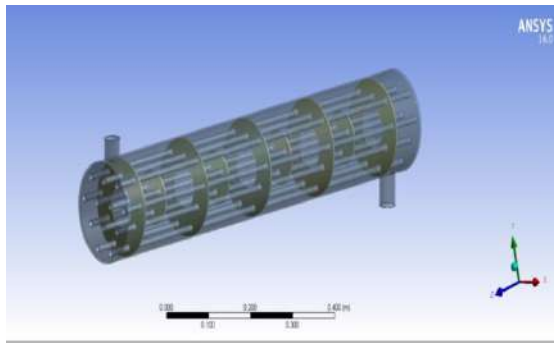


Figure 1. Disc and doughnut baffles

**Table 1.** Specifications of Shell and Tube Heat Exchanger

<b>Fluid</b>	<b>Flow</b>	<b>Counter Flow</b>
	Heat transfer is not the type of direct contact	One phase
	The working fluid in the tube	Water
	The working fluid in the shell side	Water
<b>Shell</b>	<b>Classification Construction</b>	<b>One Pass Shell</b>
	The outer diameter of the shell	170 mm
	The diameter of the shell	164 mm
	The length of the shell	960 mm
	Material shell	stainless steel
	The number of passes on the shell side	1 passes
<b>Tube</b>	<b>Classification Construction</b>	<b>One Pass Shell</b>
	Total tube	12
	The outer diameter of the tube	0.5 in
	The thickness of the tube	0.8 mm
	The length of tube	966 mm

	Material tube	Copper	
	Number of passes tube	1 passes	
	The composition of the tube	60 (Triangular) <sup>o</sup> staggered	
	Tube pitch	45 mm	
	<b>Disc and Doughnut Baffles</b>		
<b>Baffle</b>		Baffle cut	20%
	Disc and doughnut baffles	Distance baffle	60 mm
		Surface area	110,000 mm <sup>2</sup>

### 2.3 Data Collection Technique

There are two types of data collection techniques in this study, which are:

1. Instruments of research which using CFD software named Ansys 16.0.
2. Data collection which consists of three parts:
  - a. Pre-Processing: the first step in starting the simulation process which is to create a model of the geometry of shell and tube heat exchanger through Ansys 16.0 software. The model is in the form of a shell and tube heat exchanger with disc and doughnut baffles.
  - b. Processing/ solving: at this stage, process which has been done before will be calculated by iteration. At this stage, it is expected to achieve convergent results because when it does not achieve convergence, the stages should be rerun to manufacture and also fix the mesh. However, if the results obtained are convergent, then it can proceed to the next stage.
  - c. Post - processing: at the post – processing, results of the calculation (iteration) converted to the qualitative or quantitative data. Qualitative data displayed such as Temperature Contour, Streamline Contour, Velocity Contour, Pressure Contour, Renderin Volume.

### 2.4 Data Analysis Technique

Technique of data analysis used in this study is explained as follows:

1. The calculation of the rate of heat transfer in a shell and tube heat exchangers.



Data analysis techniques used in this study to determine the temperature distribution in the shell and tube heat exchanger with different baffle spacing variation is the 3D analysis presented in the form of the contour of the temperature distribution. The latter stages to determine the optimum baffle spacing, then the calculation of the performance stage of shell and tube heat exchangers. Performance calculation will be performed on each variation baffle distance predetermined by using effectiveness-NTU method, as already discussed in the previous chapter are as follows:

a. The rate of heat capacity (C)

$$C_c = \dot{m}_h \times Cp_h$$

$$C_h = \dot{m}_c \times Cp_c$$

Note:

$$C_c / = \text{Rate of heat capacity of hot or cold fluid (W / } ^\circ\text{C)}$$

$$\dot{m}_h / = \text{Fluid mass flow rate of cold or heat (kg / s)}$$

$$Cp_h / = \text{Specific heat of hot or cold fluid (J / Kg } ^\circ\text{C)}$$

Description: The smallest of the price or  $C_{min}C_cC_h$

$$C_{min} \Rightarrow \text{If } C_h < C_c \text{ then } C_h = C_{min}$$

$$C_{min} \Rightarrow \text{If } C_c < C_h \text{ then } C_c = C_{min}$$

b. Maximum heat transfer (qmax)

$$q_{max} = C_{min} \times (T_{h,in} - T_{c,in})$$

$$q_{in} = q_{out}$$

$$q_h = q_c$$

$$= \dot{m}_h \times C_h \times (T_{h,in} - T_{h,out})$$

$$= \dot{m}_c \times C_c \times (T_{c,out} - T_{c,in})$$

Note:

$$q = \text{The rate of heat transfer (watt)}$$

$\dot{m}_h$  = Mass flow rate (kg / s or LBM / h)

$h$  = Enthalpy heat on the fluid inflow side (J / kg.)°C

Subscript:

h ; c = Describes as a hot fluid and cold fluid

i ; o = Describes inflows and outflows

c. Effectiveness ( $\epsilon$ )

$$\epsilon = \frac{q_{actual}}{q_{max}} \times 100\%$$

Note:

$q_{actual}$  = Actual heat transfer rate (Watt)

$q_{max}$  = Maximum heat transfer rate (Watt)

Results of some performance parameters are then compared and whichever are considered optimal in accordance with the conditions of the application.

### 3. Results And Discussion

#### 3.1 CFD Simulation Model Development

The first step in starting the simulation process is to create a model of the geometry of shell and tube heat exchanger through Ansys 16.0 software. The model is in the form of a shell and tube heat exchanger with two different types of baffles that disc and doughnut baffles and helical baffle. The results of the model geometry of shell and tube heat exchangers are displayed in Figure 2 and 3.

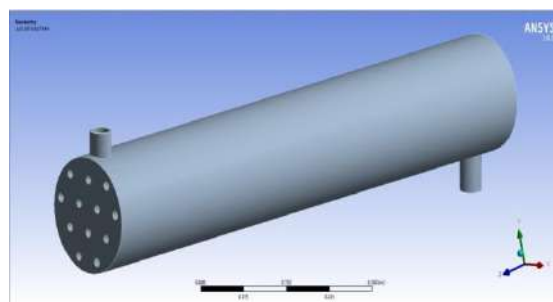


Figure 2. Shell and tube heat exchangers

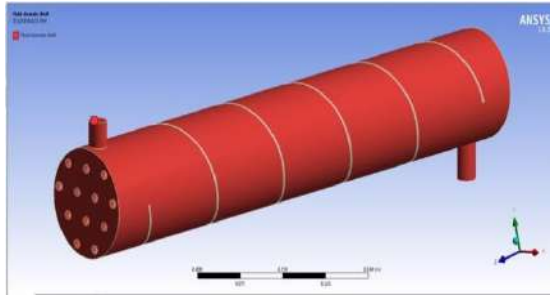


Figure 3. Fluid shell domain

Furthermore, the results of the model meshing process is carried out so as to do the process of solving. The results meshing is done in Ansys 16.0 are displayed in Figure 4 and 5.

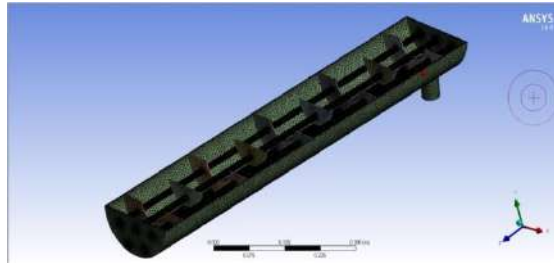


Figure 4. Results meshing shell and tube heat exchangers in Ansys 16.0

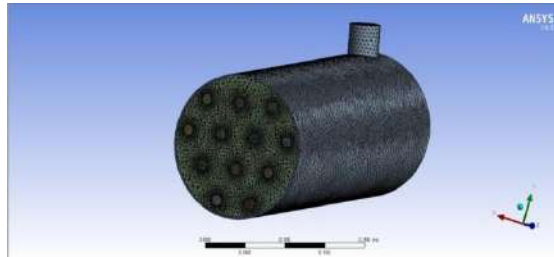


Figure 5. Results pieces meshing shell and tube heat exchangers in Ansys 16.0

Based on numerical study conducted by Elsayed et al. (2013) on numerical studies to analyze the characteristics of heat transfer and pressure drop used mesh hex / wedge cooper elements to build a mesh volume, boundary conditions specified in the inlet are velocity inlet and the outlet is defined as a pressure outlet, so by looking at the cases analyzed hence in this study were selected mesh hex / wedge around the tube and mesh tet / hybrid to the inlet and

outlet areas as displayed in Figure 6. Dhande et al. (2013) also use a hex mesh / wedge elements cooper to analyze pressure that occurs in hydrodynamic journal bearing 3 lobes. Hex /wedge means that the generated mesh is hexahedral mesh and some of them are wedge mesh.

Mesh and solver parameters, as displayed on Table 7, depend on the grid independence test which can be found on the lowest deviation value. Deviation value is the value difference of the temperature measurement results with the outflowing water temperature value of simulation results. In addition, the quality of the grid is one of several important things that affect the precision and efficiency in numerical calculation (He et al, 2015).

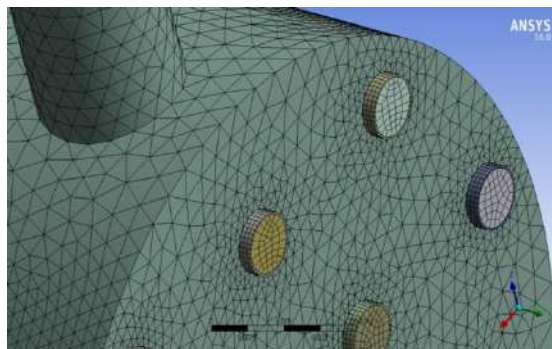


Figure 6. Tetrahedral mesh and hexahedral mesh

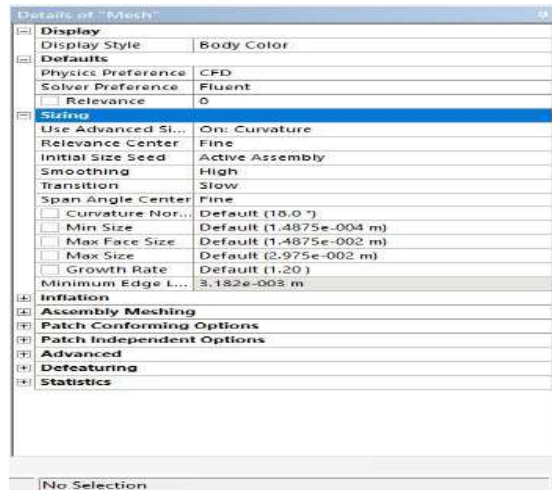


Figure 7. Mesh Parameter

After performing the meshing stage, the next step is to determine the boundary conditions. Inlet mass flow boundary conditions are used to define the flow rate and other scalar quantity on the inlet side stream and used only for incompressible flow (Tuakia, 2008). The boundary conditions are explained in Table 2.

Table 2. Boundary Conditions of Shell and Tube Heat Exchangers

No	Specification	Boundary conditions
1	Inlet	Mass Flow Inlet
2	Shell	Adiabatic Wall
3	Tube	Convection Wall
4	Baffle	Adiabatic Wall
5	Outlet	Outflow

Determination solver is intended for testing conditions approaching actual conditions such as selecting the type of 2D or 3D solver, determine the model of turbulence (viscous model). Then determine the boundary conditions (boundary condition) of the shell and tube heat exchangers are made.

### 3.2 CFD Simulation Results

The following is the results of a simulation of the variation within the baffles in the shell and tube heat exchanger using the type of disc and doughnut baffles, obtained results form the contour of temperature and pressure. The simulation shows that variations in distance between the baffles (3 cm, 6 cm and 9 cm) appeared to give a different effect on the effectiveness and pressure drop along the fluid flow in the heat exchanger. It will be discussed more deeply on the following figure and its description.

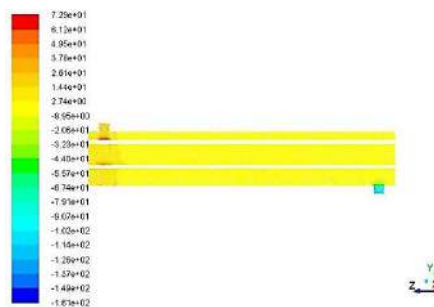


Figure 8. Static pressure of 30 mm

In Figure 8, the pressure occurs on the side of the shell and tube from the simulation results are  $1.44 \times 10^1$  and on the outlet side is  $-6.74 \times 10^1$  with pressure distribution decreasing from a inlet to the outlet. Constant pressure distribution along the shell and tube with a pressure of about 2.74.

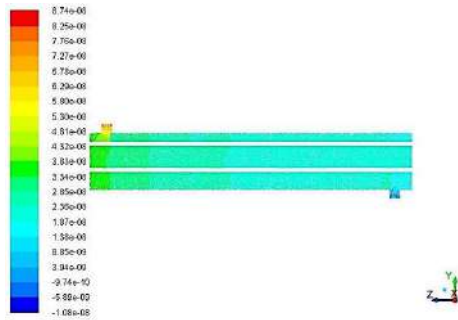


Figure 9. Static pressure of 60 mm

In Figure 9, pressure distribution is started from  $8.25 \times 10^8$  on the inlet side and the outlet side around  $3.94 \times 10^9$  at HE of 60 mm. The distribution of the whole shell and tube occurred on pressure of approximately  $4.32 \times 10^8$  to  $1.87 \times 10^8$ .

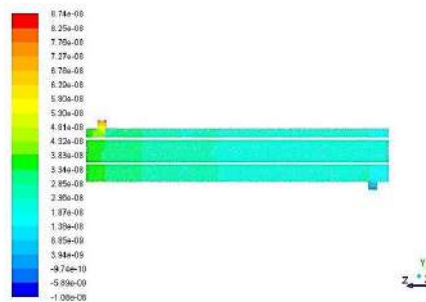


Figure 10. Static pressure of 90 mm

In Figure 10, static pressure of 90 mm on the inlet of heat exchanger is approximately  $7.76 \times 10^8$  and hand out approximately  $3.94 \times 10^9$  with the pressure distribution along the heat exchanger approximately  $3.83 \times 10^8$ .

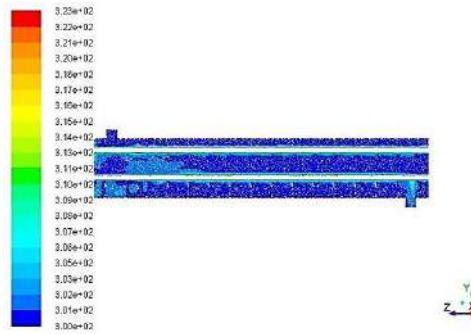


Figure 11. Static temperature of 30 mm

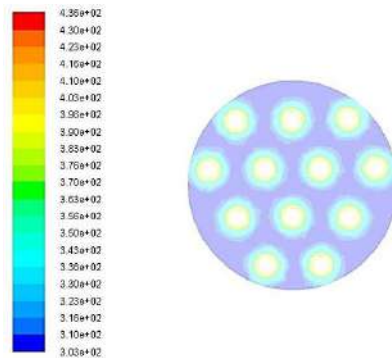


Figure 12. Static temperatures of 30 mm at z = 0:20

From Figure 11 and 12, it can be seen how the temperature distribution of the fluid flow are visualized in two dimensions on a heat exchanger shell and tube type with a baffle spacing of 30 mm. There are three gradations of color in the tube side is pink, yellow, and red. And two shades on the shell side are light blue, and blue. It shows there is a decrease in temperature on the tube side and the rise in temperature on the shell side.

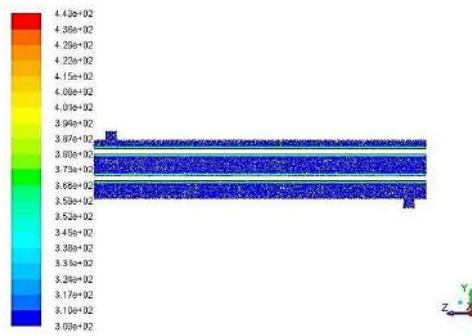


Figure 13. Static temperature 60 mm

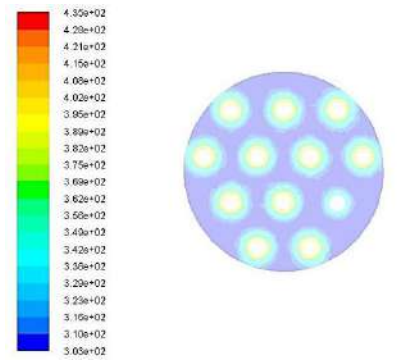


Figure 14. Static temperatures of 60 mm at z = 0:20

From the Figure 13 and 14, it can be seen how the temperature distribution of the fluid flow are visualized in two dimensions on a heat exchanger shell and tube type with a baffle spacing of 60 mm. There are three gradations of color in the tube side: green, yellow, and red. And there are gradations of color in this case shows that there is a decrease in temperature on the tube side and a temperature change on the shell side.



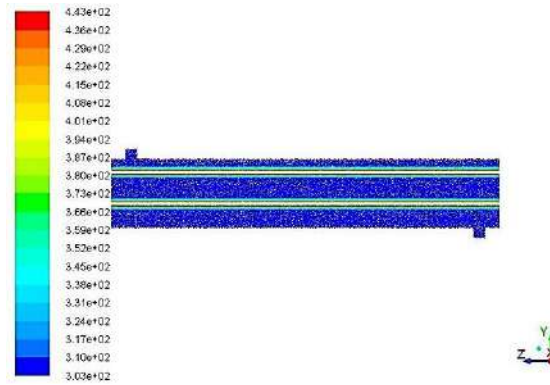


Figure 15. Static temperature 90 mm

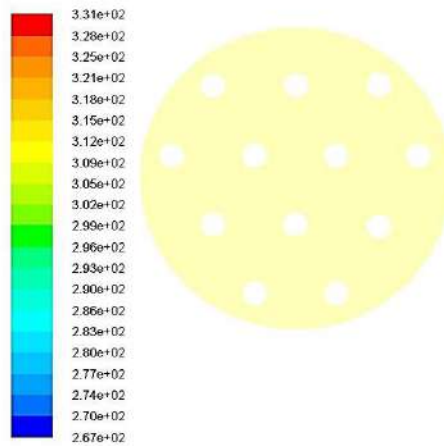


Figure 16. Static temperature 90 mm at  $z = 0:20$

From the Figure 15 and 16, it can be seen how the temperature distribution of the fluid flow are visualized in two dimensions on a heat exchanger shell and tube type with a baffle spacing of 90 mm. There are four shades on the side of the tube is light blue, green, yellow, and red. It has no shade, so it shows that there is a decrease in temperature on the tube side and a temperature change on the shell side.

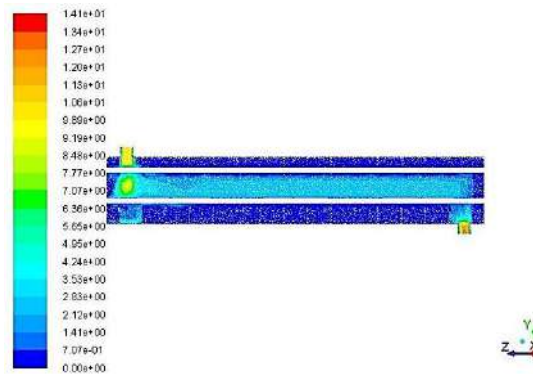


Figure 17. Velocity magnitude 30 mm

In the velocity magnitude of 30 mm, as displayed in Figure 17, velocity on the inlet side shell and tube results of the simulation with the type of disc and doughnut baffles, shows that the distribution of velocity on in shell and out of shell and tube there are differences in speed and can be seen there are four shades. It shows that there is a decrease in speed in and out of shell and tube shell and tube.

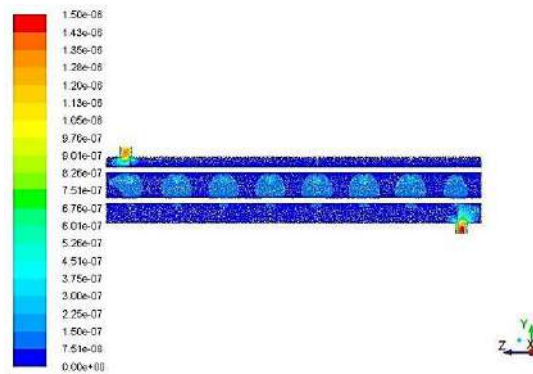


Figure 18. Velocity magnitude 60 mm

In the velocity magnitude of 60 mm, as displayed in Figure 18, velocity on the inlet side shell and tube which is the results of the simulation with the type of disc and doughnut baffles are shown in the picture 18. It shows that the distribution of velocity on in shell and tube and out of shell and tube there are differences in speed and can be seen there are two shades. This shows that there is a decrease in speed in and out of shell and tube shell and tube.

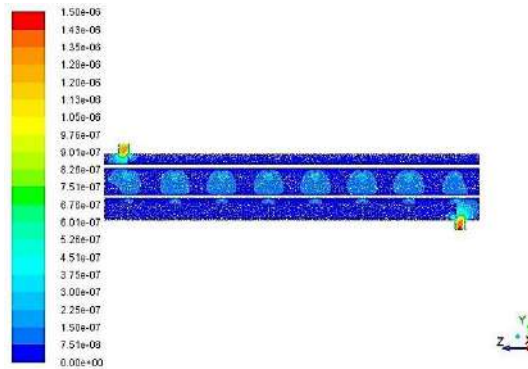


Figure 19. Velocity magnitude 90 mm

In the velocity magnitude of 90 mm, as displayed in Figure 9, velocity on the inlet side shell and tube results of the simulation with the type of disc and doughnut baffles are shown in the picture 19 shows that the distribution of velocity on in shell and tube and out of shell and tube there are differences in speed and can be seen there are two shades. This shows that there is a decrease in speed in and out of shell and tube shell and tube.

### 3.3 Numerical Validation

After CFD simulations, numerical validation by meshing the size variations was performed afterwards.

Table 3. Numerical Validation

Baffle Spacing	Meshing	Cells	Nu
30	A	8786258	12:57
	B	1028802	20.76
	C	1965142	25.82
	D	2657568	26.51
60	A	833 468	11:56
	B	1026549	18:57
	C	1942199	12:20
	D	2531640	13:00

90	A	1234866	11:56
	B	1924862	18:57
	C	2884228	20:07
	D	3038882	21:08

Table 3 shows the four types of meshing ranging from A to D, which represents the sequence number of meshing. Based on the table Nu constant values on average are shown in meshing of C and D. It can be assumed that the grid independence telah reached. Processing to process the data used in each variation is meshing of C.

### 3.4 Graphs Simulation Results CFD

#### 1. Outlet Temperature

Table 4. Outlet Temperature

Baffle Spacing (mm)	Temperature Out(K)
30	344.47562
60	303.00003
90	303.00074

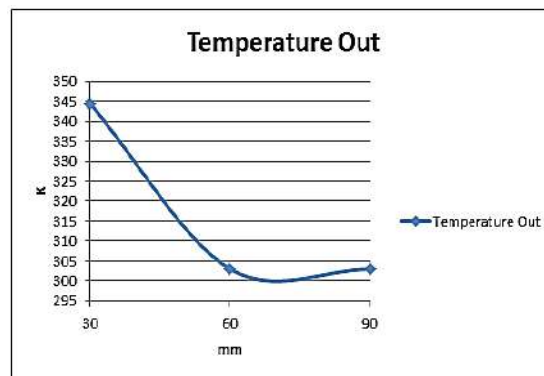


Figure 20. Graph of temperature outlet

Outlet temperature graph in heat exchangers with variations of the baffles as displayed in Table 4, can be seen in Figure 20. Based on the above chart, the highest temperature value obtained on the variation of the baffles 30 mm and the

60 mm variation indicates the smallest value Temperature out. While on variations 60 and 90 grades  $T_{out}$  did not differ significantly. This result is in line with the research conducted by Gowda (2018), which stated that the number of baffle has an effect towards heat transfer performance.

## 2. Nusselt Number Average

Table 5. Nusselt Number Average

Baffle Spacing (mm)	Nusselt Number Average
30	25.821882
60	12.198
90	17.924983

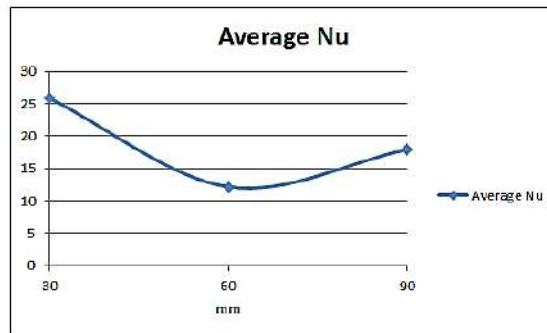


Figure 21. Graph of Nusselt Number Average

Graphs of Nusselt Number Average in heat exchangers with a variation of the baffles as displayed in Table 5, can be seen in Figure 21. In this graph, the highest value obtained on the variation of the baffles 30 mm and the 60 mm variation indicates the smallest value of Nu. Trends graph at the outlet temperature and Nusselt number shows similarities.

### 3. Pressure Drop

Table 6. Pressure Drop

Baffle Spacing (mm)	Pressure Drop (Pa)
30	1.93
60	3.22
90	2.34

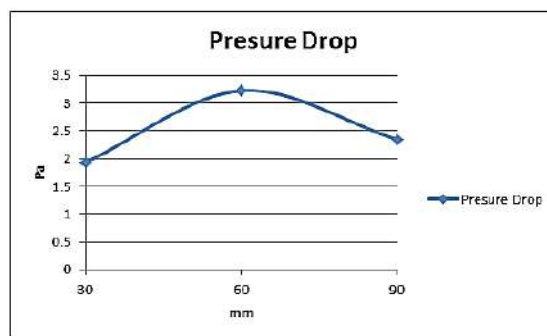


Figure 22. Graph of pressure drop

Graph of pressure drop in heat exchangers with a variation of the baffles as displayed in Table 6, can be seen in Figure 22. The highest value obtained on the variation of the baffles 60 mm and the 30 mm variation indicates the smallest value of Pressure Drop. It is due to the baffle distance has influence towards fluid flow. Less baffle distance leads to higher Reynold number. In addition, the increase of Reynold number is proportional to the increase of Pressure Drop. However, when the baffle distance is too small, it leads to small Reynold number because the fluid experience a lot of turbulences with the tube wall.

### 4. Conclusion

Based on the results obtained from this study, it can be concluded that:

1. Heat exchanger effectiveness is affected by the distance of the baffle. It can be identified from the highest value of Nusselt Number obtained, which is 25.82

with baffle spacing of 30 mm, this means generating value maximum heat exchanger effectiveness.

2. The distance between the baffles also affect the pressure drop, which is the maximum value of Pressure Drop 3.22 Pa identified at baffle spacing of 60 mm. While the value of the lowest pressure drop obtained in the heat exchanger with a baffle spacing of 30 mm, this means that at that distance allows Fluida flow without major obstacles.

## 5. Suggestion

Based on the results obtained in this study, it is very important to consider to redesign the trainer using the optimal parameters for the further enhanced trainer. For the next research, it is recommended to perform experiment which do comparison of disc and doughnut baffle with another type of baffle. Another suggestion for the practical application, it can be a guide to properly choose the number of doughnut and disc.

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## Chapter 21

### **Coservation Management of Culture in East Jawa: A Case Study of Tradition Dance**

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**Abstract** - This article aims to describe the management of dance studios in East Java in preserving three cultural areas, namely culture: Arek our Malangan, Mataram and Madura The capabilities possessed by the East Java dance studio are realized through management practices, creative work processes, and inheritance of noble values through education. Sanggar dance which represents three cultural regions of East Java, including Padepokan Mangun Darmo (Arek culture), Tarara Dance Studio (Madura culture), and Sanggar Singo and Aglar Nuswantoro (Mataram culture). The three dance studios show their existence and consistency, so that the culture that is grown continues to be a life guide for the people. This article is based on qualitative research. Data were obtained from interviews from Spardly, direct observations in the field, library studies, documents, photos and videos. Data analysis follows Miles and Huberman and with three streams, namely, reduction, data presentation and conclusion. The results of the study indicate that adherence to the cultural ways of thinking adopted by the community is able to make the management of dance studios effective in strengthening their cultural resilience. The conclusions of each artist have a preservation management model. The implication is that if conservation is carried out with good management, the identity and resilience of a nation will be strong. Conclusions artists and governments simultaneously need to do conservation focusing on the growing community.

**Keywords:** arek culture, mataraman culture, Madura culture, malangan culture, art studio, preservation

#### **1. Introduction**

Many countries in the world have a wealth of performing arts or arts as cultural heritage, thus distinguishing one country's culture from another. Performing arts or arts become a strength that has a great weight in culture, art is

loaded with content of cultural values, and even becomes a prominent form and expression of cultural values. Art is one of the dominant platforms for articulating intangible culture. The role of art is an important part of culture, as an expression and articulation of creations, initiatives and works. Performing arts or arts can transform themselves as shared property and shared pride with a community (local or national), then arts can play a role in increasing cultural resilience, becoming a national identity, as a tourism potential that provides input for the country's foreign exchange. Therefore, performance art (art) is important to be preserved. Performing arts (dance) during the independence movement also played a role in presenting Indonesia's identity in world cultural missions (Cohen, 2007). Therefore, the artists must make approaches to build performing arts by inviting the young generation to construct culture and art as a whole in accordance with the current era.

Performing arts in Indonesia continue to develop and new genres emerge based on traditional or non-traditional performing arts. According to Clammer (2014) in many ways we must have something that continues to be developed if it will not become extinct, then we will not have a future. That can be found in art, because art can be understood collectively and involve all of us. Sustainability of art is very important for the improvement, transformation, revitalization of discovering new stories in this world. The sustainability of art can be seen from various economic, ecological, industrial and cultural aspects.

Indonesian young generation there is a tendency to leave the performing arts or traditional arts. The condition of traditional arts, for example ludruk, kethoprak, wayang orang, are now almost extinct, this kind of traditional art is rarely found in East Java in particular and Indonesia in general. It is feared that someday there will be a generation that does not know where the tribes of the people are, as a result they become a nation that does not respect its country, does not know its cultural roots, becomes a foreign nation with its culture.

According to Tavkhelidze (2016) said .....

as happened in Gergonia many art projects, art shows do not attract much public interest. This has many causes: bad economic situation, people addicted to the internet, competitive environment, etc. In this case, the development of art management is very important. Nowadays, art managers must complete difficult missions; they must unite the arts and the audience. Effective managers need to have as much information

about the external environment as possible. In the modern world, gathering information is easy, managers are not fully aware of how to use it properly.

This was also conveyed by Kim (2015). Like the behavior of people in Australia who have had difficulty attending performances until now there are projects that help the performing arts sector especially the theater to encourage people to attend theater performances by providing vehicle facilities so that people change their behavior to attend the performances.

Culture as a whole encompasses the mindset or mindset of a society (about all its past, present and future life), which is widely expressed through a variety of arts. The development of art is the development of artistic values and appreciation of art to enhance the nation's dignity, while also improving the quality of art and appreciation of art. " As academics, the above propositions encourage the implementation of the following academic tasks: (1) It is necessary to identify certain dominant and viable arts in art galleries that have opportunities to be developed and enriched, and can attract the emergence of community appreciation; (2) Selected art is articulated in accordance with the demands of social development, so that it is easy to adapt and encourage general sensitivity to the values of artistic elegance; (3) Achieving the main goal of pushing the dynamics of art into creation and enlightenment for the completeness of everyday life, making it a kind of way of life and developing regional tourism.

National Development needs to start from efforts to develop art that can produce "cultural added value". Arts standards (local and national) need to be perpetuated, because they are rooted in the culture of the community. Through decomposition and reconstruction, recoreography, renovation, revitalization, refinementalization, accompanied by improvisation with various decorations, touches of values and new breath, will invite appreciation and foster possessive attitudes towards renewal and enrichment of artworks . This is where art becomes the cultural wealth and "social-cultural capital" of the community.<http://www.bappenas.go.id/Swasono>

East Java is a part of Indonesia that has a wealth of heterogeneous performing arts. There are 5 major cultural areas namely Banyuwangen culture, Mandalungan culture, Madura culture, Arek / Malangan culture, and Kulonan culture (Sutarto et al, 2008). These typical types of culture are the strengths of East Java. Banyuwangi, a regency area in East Java, is located at the eastern end of the island of Java. Cultural interactions between the Blambangan people and immigrants from Java and Madura formed the structure and pattern of

Banyuwangen culture, including: batik motif "Gajah Oling", the local language Osing Osing ancestral heritage of the successor to the kingdom of Blambangan (Majapahit). Musik Angklung Paglak, Janger traditional theater, Angklung Caruk. Mandalungan culture covers the regions of Jember, Probolinggo, Bondowoso and Pasuruan. The delicate Kulonan culture includes the Nganjuk, Tulungagung, Trenggalek, Ponorogo areas. Madura culture with a variety of arts that live in Sumenep, Pamekasan Sampang and Bangkalan. Likewise, Arek culture encompasses Malang with its wealth of masked arts, Surabaya, Sidoarjo, Gresik, Mojokerto, Jombang which gave birth to Remo dance. Here folk culture is very popular and gives a special identity to the cultural typology developed by the community, dance forms derived from popular character.

Art in East Java continues to grow and develop through studios. Art galleries, both in East Java or other provinces, were established by artists who care about the art life independently and independently. Art galleries are places where artists produce works of art, transmit works of art, perform and preserve works of art. The work of this art studio enlivened various events at the local, regional, national and international levels. This proves that the people of East Java are very strong in supporting the preservation of their regional arts through a studio.

Typical diversity and culture are characterized by different artistic products from one region to another as the identity of pluralism in East Java. Next is one of the Mangun Dharma studios that preserves Arek Malangan Culture in the form of puppet masks. From previous research, Sanggar Mangun Dharma is a place for learning art with traditional learning systems that are adapted to the customs and values of the surrounding community's trust. The field of art taught is the traditional theater of Wayang Topeng Malangan with the Panji story. Puppet Mask has become the main icon and material in the studio because this art is believed to be original from Malang which must be preserved. Besides Malangan Puppet Mask has an appeal for the global community and a special function for the people of Tulusbesar Village, Tumpang District (Jannah, 2019). Art activities at Sanggar Seni Mangun Dharma are learning and teaching art, making property supporting dance namely Mask which is characterized by Malangan culture to the people of Malang, for academic and practical purposes. In addition, arts organizations are also a main part of the study: how the system functions, the concept of order and criteria that are considered functional. The method applied in this study is descriptive method in the context of structural functionalism approach. The results of the study show that the Studio Mangun Dharma studio is a social fact that has the concept of empirical reality beyond one's imagination. In this case played by M. Soleh Adi Pramono the leader of the studio that creates various social

relationships between individuals on a regular basis at a certain time in the social system, so that it can be interpreted as a social structure that is permanent and stable Eksan (2006)

Further relevant research on the Malangan Puppet Mask in the 1959-1978 era was examined in the study of the influence of political policy and the contribution of its learning by Woro Windarti (2007) studying the puppet mask art of Malangan, like other traditional arts, developed in line with the existing socio-political conditions. Political influence which began to enter the realm of art, made the shadow puppet mask Malangan indirectly used as a medium for political propaganda. Therefore, this art is still developing well until the 1960s. The events of 30 September 1965 became a milestone in the death of Indonesian traditional arts, including the shadow puppet mask Malangan, which occurred until the era of 1966.

Furthermore, Madura culture developed at the Tarara Bangkalan Studio, led by Sudarsono. Bangkalan is one of the regencies on Madura Island which is located at the western end. The Regency has a variety of performance art products, both traditional and modern. Various performing arts products, including the Patenteng Mask, Sandhur, Cow Race, and Sarone Music, contain elements of drama, dance and music. Meanwhile, there are also ritual performances that also present dance, drama and music, for example Rokot Somor Brumbu, Mokka Blebe, and Bheten Pellets. These various performing arts products, in their lives, cannot be separated from the role of artists as the studio leaders. Sudarsono, as the leader of the studio, works in the Madura arts, even without art education. Sudarsono's struggle in mastering the art of self-taught gave birth to works that made proof of his artistic achievements, of course, could also bring Bangkalan art to the national domain (Erika, 2017). Sudarsono created the Angklung Mask Dance in 1999 inspired by an ancient tradition of fertility rituals in the Tamba Pocok Village, Madura. The response of the community at that time was positive, and since then until now people who have a wedding celebration are trying to present the Angklung Mask Dance. Sudarsono's Angklung Topeng dance is a composition or development from Nyireng Dance that has existed. Sudarsono worked on his dance moves with a new pattern, but still based on old patterns of motion, especially on his motion techniques. The shape of the mask is unique like a natural human face, the shape of the angklung instrument is not commonly found in the Madura region (Lestari, 2008).



Figure 1. Angklung musical instrument

<https://www.google.com/search?q=gambar+angklung+bangkalan>

Mataraman Culture, this region covers areas in the western part of East Java, namely Regencies: Ponorogo, Ngawi, Madiun, Pacitan, Magetan, Nganjuk, Kediri, Tulungagung, Blitar, Trenggalek, Tuban, Lamongan, and Bojonegoro. It was given the name Mataraman because it had a strong influence on the culture of the Mataram and Yogyakarta kingdoms with the use of Javanese language which was still smooth. Mataraman culture in this discussion is represented by the art of Reog Ponorogo. This art has been renamed worldwide, has been patented since 2001, Reog is now also an icon of East Java art. Reog performance is accompanied by jaran kepang (lumping horse) which is usually thick with a supernatural atmosphere. One of the ways to preserve Mataraman culture is the Regog group led by Bikam and the Sanggar Aglar Company Dance.



Figure 2. Reog Ponorogo Art (Mataraman Culture)



Figure 3 & 4. Horse Dance and Dance Warog Supporting Ponorogo Arts (Mataraman Culture)

The existence and solidity of this nation will be well preserved if the development and development of the arts strengthen self-awareness and identity as a graceful and civilized nation. This is in accordance with research Purnama (2015) The role of the studio in traditional arts as a container / shelter for a number of cultural arts, as a medium of education both education and training, as a medium of entertainment for the surrounding community and art enthusiasts, as a place to set strategies around the art occupied as a place of friendship (gathering and discussion) in order to strengthen brotherhood. Many studies reinforce the role of

the studio as a place to practice dance or art transformation in the next generation (Mindamiwati, 2014). In addition, there are creative processes in the form of cultivation, creation, revitalization and the like are also carried out by the community in the studio (Hawwa, 2015). According to Saerani and his research team (2014), Sanggar's non-formal education in Yogyakarta facilitates the teaching-learning process, cultural transformation, and is very effective as a cultural center. It was also mentioned that the non-formal education studio existed until now because there is a pattern of management. The role of the studio is very varied in the community, all of which are for the preservation of art. The preservation of art is in essence a tenacity to maintain the noble values of the traditions of the community as a form of cultural resilience owned by the community. This is what distinguishes from previous research, there are patterns of management for the Preservation of Performing Arts as Cultural Heritage. The activity of preserving the performing arts through the process of performing arts, the staging process, the educational process of the members of the studio is interesting, very unique and distinguishes one artist from another.

The management pattern of each studio in preserving the highly varied performing arts is interesting to study. The purpose of this study examines the preservation of three cultural areas namely Arek / Malangan culture, Mataram culture and Madura culture and management by dance studios in East Java. The results of this discovery are useful in introducing a very diverse Indonesian East Javanese performing arts, especially Arek / Malangan culture, Madura culture, Mataram culture about the form of clothing, dance, drama in the world community. Different cultures from one region to another will give rise to an attitude of mutual respect and respect for cultures between nations, thereby strengthening the harmony of a nation. The artists as managers of the studio have diverse management patterns in preserving traditional arts, this will be a reference for other studios in Indonesia or abroad As art academics will find strategies to preserve traditional arts in the form of revitalization, reconstruction, commodification, restructuring or cross-border development. other culture.

## **2. Research Methods**

This research uses a qualitative approach, qualitative research reveals a reality in society, researchers are considered capable of studying objects without influencing or influenced (Denzin and Yvonna Lincoln, 2009). Empirical facts related to the ways ethnic groups maintain traditional dance has been carried out by the community through the process of enculturation, socialization, reconstruction, revitalization, various community patterns related to the



preservation of traditional art values by building art studio institutions. The community that builds it is either as an artist, as an academic artist, as a funnel funder or as part of a society that cares about the preservation of the arts. The qualitative approach is suitable for research that aims to explain cultural phenomena, especially values, art concepts, creative processes, the context of art presentation, the lives of artists and audiences as well as the environment that supports art (Soewarlan, 2015, Rohidi, 2011).

The formal object of this research is the management of the preservation of the performing arts, while the material object is the dance studio in three areas of East Java, namely Arek culture, Malangan culture and Mataram culture. Data collection techniques, using observations, observations were carried out to obtain data about the activities of people in the studio and dance works produced as well as public interest on the existence of the studio. According to Rohidi (2011) in the observation of researchers will be able to reveal a systematic picture of the behavior of art education education (appreciation and creation), artistic tools (medium and technique) at the research site (studio, pavilion, community and so on). Through observation the researcher studies the behavior and important matters related to the research topic. Behavior contains expressive intentions which are rooted in deeper cultural values, beliefs and knowledge. The observation technique used is ordinary observation which means that the researcher is not involved in an emotional relationship with the subject of the study (Rohidi, 2011: 182).

The interview used is an ethnographic interview, which is a specific type of interview from a speaking event. According to Spardley there are 3 most important components in ethnographic interviews, namely the explicit purpose of the reason for the interview, then ethnography begins to open up the acquisition of cultural information, the second explanation is related to ethnographic interviews and the last to obtain cultural data (Rohidi, 2011: 210). Interviews were conducted with prominent figures, namely special informants who were influential, prominent and knew a great deal about the organization of the studio and the field being studied. Informants are chosen based on expertise.

Art analysis is done by searching for meaning: the existence, management of the establishment of studios, dance works, patterns, explanations and configurations of causal relations and the propositions that emerge. Three streams in art analysis are reduction, data presentation and conclusion drawing.

Analysis in art according to Coffey and Atkinson is imaginative, flexible, creative and reflective showing high proficiency and intellectual ability. Art analysis is done by searching for work, noting regularities, patterns,

explanations and configurations of causal relations and emerging propositions. The analytical approach used by Miles and Haberman especially in the arts is the understanding of interpretivism (in Rohidi, 2011: 222) human activity is seen as a text collection of symbols that express meaning. To interpret meaning, a deeper understanding is needed. Data reduction is done by selecting, sorting and simplifying, abstracting and transforming rough data in accordance with the research topic. Reduction is carried out continuously throughout the study. Presentation of data is done by making narratives, combining information and compiling it into an integrated and easily understood form. Drawing conclusions is essentially part of a complete configuration activities, this is done continuously is a cycle of analyst activity.

### **3. RESULTS AND DISCUSSION**

#### **3.1. Preservation of Arek / Malangan Culture, in Sanggar Mangun Dharma Malang**

##### **1. Arek / Malangan Cultural History**

The term "Arek" comes from a familiar nickname for children to adults. The word Arek is used to describe a brave person as a characteristic in the areas of Surabaya, Malang, Sidoarjo, Gresik, Lamongan. As a form of greeting, the word Arek is a cultural identity that departs from association or the presence of social interaction means high solidarity. Thus, the relationships that are formed from Arek culture can be traced from the origins of human existence or the formation of Arek society. The early formation of the Arek community can be traced in the period of the 4th century or earlier to the 9th century AD In the 20th century during the war of independence at this time, the Arek people reached the culmination of their revolutionary struggle.

In the 4th to 9th centuries AD, Arek and Malangan culture emerged with archipelagic cultural patterns influenced by Javanese Hinduism. On the religious and religious side of the 4-9 century AD, Arek culture is identical to Javanese Hindu culture, because the whole order of life refers to Javanese Hinduism. The beliefs of the Javanese Hindu era are still attached to some of its people, including the art community, especially the dance community. Thus, all management patterns and attitudes of the production of the performance carry elements of Javanese Hinduism (Abdillah, 2007: 12).

Arek / Malangan culture, both are in the relatively same Arek conception. Malangan culture was born from the complexity of the existence of historic major empires in the archipelago. Malangan culture has a more complex

historical narrative and folklore, starting from betting romance between siding with the people or the kingdom, forbidden love and power struggles. This has a very broad impact on the birth of arts with historical and aesthetic significance. Significant changes in Arek culture began in the 13th century AD. After the small islands were separated from each other, Arek Culture formed a multi-layered human character, on one side of the ancient hard layer due to its natural influence, on the other hand mystical and religious layers whose levels fluctuate according to beliefs held by the people, such as the entry of Islam and Christianity in the 14th century.

Arek culture both have a high level of solidarity. Solidarity in the Arek and Malangan cultural communities is pragmatic and profane rather than sacred and binding. The Arek culture also Malangan, which is democratic, is open to accepting the opinions of others wisely and egalitarian no longer effectively forming its cultural consensus. This is caused by the increasingly integrated culture with each other, the closer distance between cultures, makes people look at culture or culture as something trivial, simple, unimportant, and old-fashioned.

## 2. Preservation of Arek / Malangan Culture and its Management in Sanggar Mangun Darma

The establishment of an arts organization in the community is the will of the community to fulfill their artistic and cultural needs. Indonesian society is an agrarian society, this is what drives the existence of ceremonies in the tribal environment in Indonesia and the performing arts theater, dance, music and other spectacle. According to Munardi (in Handayani, 2016: 188) there are several performing arts management in Indonesia, namely community management, incidental management, commercial, formal schooling and television. Related to the management of Mangun Dharma Studio in generation 1 to 3 the management is related to the function of the puppet mask art. Based on the function of the puppet mask at that time was performed in the framework of the ceremony, which is a ceremony honoring ancestors. Then respect, decline, and protection become the basis of aesthetics that are packaged in religious elements. Performances that are sacred and are done in earnest with all the ceremonial. The show is packaged not according to the will of the audience, but is shown for a reason, an intention related to the belief system. Managing such shows is needed togetherness, mutual cooperation in organizing performances, based solely on the spirit of the community as a cultural supporter.

Sholeh Adi Pramono is the leader of the Mangun Dharma studio. He graduated from Yogyakarta's Indonesian Art Institute. The activity at the dance studio is to teach dance and revitalize the traditional puppet theater in Malangan style. According to Berg (in Supriyanto 1997: 5) "Mask Puppet Show with Panji plays is estimated to have existed since the time of Singasari in 1268 - 1298 AD and the heyday of the Majapahit kingdom". In addition, this dance studio also preserves the handicraft of Malangan, karawitan, Mocopat (tembang), carving masks and shadow puppets. The material worked on is a legacy of ancestors. For dance, Sholeh Adi Pramono developed dance creations that are new but less productive.

Sanggar Mangun Dharma in its development in the 1990s became an institution of cultural resource studies typical of Malangan under the name Mangun Darma Art Center. The form of padepokan activities is practicing making masks, offering mask performances, practicing mask dances and performing. This studio is a place of study for students both at home and abroad who will learn about Puppet Mask and Malangan art. It is also a place to practice the Mask Puppet players who are members of the studio.



Figure 5. Mangun Dharma dance studio

The culture produced by the Mangun Dharma dance studio is a manifestation of the values and guidelines for the cultural life that develops in the community. The flagship production of the Padepokan Manungun Darma dance studio is the Mask connected with puppetry and dance. Padepokan Mangun Darma Malang also produces masks. This studio performs rituals to build personal power

and pre-production a performance, in the form of bathing in a particular river or fasting and praying. It is believed that the ritual performed can give strength in the production process.

The cultural characteristics of Arek Malang in this studio lie in the form of performances, narrative Panji stories and Ramayana and Mahabarata stories. Arek's cultural character is shown in egalitarian and democratic attitudes when producing puppet mask performances. All members are considered important so that the role in the mask puppet is carried out in earnest. All members of the studio can give their thoughts to advance the studio. Spectators and players on the stage can interact with each other, to show a high kinship. Relations between all members of the dance studio are very close and intimate. In the narrative of the show, it always shows the excellence of the little people who seek justice. On the Malang Mask side, as said by Kamal (2010: 54) that:

Initially, masks were used as a means of ritual in religion. Hinduism is a religion that developed rapidly in the kingdom of Majapahit, automatically mask also developed as a form of dance. As Islam entered Indonesia with the collapse of the Majapahit kingdom, during the days of Sunan Bonang and Sunan Kalijaga, mask dance experienced rapid development. The mask dance takes the characterization of the Mahabarata story, the Ramayana as well as the Panji and Menak stories, while the sunan-sunan are not only in East Java, but are also scattered in the regions of Central and West Java. After the sunan left, the mask dance disappeared. Suryo Atmojo who became Abdi Dalem Kraton Majapahit fled to Malang while bringing his mask and dancing skills, and served the first regent in Malang regency as Mantri Agung / Assistant Regent. The regent was interested, who in the end set the mask dance as a typical Malang dance

Malangan Mask has become an important part of Arek Malang culture, because it is able to present the identity of its people, historically, philosophically, religiously, anthropologically, and sociologically. This kind of Arek Malang cultural production is a buffer for cultural resilience as well as in cultural and social life. The Malangan culture is very different from the Balinese culture which is still focused on the initiation of religion and has not produced cross-cultural performing arts, so people see Balinese dance as if they see reliefs in temples (Hobart, 2007). Big changes in the post-information era especially with regard to

To support the studio, the studio leaders got it from the performance results. Staging is an arena for the presentation of works of art studios that contribute to the perpetrators and to the studio where the actors take shelter, from

preparation to staging production. In this position, the studio manager takes into account all the needs of staging production, ranging from the provision of clothing, the arrangement of dancers, consumption during training, transportation to the staging place and production services for actors and managers and their institutions. All financial consequences are borne by those who want a performance which is often referred to as a respondent (interview with the owner of the studio, Sholeh Adi Pramono, 11 September 2018).



Figure 6. Festival Panji Internasional (Dok. Padepokan Seni Mangun Dharma 2018)

According to Sholeh Adi Pramana, Sanggar Mangun Dharma consists of two words Mangun is meant to continue to build and Dharma means to practice, bequeath the art and its contents in the form of a learning process. Sholeh realized that if art was not taught and passed on, it would stop at that time. Art can live according to natural selection, the strong continue to live and the weak will die. Society is a force which always influences cultural life strongly. Because human nature helped shape the age, humans should always be active in advancing culture (Dewantara, 1967: 85).

The position of the Mangun Dharma studio for the community, especially the Tulusbesar Malang village is quite important, because the studio is one of the cultural assets and traditions of the community, every traditional activity such as cleansing the village always utilizes the energy and creations of the studio and attracts tourists to visit and get to know the Tulusbesar village. Thus the existence of this studio is very important.

Studio activities at this early phase became a means of gathering of art artists. Furthermore, the studio students are family members and relatives of the studio owner, as well as the community around the studio. This studio is a non-formal learning institution that is traditional in nature, in the learning process it only follows the prevailing tradition. The learning process is based on traditional values so that students can understand that tradition is an important part of art that cannot be separated and must be inherited. The purpose of learning in the Mangun Dharma studio is to enliven, preserve the original art of Malang. To make students active, love and have the soul of art through the Malangan Puppet Mask and other Malang arts.

The method used by Sholeh in teaching students is based on experience, traditional values in the studio and based on the character of the students, namely: Niteni, Nyonto, and Nglakoni (Paying, Exemplary and Applying). the arts that become learning material in the hermitage include: Jaranan, Macapat, Karawitan, Dance, Puppet Mask Malangan



Figure 7. Malangan Puppet Mask Performances Commemoration (Padepokan Seni Mangun Dharma 2017 Doc)

Specifically for the Malangan Wayang Puppet material, there are a number of sub special materials given because the Malangan Puppet Mask has differences with other materials. In the Puppet Mask material, the sub-material given is the introduction of the script and the plot, the introduction and deepening of the play, the introduction and memorization of gending, as well as understanding of sulukan and incantation. Thus Sanggar Mangun Darma

(Tumpang village, Malang district) led by Sholeh is an art studio that preserves Arek and Malangan culture. This studio preserves Wayang Mask as a relic that carries elements of Javanese Hinduism and is now melting with Islam. The inclusion of Islamic elements is found in mantras that some use Arabic pronunciation and glorify God Allah Subhanahuwata'ala.

### **3.2. Preservation of Madura Culture in the Tarara Bangkalan Madura Studio**

#### **1. Cultural History of Madura**

Madura is a small island located next to East Java, which has a lot of arts and culture. Madura tribe is one of the ethnic groups of Indonesia that has a fairly large population and is spread in other regions of Indonesia because of its overseas culture. Madurese culture is one of the most well-known in Indonesia, its customary clothes are patterned horizontal lines of red and white familiar familiar to most Indonesians, clurit weapons, trumpets called saronen, cow race (bull racing), fighting culture (Carok), and Rondhing dances, Gethak Mask, Sholawat Jidor, Kerapan Sapi.



Figure 8. Madura men's clothing





Figure 9. Cow Race (Cow Race Race)

Madura tribe inhabits 4 districts namely Bangkalan, Sampang, Pamekasan and Sumenep. Sumenep is a region that is believed to be the center of the kingdom of Madura in ancient times. Therefore the Madurese dialect which is used as the unifying language is the Sumenep dialect.

The Madura region gained greater Islamic influence than Javanese Hindu elements. Around 900-1500, the island was under the influence of the East Javanese Hindu kingdoms such as Kediri, Singhasari and Majapahit. Between 1500 and 1624, Madurese rulers were to some extent dependent on Islamic empires on the north coast of Java such as Demak, Gresik and Surabaya. In 1624, Madura was conquered by Mataram. In addition, his meeting with the Islamic Mataram kingdom, specifically the Sumenep district, had an impact on the strengthening of the cultural order that had elements of Islam and Mataram culture, such as in speech and spells for ritual and artistic activities. especially dance. The great power of Islamic elements shapes the movement and artistic image. In the Madurese cultural realm elements that are not Islamic cannot be expressed or produced in dance. Likewise in the management of arts that have strong ties to the Muslim usnur, such as in building interactions with community members or dance clubs. However, Madurese people still have a cultural character to build certain icons, such as the selection of harsh colors (black, red, yellow), also making cows as one of the activities that are called Karapan Sapi (cows that are contested to run). Hindu mystical and ritual elements still accompany various cultural procedures, certainly with a more dominant approach to the Islamic elements, and different from the Arek and Mataram cultures.

Tarara Studio is a studio that preserves and develops the Madura art form of the Bangkalan region. The leader of the studio named Sudarsono came from a family of artists, his father was a literary player of vocal. From his father's blood, Sudarsono became a music artist, dance artist and brought Bangkalan children to be educated in art. At present he is very well known by the Madurese and other regions because of his productive production of dance art that elevates the culture of Madura Bangkalan. Dance works that have been produced are Pasemoan Kerraben Sape, Kamantakah dance, Topeng Pententen and so on (Erika, 2017).

## 2. Preservation of Madura culture and its management at Sanggar Tarara Bangkalan Madura

As an art organization Tarara dance studio in Madura led by Sudarsono different management. This studio stands not from the heir of the studio. How to manage the Tarara studio is semi-professional. Music, visual, literary or performing arts performers have the status from amateur to professional. Amateurs as artists who are rarely paid, semi-professionals as artists who work part-time in artistic activities besides the main work, professionals are artists who work only from their art (Bouvier, 2002: 352). Sudarsono, as the leader of the studio, recruits groups of children who drop out of school, unemployed, to practice with him to be able to play music. From there the owner lives his singing singing with bands or dance and musical groups for weddings or pilgrimages.

From the honor of singing and saweran all the performance facilities are equipped: costumes, accessories and musical instruments. Until finally Tarara Studio had clothing and accessories that were rented to meet the needs of the Madurese community. In its development, the Studio could empower all Studio members to be independent, to finance the Studio members for their education.

According to the leader of the studio, artists must be able to seize the opportunities that exist in society. Wedding needs, for example, from the manten fashion, manten accompaniment dance and music, are all provided by the studio and welcomed by the people who want to show their identity as Madurese. The art created by Sudarsono has a sale value. Bangkalan Government when in need of art events, surely the studio that handles it. This is where the government provides building loan facilities to practice. Artists are demanded to show their existence that there are new awards. Many more community needs have become opportunities and Sudarsono has been captured as an artist so that Sudarsono continues to work. 36 dance dances have been created by children, and 28 dances for adults. These dances were created by Sudarsono and his trusted faith trainer. The dances of his work are used as material for students to learn from Bangkalan

society. In addition, Sudarsono also chooses students who are already skilled to help train, these trainers are deployed in schools so that the Tarara Studio is able to train 25 primary schools, 5 Middle school and high school.

Sudarsono has preserved Bangkalan Madura art through learning at the studio and at school. Besides that, Sudarsono also preserved Madurese art through staging the people of Hajadan, actively participating in festival activities so that Madurese culture, especially Bangkalan, exists in the community.

According to Ruslana (1990: 13) studio is a place of activity in helping and supporting the success and mastery in the field of knowledge and skills. Art gallery is a place or place for people to do or learn an art that aims to always maintain its preservation in the community. In art studios, various dances, music, vocals, theater, carving, painting, and others can be studied (Amelia, 2013: 7).

Dance studio is a place to do a variety of dance activities together with its members, including teaching and learning activities in dance, creating art and exchanging ideas about everything related to art. The existence of dance studios is one of which is to maintain traditional dances and classical dances in addition to developing forms of modern dance, contemporary dance and dance creations. The entry of foreign culture can be dammed by instilling a love of national culture, one of which is by doing artistic activities (Sakti, 2005: 13). According to Sedyawati (1984: 56), dance studios are activities that originate from groupings. Dance studios are more likely as a preparation for professional activities, so there are staging targets in their activities. Dance studio is an art organization as a place or place for dance training activities for the community (Soedarsono, 1999: 20). Each system is maintained in the community as a result of the personal character of the artist or the popularity of educational institutions in the community.

### **3.3. Preservation of Mataram Culture at the Ponlarogo Aglar Company Dance Studio**

#### **1. Cultural History of Mataram**

Mataraman culture in East Java covers the areas of Jombang, Nganjuk, Madiun, Trenggalek, Tulungagung, Magetan. Culture in this region is romantic, mystical, and philosophical. The combination of Javanese, Hinduism and Islam mixed into one, the Mataraman region has experienced a series of long journeys. Mataraman culture continues to proceed, based on genealogical closely with the kraton of Surakarta and Yogyakarta. The pattern of life and language used is also close to the two cultures that are smooth and farming. It was given the name Mataraman because it was influenced by the Kingdom of Mataram, namely the

Surakarta Palace and Yogyakarta. The way of life is influenced by the combined Javanese philosophy of Hinduism, Buddhism, Indian philosophy and Islamic mysticism. The basis of Javanese society is mutual cooperation and family and divinity. Javanese philosophy (1) endeavors to open the road to reality, (2) think deeply about each phenomenon at issue until reaching a universal conclusion, (3) look for a clear relationship between cause and effect, (4) use a system and methods, (5) solving problems and looking for Objectives (Satoto, heru) Symbolism of Javanese Communities

Ancient Mataram Culture is an inland culture that has ritual and mystical powers before the inclusion of Islamic Mataram. In the 8th century there were two styles of empire as well as forming the beliefs of the people, namely the Syailendra Dynasty (Buddha) and the Sanjaya Dynasty (Hinduism). Abdillah (2016: 124) asserts that "Hindu and Buddhist beliefs affect many cultural lives that take place in traditional arts and folk art. Society still believes in supernatural forces found in sacred objects. In the days of Ancient Mataram, temples were built and made a place of worship and a place to store the bodies of the ancestors".

After the entry of Islam and the arrival of Dutch colonialists in particular, based on the Giyanti Agreement, Mataram was split into two, namely Mataram Surakarta and Mataram Yogyakarta. The culture of Mataram that enters the Ponorogo region is the culture of Mataram Surakarta, because Surakarta is more progressive than Mataram Yogyakarta. Mataram Surakarta was even known to have the largest army in its day. According to Abdillah (2016: 129) "Mataram in the early 17th century AD was a small kingdom that believed itself to be able to control Java. Mastery of Java was the main objective of Mataram, so various methods were carried out. For the Eastern region, the cultural target of Mataram is Gresik which at the time was still under the authority of Tumenggung Surabaya. Mataram was one of the major kingdoms after the collapse of the Majapahit kingdom. Mataram is also known to have dance works created by its kings, as mentioned Dwiyanto (2009: 19), namely Beksa Lawung, Beksa Sekar Madura, Beksa Wayang, Beksa Tameng and Wayang Wong which are the works of Sultan Hamengkubuwono I from the Kingdom / Kraton I Mataram Yogyakarta.

Ponorogo is an area famous for its Reyog art. This art is identical with Barongan and Peacock and the dancers consist of Bujangganong, Klono sewandono the Warok, and the Jathilan demonstrates a neat and energetic colossal ballet. Next is one of the Reyog groups from the Sanggar Aglar Dance Company.



Figure 10. Member of the Aglar Company Dance Studio

## 2. Conservation of Mataraman Culture and its management in Sanggar Reog Ponorogo and Aglar Company Dance

Ponorogo Regency is an area that geographically follows East Java, but is culturally inclined to the Central Java region. (Sugiarso, 2003: 61). The love of the community in Reyog art is evidenced by the number of Reyog groups that existed in Ponorogo before independence in Ponorogo had a Reyog group of 385 consisting of 300 villages. Each village has one or more Reyog groups (Bikan, interview 27 October 2018 in Pulung Ponorogo). This was also reinforced by Simatupang (2013: 241) that in 1999 there was not a single district that did not have Reyog. Reyog became the identity of the people of Ponorogo, and even there was a festival of Reyog performances held every year and participated by participants from all over Indonesia, thus placing Reyog as the identity of the Indonesian people. For the people of Ponorogo, their love for Reyog is likened to instinct. This is reinforced by Simatupang's statement (2013: 21) how it is possible that a Reyog that is clearly created by humans is understood as an instinct, namely the psychological element that is integrated with the human biological body. The meaning of instincts by Simatupang is captured as a tradition that is deeply rooted in the habits of the past. This is a result of long learning and as a "social reflex". Certain habits that are considered positive for the community will be expanded to maintain them.

The characteristics of reyog performances do not involve the practice of possession, reyog music combines pelog and slendro musicians, there are several roles, namely jathilan dancers who ride horses brought by men who are women, warog (local heroes) who are considered as Reyog leaders (Simatupang, 2013: 123).

In its development, the arts organizations in Ponorogo can be grouped into two, namely the Reyog organization owned by the village or sub-district and the studio organization. Reyog organizations owned by villages or sub-districts usually only perform Reyog art at festivals, the anniversary of the country's birthday. There is no special training, all facilities are village owned. Reyog in this group is still orthodox and upholds the existing guidelines. Medium studio organizations are usually more open and follow developments. One of the studios that preserves Reyog is Aglar company dance, led by Shodiq Pristiwanto.

Shodiq Pristiwanto is a graduate of ISI Surakarta. He was the founder of the Sanggar Aglar Dance Company in 2004, which taught Reog dance and Reog Ponorogo music. Shodiq Pristiwanto has a passion and a strong desire to produce new works according to the times. The several dance works that have been produced include: Lebur Seketi Dance, Kang Potro Dance, Si Potro, Devide Et Impera, Mahaputra Sang Utra Wengker and so on. The dance work created raised figures, Ponorogo's regional artistic potential, and local cultural values of Ponorogo. Most of his dance work developed Reyog art. Besides teaching various other traditional dances such as the dance of the Peacock, Girang-Girang, Gambiyong, and Rampak, also Reog children (Catharina, 2018)

Sanggar Aglar Company Dance is an arts organization that gives people the opportunity to learn art (dance, music, theater). This studio can be a laboratory for its members to do various explorations in discovering new ideas, for example discovering the experience of the dancer's body in playing scenes in a story for Reyog's performance. Studio is managed professionally to organize training. Reyog in this group as done in two religious groups in Central Kalimantan as well as in East Kalimantan that can be affiliated with each other with politics, social change and finally can bring up new genres (Hermans, 2016)

From the discussion above it can be concluded that the management system of dance studios in East Java is apretensive, namely the organization of the teaching / training component consisting of master artists as trainers or instructors, aprentis or students and art procedures as material for teaching (Soehardjo, 2005) Founder Studio at the same time is a master who has the main advantages that were not owned by anyone before the dance studio. The process of transfer of culture or

art implies the inheritance of art with a narrow target because its existence is not between two generations of macro nature.

In carrying out their duties, the studio owner has various works, namely art material, students, infrastructure, finance, relations with the community and teachers (Rohiat, 2012). Each studio has a different mission, learning and material learned and performed at the studio is a legacy from the predecessors can also be sourced from the academic world. Heritage in the form of art genres such as Puppet Mask, Reyog complete with supporting elements in the form of accompaniment, making masks and property are also studied, material is also developed from the artists' creations. Students from the studio are people who have a love of art and a sense of belonging and are afraid of losing their arts and culture. Infrastructure facilities are obtained from self-financing and managed from the efforts of artists. Community relations are built through the performance of dance work and collaboration from different studio communities.

Dance studios have an ongoing relationship with efforts to preserve and preserve culture. All the ideals and activities of dancing are holding fast to the culture inherent in the community. Thus, the management of dance studios remains attached to their cultural outlook on life. The managerial pattern begins with an understanding that a dance studio is not a commercial institution or a moneymaker. However, a dance studio is a place where community members gather to preserve and maintain the cultural values they hold. The first and foremost activity carried out was to understand the culture that was to be built in the dance studio. The cultured pattern is applied in daily life. This is consistent with Sjholm's (2013) view of the studio as a center for individual creative activities and products of science, experiments in skills practice. Sanggar is also a place to present old and new works as artists' control and evaluation of their artwork.

In addition, art studios must remain responsive and be able to seize opportunities and cultural symptoms in society. In the post-reform era where cultural politics and the discovery of the rise of public traditions are popularized as a reflection of the current dynamics between Islamization, policy making, and culture open to various negotiations and individual interpretations. . In the city of Gede, Yogyakarta, the modification of local religious rituals was used as a tourist event for economic reasons. accepted in an increasingly Islamized environment (Schlehe, 2016). .

The commitment of financing dance studio activities is loose or flexible with the aim that all members of the community can be involved in preserving and maintaining its culture. The community also feels comfortable and believes in the

way that a dance studio should do, so that the dance studio runs its managerial process simply and adapted to the needs that exist. However, some dance studios get help from local and central government in Jakarta. Assistance can be in the form of support by providing "work" to prepare dance performances to equipment procurement, and renovation of dance studios. For managers of dance studios, support from the government is taken for granted without any ties. Although at various levels there is assistance with a tendency to support political interests. Such conditions are often difficult for the managers of dance studios.

Members of the Padepokan Mangun Darma dance studio in Malang are more "closed" than the Tarara dance studio in Bangkalan and the Singo Aglar Nuswantoro studio in Ponorogo. Membership closure is more due to rather specific choices in the production process. For millennial youth and students, they are less able to follow the managerial pattern that is relatively very specific to Malangan culture or Arek culture. Some members have kinship ties in order to understand special cultural characteristics as applied by Padepokan Mangun Darma Malang.

Tarara Dance Studio in Bangkalan and Singo Aglar Nuswantoro Studio in Ponorogo do not have a management pattern that requires their members to carry out certain ritual activities. Both of these studios directly prepare the production of performances and do exercises to learn dance for mastering the skills of a dance work. Members of Tarara dance studios in Bangkalan and Sanggar Singo Aglar Nuswantoro in Ponorogo are people who want to cultivate their personalities through dance work based on local culture. The Tarara dance studio in Bangkalan concentrates its production work on Madura culture, while the Singo Aglar Nuswantoro Studio in Ponorogo focuses its production work based on Mataram culture including Reyog art.

Tarara dance studio in Bangkalan and Singo Aglar Nuswantoro studio in Ponorogo have a more open membership, even the production is adjusted to the needs of members, such as modern and contemporary dance. However, these works still have ties with their respective cultures. In the context of these two dance studios are often referred to as "reinterpretation of tradition" or "dance creation / arable" with a modern or contemporary genre.

#### **4. Implications of findings**

1. Art galleries play an important role in the preservation of performing arts in East Java. Saerani and her research team (2014) said Sanggar's non-formal education in Yogyakarta facilitated the



teaching-learning process, cultural transformation, and was very effective as a cultural center. It was also mentioned that the non-formal education studio existed until now because there is a pattern of management. The role of the studio is very varied in the community, all of which are for the preservation of art. The preservation of art is in essence a tenacity to maintain the noble values of the traditions of the community as a form of cultural resilience owned by the community.

2. Dance performance, music, drama are studied by the next generation in Dharma Mangun Studio, Tarara Studio, Aglar Company Dance Studio. by practicing. Purnama (2015) The role of the studio in traditional arts as a container / shelter for a number of cultural arts, as a media of education both education and training, as a medium of entertainment for the surrounding community and art enthusiasts, as a place to set strategies around art that are occupied as a place to stay in touch (gather and discuss) in order to strengthen brotherhood. The role of the studio as a place to practice dance or art transformation in the next generation According to Saerani with his research team (2014) said that the non-formal education of Sanggar in Yogyakarta facilitates the teaching-learning process, cultural transformation, and is very effective as a cultural center.
3. Artists as the leaders of the studio have a complex claim that includes material arts, creating new art, staging works of art, completing infrastructure of works of art. So that the artist really determines the life of the studio's demise. Besides that there is a creative process in the form of cultivation, creation, revitalization and the like also done by the community in the studio (Hawwa, 2015).

## **5. Conclusion**

The management of dance studios in East Java has a unique variety, due to the contestation of the heirs of the studio, the strength of tradition being the basis of work, and the dynamic growth of art. Through the

development of tradition as a basis for the discovery of new broader forms. This effort was made to strengthen and preserve the arts. The studio managers continue to struggle in order to maintain and preserve the arts together with the community to strengthen their community. Dance studios in East Java have several types of activities, namely training, dance performances, ranging from rituals to order art, making supporting elements of dance (property / mask, dance clothing) and rental, creation. In this millennial era, the sustainability of the studio needs the support of all parties to preserve the arts and strengthen national identity.

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## Chapter 22

### Does Funding Decentralization Can Influence The Local Economic Growth?

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**Abstract** - Funding decentralization, public expenditure, Local economics activities, of county/cities in East of Java can be provide positive the effect on local economic growth. The purpose of this research to increased funding decentralization as balance grants to regional autonomy policy can be used to finance local goverment and public expenditure for increased local economics growth in East of Java. Methods of this research used explanatory design with quantitative approach. Analysis techniques of this research using panel data regression model with Eviews program. Result of the this research can be concluded as follows: (1) Funding decentralization proven to provide effective positive on the amount of public expenditure. (2) Funding decentralization proved to have a positive effect on local economic activities. (3) Funding decentralization in regional autonomy policy can be foster local economic growth. (4) Local economic growth proved have a positive effect to increase welfare society. In the generally, increasing decentralization of funds as well as possible to foster the areas industry activities, and this areas in an effort to increase local economic growth of autonomous regions.

**Keyword:** Funding Decentralization, Public Expenditure, Local Economic Growth, Sustainable Development, Local Government, Public Finance, Regional Autonomy.

#### 1. Introduction

Fiscal decentralization may indeed have a direct impact on economic growth but the theoretical underpinnings for this relationship remain largely undeveloped. Robert (2003) says, implement decentralization programs on the basis of improving the rate of economic growth. In the fact, funding decentralisation simply means empowering local source to collect their own taxes, on expenditure and investment activities among others independent of the central

government, with the degree of autonomy varying from countries. Based on Act No. 25 of 1999 law of Regional Autonomy then changed to Act No. 33 of 2004, law of Regional Autonomy, declared that the decentralization fiscal policy embodied in the form of balancing funds. This balancing fund allocation policies, that are intended to: (1) empower and improve regional economy capabilities; (2) creating a regional financing system that are fair, proportionate, rational, transparent, participatory, accountable, and certainly, and (3) realize balancing financial system between central and local governments that reflect division authority and responsibilities clearly between central and local governments.

As Bird and Vaillancourt (2010) classifies three ways are used as the basis for setting state funds that allocated through intergovernmental fiscal transfers, namely: (1) comply with fixed percentage of the central government revenue, (2) comply with ad hoc basis, is the same way of the types of other budget expenditures, and (3) on the basis of mechanisms formula that is follow the percentage of certain regional expenses paid by the central, or in connection with some common characteristics receiving areas. The third variation of this method can be found all around the world. In Indonesia, budget for operational cost of county and cities formula in determining how much the funds proportional in accordance with the mandate of Act No. 33 of 2004 very concerned about local economic activities in determining the important of variable fiscal needs. This variable is very important in realizing the objectives of national development more equitable and evenly. It is as mentioned in Article 28 paragraph 2 of Act No. 33 of 2004 law of regional autonomy, which explained that every local fiscal need as regional need to carry out basic public services which should pay attention to the local economic growth.

Funding decentralization is very supporting toward local economic growth in East of Java, Indonesia. According Morosoz (2016), theoretical and empirical reviews known that local economic activities is influenced positively and significantly through funding decentralization policy and to increase local economic growth. Given the importance of this local economic activities, then Act No. 32, 1999 Article 7, law of regional autonomy, were revised in Article 33 to 34 of Act No. 33 of 2004 include local economic activities in regional government. Felix (2015) says, the use of local economic activities, certainly have a variety of considerations and reasons for the government, because the development local economic activities is local economic growth, so that this aspect should get priority in budget preparation. In addition, East of Java is need to improve and to increased about local economic activities for local economic growth.

Policy of funding decentralization in East of Java, can be support toward local



economic activities, so will be foster local economic growth. According Noor (2014) funding decentralization policy applied to date is not an end, but as a means to an end in local economic growth in regional government. Results of this study are expected to provide input to the government in order to implementation of funding decentralization remains in line with that goal. Since the implementation of the funding decentralization policy began in January 2001 to the present there have been changes to the funding management has been dominated central government switched to local governments.

Funding decentralization policy is expected in the area of funding management be able more effectively and efficiently, so as to increased local economic activities and than can be improving for local economic growth. So, research about funding decentralization in East of Java is very importance to foster local economic growth through increase local economic activities for welfare society. Need the finding about the importance of funding decentralization for increase local economic activities and determinant of flexible funding management to foster local economic growth.

This studies is expected to provide useful information, especially for other researchers who want to deepen funding decentralization to improved local economic growth efforts. How much importance of funding decentralization for increase local economic growth, will be explanation in this research. It is expected that other researchers can conduct further research by observing other variables comprehensively to analysis local economic growth in East of Java.

## **2. Literature Review**

### **2.1. Theoretical Review**

Ramez and Lean (2017), and Martinez and McNab (2007), says decentralization is generally defined as the power transfer process in making decisions on subnational governments. Meanwhile, according to Morosoz (2017); Nicola (2016); distinguishes decentralization be : (a) geographical decentralization or territorial decentralization, namely division of a region into smaller areas with a clear jurisdictional authority between these areas; (b) functional decentralization is distribution of authority and state responsibility to various functional units in an administration ; (c) political and administrative decentralization. Political decentralization concerned with decision-making authority shifting from higher to lower levels of government. In this context of local communities participation in decision-making processes get very broad opportunity. Mankiw (2009) said while the administrative decentralization is closely related to political decentralization,

both factually is indistinguishable. But more focused on operationalization or implementation of public policy/decision in order to succeed as optimally; (d) financial decentralization, which is related to responsibility transfer for expenditure and revenue of the central government to local governments.

The implementation of fiscal decentralization and regional autonomy, Ministry Finance (2017) says, based on Act No. 22 of 1999 on Regional Government and Act No. 25 of 1999 on Financial Balance of the Central Government and the Regions (amended into Act No. 32 of 2004 and Act No. 33 of 2004) has given broad authority and tangible to local governments to manage and organize resources in accordance with the interests of a local community. The local government authorities to establish development priorities in accordance with potential and resources it has. (Central Bureau, 2015). The main mission of the fiscal decentralization policy is to improve quality and quantity of public services and people welfare, create the effectiveness and efficiency of resource management areas and created a space for people to participate in the development process (Bappenas, 2014). Another reason of fiscal decentralization promoted because of the urgency to provide government services more efficient and aspirational.(Gierson, 2008; Irfan, 2009)

Related to financial decentralization, Roland (2011) says, as decentralization in the economic field that the delivery of some government authority to local governments to implement the allocation function, distribution and stabilization functions, aims to regulate and manage the region's economy in order to create stability in the national economy (Sugiyono, 2013 ). All three functions under the authority and responsibility of the central government. However to go to the government system more effective and efficient, much of the authority and responsibility of the central government devolved to local governments, which remain part of the authorities and responsibilities are still controlled by the central government, such as policies that govern the macro-economic variables. According Mfaniseni (2003), Bird and Vaillancourt (2010), that the key and main components in decentralization policy is fiscal decentralization, due to funding decentralization make financial management authority becomes larger. Definition of funding decentralization is the authority delegation to the regions to explore and use their own resources in accordance with regional revenue potential respectively. Furthermore, many experts stressed the need for fiscal decentralization to improve economic efficiency, cost efficiency, improved accountability, and increased mobilization of funds (Richard, 2015).

Theoretically this study describes the impact of fiscal decentralization on public expenditure, economic growth, a decrease in the amount of poverty, as well

as to human development. The theories developed in this study is a departure from the decentralization theory (fiscal) which includes. Concept and definition of decentralization, the goal of funding decentralization, decentralization instruments, transfers intergovernmental, funding decentralization and local government functions, theoretical relationship between funding decentralization on economic growth, economic growth model taking into account central and local governments, economic activities in economic growth.(Craig, 2000; Corinne, 2017).

## 2.2. Framework conceptual Thinking

Thinking framework and concept of this study was based on a review of theoretical and empirical that has been compiled. Thinking and conceptual framework of this study refers to the theoretical and empirical arguments earlier. The concept of this study can be seen Figure 1.

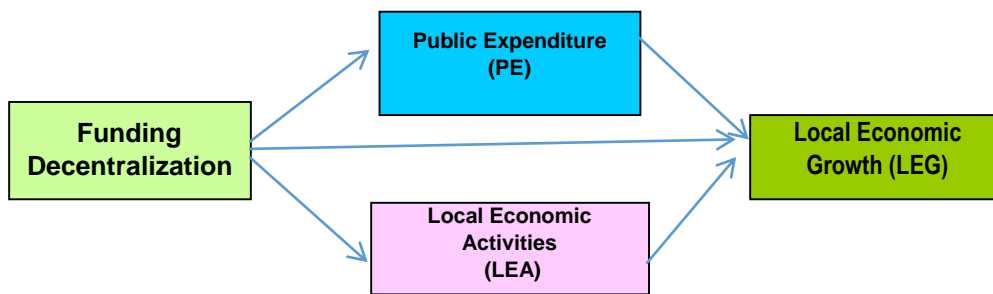


Figure 1. Conceptual Framework Research

## 2.3. Hypotheses

1. Funding decentralization supposedly has positive effect on public expenditure in regional autonomy.
2. Funding decentralization supposedly has positive effect on local activities economic
3. Funding decentralization supposedly has positive effect to increased local economic growth.
4. Local economic growth supposedly has positive effect for welfare society.

### **3. Research Methods**

This research used explanatory design to empirically the relationship and effects among variables of funding decentralization, public expenditure, local economics activities of 38 county/cities in East of Java. The county and cities on East of Java is: 1.Pacitan, 2.Ponorogo, 3.Trenggalek, 4.Tulungagung, 5.Blitar, 6.Kediri, 7.Malang, 8.Lumajang, 9.Jember, 10.Banyuwangi, 11.Bondowoso, 12.Situbondo, 13.Probolinggo, 14.Pasuruan, 15.Sidoarjo, 16.Mojokerto, 17.Jombang, 18.Nganjuk, 19.Madiun, 20.Magetan, 21Ngawi, 22.Bojonegoro, 23. Tuban, 24.Lamongan, 25.Gresik, 26. Bangkalan, 27.Sampang, 28.Pamekasan, 29.Sumenep. And the Cities is: 30.Kediri, 31.Blitar, 32.Malang, 33.Probolinggo, 34.Pasuruan, 35.Mojokerto, 37.Madiun, 37.Surabaya, and 38.Batu. County and cities in East of Java, as well as increasing local economics growth to improve welfare society. This study was conducted to determine the effect of fund decentralization on local activities economics and local development economics at county/cities in East Java, using data panel city and town in East of Java. This study focused on the realization of the revenue and expenditure of the local goverment, balance fund, local activities economics and local economic growth.

Data that used in this study are secondary data from the Centered of Bureau Statistic (BPS) from county and cities in East of Java and other institutions related to the study. Research variable is independent and dependent variables. Independent variables is: (1.) Variable of funds decentralization in relation to public expenditure variables (2) variable of funds decentralization to local economic activities. (3) Variable of funds decentralization to regional economic growth. (4) Variable of funds decentralization and economic growth in relation to local economic growth. (5) variables of public expenditure, funds decentralization, local economic growth, as well as to increase local economic growth. And the data of dependent variables is: (1) Public expenditure variable in relation to funds decentralization. (2) local economics activities variable in relation to local economic growth, (3) Local Economic growth variable in relation to funds decentralization.

#### **3.1. Model and Analysis Techniques**

##### **a. Model Analysis**

Model analysis is a summary of the theory that is often expressed in mathematical formulation. This model describes fundamental relationship between variables of concern. Because it described is subject relationship, then model can clarify relationship between variables emphasis to other variables.

Model analysis of this study is to use regression.

### **b. Analysis Technique**

Analysis techniques of this research using panel data regression model with Eviews program. According to Winarno (2007), Eviews is a computer program used to process statistical and econometrics data. This program can be used to solve problems in the form of time series, cross section, and panel data. (Sugiyono, 2013). Time series is the data of an object consisting of several periods. Cross section is data multiple objects at a time. While the data panel is the data have characteristic both time series and cross section, consists of multiple objects and covering several periods. This study uses data panel from 2014 to 2018 years.

### **3.2. Equation Model for Estimating the Effect of Decentralization Fund Toward Public Expenditure Autonomous Region Variable.**

Model equation of this study refers to the research model of Suyanto (2009), Langoday (2006), as well as Khusaini (2006). Decentralization fund expected positive effect of increasing public expenditure, thus increasing decentralization fund increase public expenditure of autonomous region. Based on this rationale, mathematically public expenditure (PE) was formulated:

$$PE = f (DF)$$

where: PE is public expenditure autonomous regions; DF is the decentralization funds of autonomous regions. Model equations to estimate the effect of decentralization fund (DF) toward public expenditure of counties and cities formulated as follows:

$$PE_{it} = \beta_0 + \beta_1 DF_{it}$$

Where:

PE : public expenditure

$\beta_0$  : constant.

$\beta_1$  : regression coefficient.

DF : decentralization fund

### **3.3. Equation Model for Estimating the Effect of Decentralization Fund toward Economic Growth Variables of Autonomous Region.**

Decentralization funds expected positive effect on the regional economy growth rate, which means that increasing decentralization funds will improve the

economy of the autonomous region. On the basis of this thinking, mathematically economy growth rate (PE) formulated:  $PE = f(DF)$ , where in: PE is public expiditure; DF is the decentralization funds of autonomous regions. Model equations to estimate the effect of decentralization fund (DF to economic growth rate of county and cities were formulated as follows:

$$PE_{it} = \beta_0 + \beta_1 DF_{it}$$

Where:

PE : public expiditure

$\beta_0$  : constant.

$\beta_1$  : regression coefficient.

DF : decentralization fund

#### **3.4. Equation Model for Estimating the Effect of Decentralization Fund and Public Expiditure Variable toward Local Economics Activities.**

To estimate the equation behavior in order to test that the decentralized fund variable and public expiditure of autonomous county and cities has positive effect toward local economic accivities, then made specification equation based on the functionality. Decentralization funds is expected to promote local economic activities, and welfare society. On the basis of this thinking, the function is mathematically formulated as follows:  $LEA = f(DF, PE)$ ; Where LEA is local economic activities of the autonomous county and city; PE is an public expiditure; DF is decentralized funds.

The equation model to estimate the effects of decentralization funds and local economic growth of county and cities can be formulated as follows:

$$LEA_{it} = \beta_0 + \beta_1 DF_{it} + \beta_2 PE_{it}$$

Where:

LEA : Local Economic Activities.

$\beta_0$  : constant.

$\beta_1$  : regression coefficient

DF : decentralization fund

PE : variable public expiditure

### 3.5. Equation Model for Estimating the Effects of Decentralization Fund, Local Economic Activities, Public Expenditure, and Local Economic Growth

Local economics growth is to development a complete East of Java welfare society. This policy is implemented by decentralization fund to empowerment local economic activities, as well as improved welfare society. On the basis of this thinking, then mathematically, local economic growth of county and cities in East of Java can be formulated as follows:  $LEG = f(DF, PE, PI, LEA)$ ; where LEG is a local economic growth; DF is decentralization fund; PE is public expiditure; PI is percapita income; LEA is local economic activities; of autonomous county and city in East of Java. Model equation to estimate the Influence of funds decentralization, economic growth, public expenditure, as well as local economic activities variable local economic growth of the autonomous county and cities are as follows:

$$LEG_{it} = \beta_0 + \beta_1 DF_{it} + \beta_2 PE_{it} + \beta_3 LEA_{it}$$

Description:

LEG : Local Economic Growth .

$\beta_0$  : constant

$\beta_1, \beta_2, \beta_3, \beta_4$  : Regression Coefficient.

DF : Decentralization Funds

PE : Public Expiditure

LEA : Local Economics Activities

## 4. Results and Discussion

### 4.1. The Effects of Funding Decentralization Toward Public Expenditure.

The Results analysis of the effects of decentralization fund (DF) variable toward public expenditure (PE), which was conducted using panel data and documentation sources showed a significant effect. Significant effect of the decentralization fund result toward public expenditure is supposedly due to decentralization funds as balancing fund as the main source of budget revenue in each autonomous region. Analysis of the effects of decentralization funds toward public expenditure can be seen in Table 1.

Table 1. The Effects of Decentralization Fund toward Public Expenditure of Autonomous Region

Variable	Coefficient	t statistic	Remarks
Konstanta	1.56E+08	7.877129	
DF	0.248066	6.50286	Significant
R <sup>2</sup>	0.253862		
t Tabel	2.576		
α	1%		

Source : Secondary data is processed

The model equations based on the results of the above analysis are:

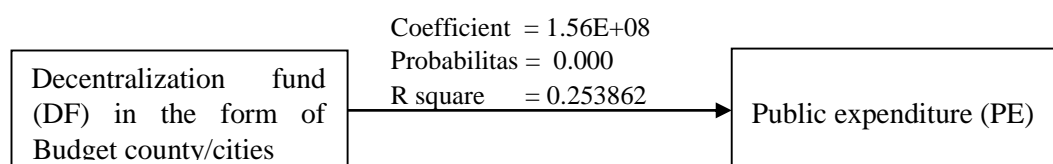
$$PE = 1.56E + 0.248066 DF \quad (4.1)$$

$$t \quad 7.877129 \quad 6.50286$$

$$\text{Prob} \quad 0.0000 \quad 0.0000$$

$$R^2 = 0.253862$$

Based on the results of t-test, decentralization fund (DF) variable were statistically significant effect on public expenditure (PE). It is evident from the t value of 6.50286. This value is greater than t table ( $6.50286 > 2,576$ ) and a probability value of 0.0000, this value is smaller than  $\alpha = 0.01$ , respectively. Results of this analysis showed a significant effect of the variable fund decentralization on public expenditure . Results of the analysis described above can further be seen in Figure 2.



Source : data secondary is processed

Figure 2. Effect of Decentralization Fund toward Public Expenditure



#### 4.2. The Effects of Funding Decentralization Toward Local Economic Activities.

Results analysis of the effect of decentralization fund (DF) variable toward Local economic activities (LEA), which was conducted using panel data for observations showed possible significant positive results. Results analysis of the effect of decentralization funds on economic activities can be seen in Table 2.

Table 2. Effects of Decentralization Fund toward Local Economic Activities

Variable	Coefficient	t statistic	Remarks
Constanta	5.093366	14.78434	
DF	3.40E-10	0.813877	Insignificant
R <sup>2</sup>	0.626522		
T Tabel	1.645		
α	10%		

Source : Analysis result is processed

The model equations based on the results of the above analysis are:

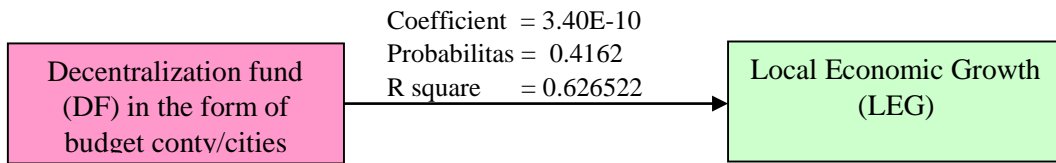
$$PE = 5.093366 + 3.40E-10 DF$$

$$t \quad 7.877129 \quad 6.50286$$

$$Prob \quad 0.0000 \quad 0.4162$$

$$R^2 = 0.626522$$

Based on the results of t-test, decentralization fund (DF) has not statistically significant effect toward local economic activities growth (LEA). It is evident from t value of 0.813877. This value is smaller than t table (0.813877 > 1,645) and a probability value of 0.4162, this value is greater than  $\alpha = 0.10$ . Results of this analysis showed there is no significant effect of the fund decentralization on local economic activities. It is supposedly that decentralization funds transferred to the autonomous regions has been distributed to financing public services expenditure and regional development. Results of the analysis described above can be seen in Figure 3.



Source : Analysis result is processed

Figure 3. Effects of Decentralization Fund toward Local Economic Growth

#### 4.3. The Effects of Funding Decentralization Toward Local Economic Growth.

The analysis result of the effect of decentralization funds and local economic activities toward wlocal economic growth can be seen in Table 3.

Table 3. Effect of Decentralization Fund Activities toward Local Econmic Growth

Variable	Coefficient	t statistic	Remarks
Constanta	68.35482	8.966515	
DF	8.76E-09	3.985565	Significant
LEG	-0.008828	-0.002839	Significant
R <sup>2</sup>	0.980376		
t table	2.576		
α	1%		

Source : Secondary data is processed

The model equations based on the results of the above analysis are:

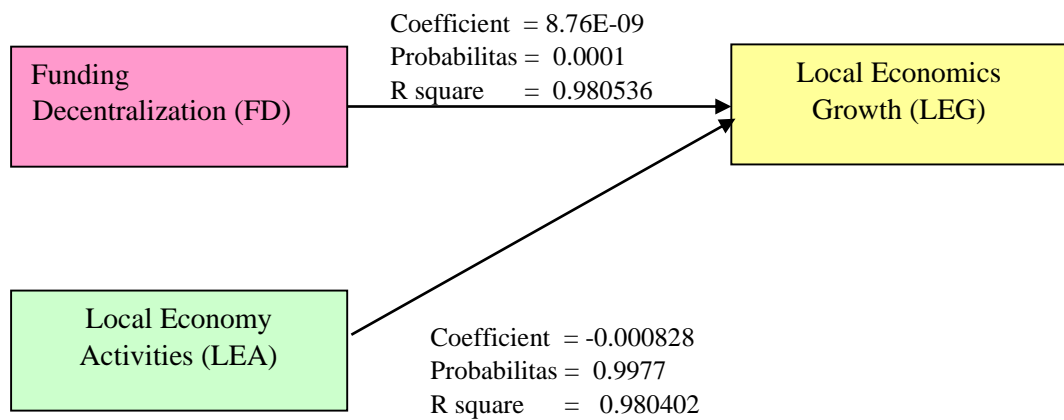
$$\text{LEG} = 68.35482 + 8.76\text{E-}09 \text{ DF} - 0.000828 \text{ PE}$$

$$t \quad \quad 8.966515 \quad 3.985565 \quad -0.002839$$

$$\text{Prob} \quad 0.0000 \quad 0.0001 \quad 0.9977$$

$$R^2 \quad = \quad 0.980376$$

Determination coefficient value (R<sup>2</sup>) of 0.980376. This means that decentralized funds (DF) was able to explain local economic growth (LEG) of 98.04 percent. While the rest, i.e. 1.96 percent is explained by other variables outside of the model equations. This model Analysis can be seen in Figure 4.



Source: Analysis result is processed

Figure 4. Effect of Funding Decentralization and Local Economic Activities toward Local Economics Growth

#### 4.4. The Effects of Decentralization Fund toward Local Economic Activities

Based on the t-test result, decentralization fund (DF) variable statistically has significant effect on Local Economic Aktivities (LEA). It is evident from the t-value of 3.985565. This value is greater than t-table ( $3.985565 > 2,576$ ) and a probability value of 0.0001, this value is smaller than  $\alpha = 0.01$ . Thus, there is a significant effect of the decentralization funds to local economics activities variable.

#### 4.5. The Effects of Local Economic Activities toward Local Economic Growth

Based on t-test results, the variables of local economic activities (LEA) give a statistically significant effect on local economic growth (LEG). It is evident from the t value of -0.2839. This value is large than t-table ( $-0.2839 > -0.1645$ ) and a probability value of 0.9977, this value is greater than  $\alpha = 0.10$ . Thus, there was no significant effect of the variable of local economic activities on local economic growth. It is supposedly to increase the growth has been followed in local economic growth.

#### 4.6. Funding Decentralization Policy, Local Economics Activities and Local Economics Growth toward Welfare Society.

The analysis results of the variables effect of decentralization fund (DF), public expenditure (PE), and Local economic activities (LEA), toward local economic growth (LEG) which was conducted using panel data on 400 observations can be seen in Table 4.

Table 4. The Effects of Funding Decentralization, Local Economic Activities and Local Economics Growth.

Variable	Coefficient	t statistic	Remarks
Constanta	69.80728	129.8076	
DF	1.12E-09	6.090260	Significant
PE	0.057166	2.409171	Significant
LEA	9.49E-10	3.838080	Significant
LEG	-0.014329	-3.852457	Significant
R <sup>2</sup>	0.962618		
t tabel	2.576	1.960	
α	1%	5%	

Source: Secondary data is processed

The model equations based on the results of the above analysis are:

$$\text{LEG} = 69.80728 + 1.12\text{E-}09 \text{ DF} + 0.0572 \text{ PE} + 9.49\text{E-}10 \text{ LEA} - 0.0143 \text{ LEG}$$

t	129.8076	6.090260	2.409171	3.838080	-
Prob	0.0000	0.0000	0.0165	0.0001	0.0001
R <sup>2</sup>	= 0.962618				

Determination coefficient (R<sup>2</sup>) value of the equation by 0.962618. This means that decentralized funds (DF), Local Economic Growth, Public Expenditure and Local Economic Activities Economic (LEA) able to explain the local economic growth (LEG) of 96.26 percent. While the rest, i.e. 4.74 percent is explained by other variables outside equation of the model equations. If equation (4) described one by one (t-test) for each variable, it will be seen as a whole, as

Figure 4. The effects of decentralization funds toward local economic growth overall in this research can be seen in Figure 5.

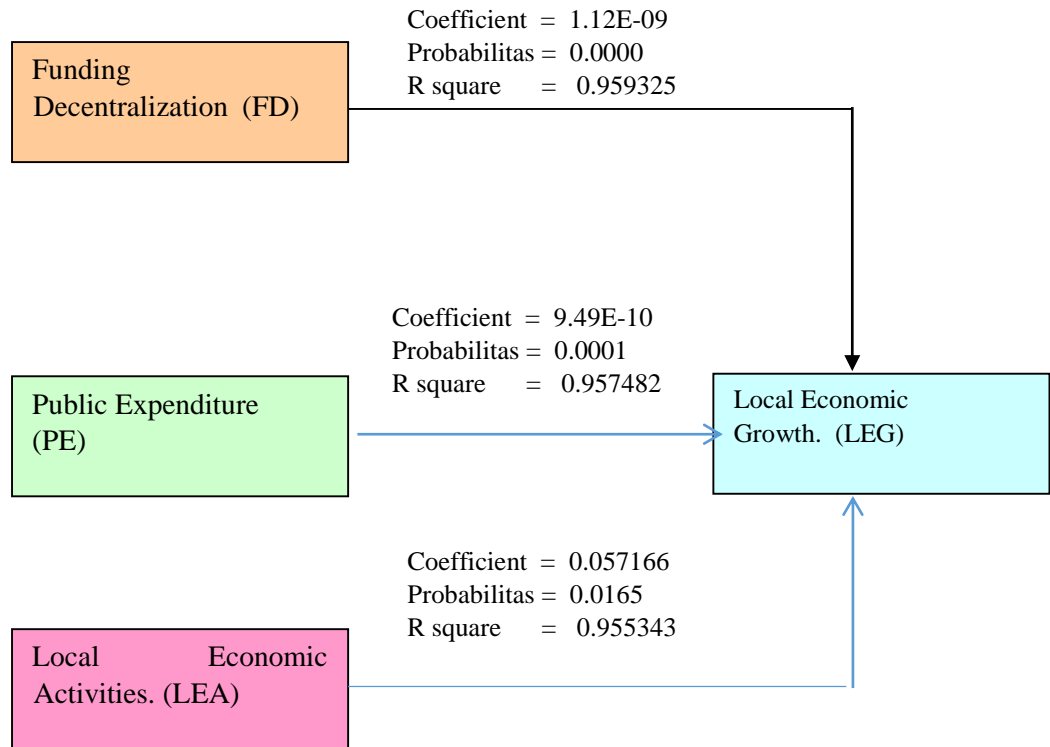
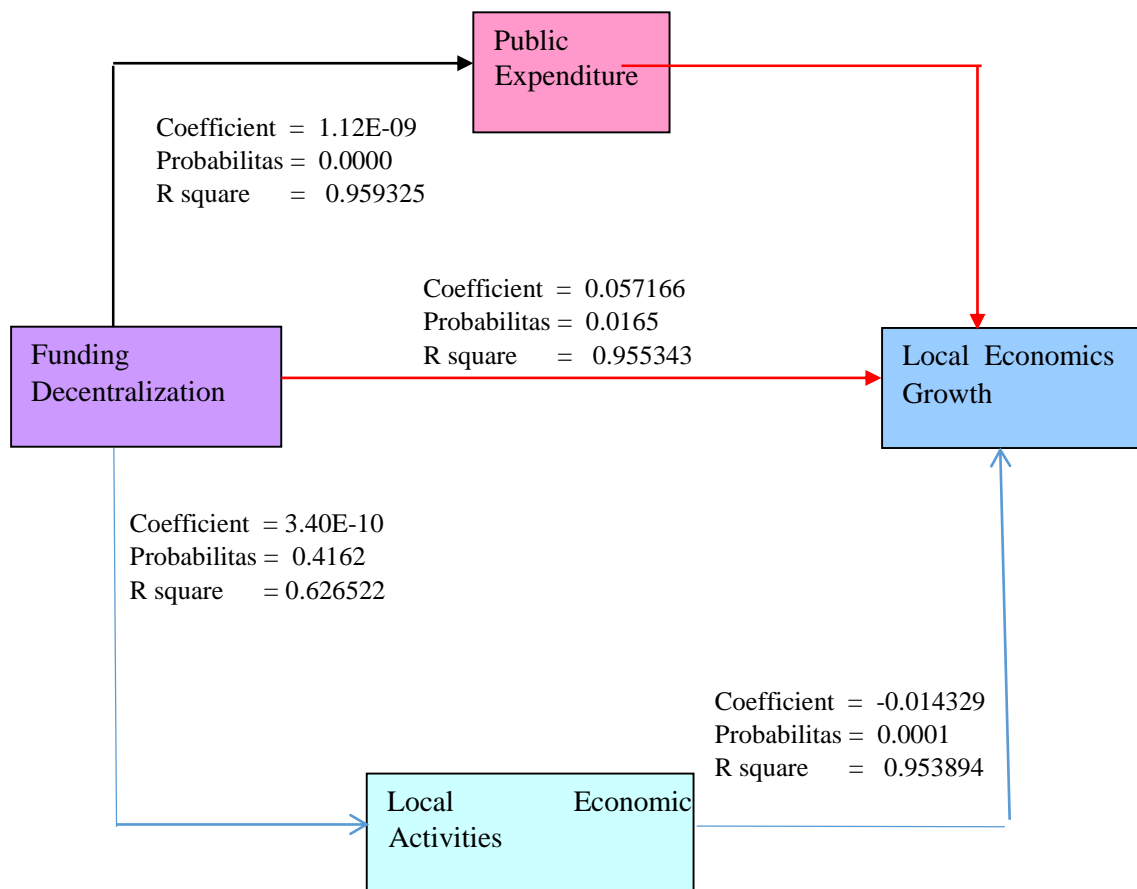


Figure 5. The Effects of Funding Decentralization, Public Expenditure and Local Economic Activities toward Local Economics Growth.



Source: Analysis result be processed.

Figure 6. The Effect of Funding Decentralization toward Local Economic Growth

Partially, this study found that funding decentralization policy, local economic activities, as well as public expenditure are all giving a significantly positive effect on the local economic growth of autonomous region counties and cities. This shows that the funding decentralization policy has been increasingly effective for increase local economic growth.

### 1. Related Funding Decentralization Management Public Expenditure

Some of funding decentralization related regional public management are influenced by many factors, among others, factors of human resources in the

regions and central, capability of local bureaucracy and local institutional capacity, as well as factor of legal apparatus that are less consistent and frequent changes. These factors can lead to autonomy and funding decentralization is not running optimally, as well as many things that should be improved to promote economy growth rate, as well as local economic growth.(Ahmad, 2013; Dobrovic, 2016; Daniela, 2016).

## **2. Funding Decentralization Policy Perspective to increase Local Economic growth**

Implementation of the funding decentralization policy that goes well, it is required efforts to strengthen local governments policy. Strengthening local governments capacity have begun to evaluate performance of the regional administration, through monitoring and evaluation, as well as special treatment for problematic areas. Mary (2017; Newman, 2015) says, the evaluation mainly outcome (impact) of the policy areas, such as evaluating the impact of public services, health, and education. For local governments failing to organize autonomy and welfare of its people, the central government did not hesitate to merge its territory, whether it's provincial, district and city with other areas.(Irina, 2016; Haslinda, 2016; Darlenne, 2015). Evaluation of local government is contained in Government Regulation No. 6 of 2008 on Guidelines for Evaluation of Regional Government, this law is a command to Act No. 32 of 2004, Article 6 paragraph 3 which reads, the area able to removed and merged with other areas if it is not able to organize regional autonomy. Efforts governance evaluation can be done through three terms; First, implementation of the local government performance evaluation. This assessment refers to the principles of good governance. Secondly, evaluation of the implementation ability of regional autonomy. At this stage, the central government will look at the ability of the region, such as social welfare, public service quality, and competitiveness. Thirdly, new autonomous regions evaluation, with monitoring of completeness aspect of the regional governance development of the newly formed regions.

## **3. Contributions for the Research**

Funding decentralization is the purpose to foster in local economic growth. The funding decentralization policy of local government is demanded to allocate expenditure appropriate with priorities local economic activities. Overall funding decentralization policy conducted has positive influence on local expenditure, local economic activities, and than can be increasingly local economic growth. Therefore this funding decentralization policy should be followed decentralization funds management efforts effective and efficient to increased local economic

growth, and welfare society.

#### **4. Limitations of Research**

Difficulty of this research, particularly when collecting research data, this is because some of the obstacles and barrier from bureaucratic. Another obstacle to the collection of research data is due to several budget data each year has undergone several changes, so researchers have to be very careful toward the budget data is used. So that data used in this study was valid and reliable, the data used to rigorously is the final realization of the implementation of the budget each year end, autonomous regions in counties and cities. Besides this, limited availability of data on the department concerned had result of this study is not in accordance with the specified target and result of this research.

#### **5. Conclusion**

The result of this research about funding decentralization policy for increasing local economic growth were assessed based on a review of theoretical and empirical can be concluded as follows:

1. The increased of funding decentralization proven to provide significant positive effect on the amount of public expenditure. It is supposedly to increased public expenditure of regional autonomy will be followed to the improvement of public social expenditure and local economics.
2. The increased funding decentralization proved to have a positive effect on local economic activities. Thus, increasing local economics activities will be foster local economics growth.
3. The increasing funding decentralization supposedly has positive on local economics growth. And than, local economics growth can be increased welfare society.
4. In general, increasing local economic growth proven to provide significant positive effect for welfare society.

#### **Recommendation:**

Increased decentralization funds from central government to autonomous counties and cities show has decentralized system of government and economy. Therefore, in accordance with the provisions of Act No. 32 of 2004 and Act No. 33 law of regional autonomous in 2004, the autonomous regional government has



the authority to regulate flexibility and decentralization fund that increasing numbers. These funds amount to significantly affect amount of expenditure autonomous region counties and cities. Consequently, the head area and the parliament should determine expenditure patterns, programs, and priority projects should be funded by the budget to promote welfare society.

Local governments, the Regent/Mayor with local parliamentary should be able to cooperate to the fullest in order to not delay budget approval, as well as accelerate budget disbursement process. It is expected that the funds can be immediately absorbed by the budget for public services and regional development in particular to promote the means basic service needs of the community. The management of budget funds which increasingly depend on the amount of balancing funds from central should be done effectively and efficiently, so that local governments and legislators could make coordination and consultation with law enforcement authorities to realize creation of good governance, so that at the end of the year their budgets are not bound by the case law because of corruption. In addition, the increasing decentralization of funds used as well as possible to the shopping areas, the planning of programs and projects related areas in an effort to increase economic growth of autonomous regions should continue to be improved, including efforts to improve the quality of local government officials in handling various projects funded government, both central and local government.

### **Acknowledgment**

The author would like to thank for Dean on Faculty of Economics from Universitas Negeri Surabaya for support funding in this research. The authors also thank to Ardiansyah, and my student for data's collection of this research. The author also wish to thank the anonymous reviewers whose suggestions helped improve the manuscript.

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## Chapter 23

### Comparative Study on Learning Outcomes between Entrepreneurship Class and Regular Class and its Effect on Entrepreneurship Motivation

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**Abstract** - Human resource can be developed through entrepreneurship education in vocational high school (VHS) to mold a skilled labor. This study aimed to compare the learning outcomes between students in entrepreneurship class (A) and regular class (B), and its effect on their entrepreneurship motivation. Subjects were chosen with proportional stratified random sampling, they were 320 VHS students from 16 VHSs in East Java. Data were collected using questionnaire with 4 level likert which has validated by trial on 30 students. Data were analyzed using descriptive statistic and Exploratory Factor Analysis (EFA) to determine learning outcomes and entrepreneurship motivation score for each indicator involved. Analysis of covariance (ANCOVA) to test effect on learning outcomes towards entrepreneurship motivation. This study showed that: 1) class A's students has better learning outcomes than class B's student, both classes's learning outcomes were supported by creative, risk-taker and action oriented indicator, while honesty, leadership and independence were the indicator that did not support; 2) class A student's has higher motivation than class B's student, both classes's motivation supported by recognition, advancement and achievement indicator, but work itself and responsibilities were the indicator that did not support; 3) there was a significant effect on entrepreneurship subject learning outcomes towards entrepreneurship motivation, there was no entrepreneurship motivation differences between A and B class. This study could become a learning model for apparel study program in VHS (policy)

**Keywords:** entrepreneurship education, learning success, student's competency.

## 1. Introduction

Entrepreneurship education has applied in most of high school in Indonesia especially in most VHS of East Java. This is engaged with human resource competent development in order to compete in the global marketplace (Susanti, 2011). Entrepreneurship education implement the principles and methodologies towards internalization of the values of entrepreneurship in learners through an integrated curriculum (Kirby, 2005). Hansemark (1998) stated that the main purpose of entrepreneurship education is to develop skills, knowledge, and character rather than giving information regarding on entrepreneurial activities. Therefore, a pedagogy is needed in teaching to train students not only for their vocational skill, but also their entrepreneur skill. Knowles (2004) believes that pedagogy assigns to the teacher full responsibility for making all the decisions about what should be learned, how it will be taught, and when that teaching will occur.

Pedagogical support regards as a complex, systemic activity of all subjects of the educational process focused on the development of the future professional in the working field (Aboimova et al, 2017). Moreover, Novikov (2010) stated that pedagogical support is recommended to be implemented based on the following principles of the organization of the educational process such as motivational and creative activity of student. In this study, VHS student was majored in fashion, apparel department which in elaborate with art and creativity. The fashion industry could be considered a mix of creativity and business (Lang et al, 2019). However, most educational approaches lack in specific pedagogical goals to successfully prepare fashion students be ready to lead in sustainability projects (Rana and Ha, 2018). While Hasanah (2011) suggested that vocational education method need to be encouraged student in utilizing existing knowledge and skills to develop business. Students feel more confident about setting up their own businesses if they can test their ideas in an educational, supportive environment (Onstenk, 2003).

Current situation in Indonesia VHS, is that not every school in East Java has an entrepreneurial class which student could spent until 6 hours per week at school for concerned about directly in the production of goods or services. However, most of vocational school, redact entrepreneurial program as a subject which has only 2 hours per week (Winarno, (2013), Hasanah (2011)). While Indonesian vocational school curriculum standardized the entrepreneurship program for 192 hours per year in which worth 32 weeks of learning effective, then it is supposed 6 hours per week maximum. Preliminary study also found that there were some VHS in East Java who implied entrepreneurship course as subject and extracurricular, but the interface hours is 6 hours per week. This study objectives

were to 1) compare the learning outcomes between students in entrepreneurship class (A) and regular class (B); 2) analyze the effect of learning outcomes on their entrepreneurship motivation.

## **2. Literature Review**

### **2.1. Entrepreneurship education in vocational education system**

Entrepreneurship education happened caused by few academicians and practitioners who argued that integrating of entrepreneurial programs into the educational system in high schools is a prerequisite to develop the necessary skills to start and run successful future businesses (Kroon, De Klerk, & Dippenaar, 2003; White, 2006).

The substance of curriculum-based entrepreneurship program in the VHS is entrepreneurial in character formation of students, including curiosity, exibility of thinking, creativity and ability to innovate (Hasanah, 2011). However, a study conducted by Winarno (2016) at 18 VHSs in East Java Indonesia, it showed that more entrepreneurial teachers teach "the theory of entrepreneurship" than forming values and skills, related curriculum in 2013 (K-13). It also showed that teacher only implement a learning model by giving the module containing the business motivations of character-based and case studies which structured through the guidance of teachers.

Ministry of National Education argues that the objectives of entrepreneurship education program in school are to: (1) strengthen the implementation of the existing curriculum (KTSP) in each education unit starting from early age education up to high school and Informal Education (PNF) by strengthening learning method and integrating entrepreneurship subject, (2) reviewing content standards, graduate competency standards, curriculum start from early age education up to high school and informal education in the context of mapping graduates' competencies related to entrepreneurship learning, (3) formulating entrepreneurship education plans in each unit of early age education up to senior high school and informal education.

Therefore, more specifically, research is needed which can provide empirical evidence generalization of the concepts of entrepreneurship education, productive competence, and learning in school production units in the setting of learning organizations (standard content and process standards) in the apparel expertise program in VHS. Chi-Kim Cheung and Eric Au (Journal of Entrepreneurship Education, 2010) case study showed that more students have planned to start up their own business after graduation if they find difficulty to find the proper job. It



was also found that many more students are willing to open their own business after they finish entrepreneurship practice. Within their mind, entrepreneurship is teachable, and it shall be kept in this way. Integrating some entrepreneurship elements into high school curriculum, thus, shall give them meaningful benefits. After completing entrepreneurship activities, many more students agree that entrepreneurship must be given to them as a comprehensive subject or lesson.

## **2.2. Integrated entrepreneurship course through VHS curriculum in fashion major**

Fashion design profession is a major closely following the development of the times, must be through the integration of innovation and entrepreneurship education to improve the quality of talents (Tian and Zhang, 2016). They also argued that entrepreneurial project-oriented is necessary to encourage students to go to the process of entrepreneurial practice, make them feel the whole business process with heart, summing up their own entrepreneurial experience to further enhance their entrepreneurial ability. The entrepreneurship education that is integrated will bring many positive impact on student's skill as it is considered in global marketplace. In association with that, Faerm (2012) stated that fashion designers must become increasingly educated in the nuances of the expanding global markets, sub-cultures, available resources, and technologies. Therefore, the emerging curriculum for vocational education applied has a general purpose in entrepreneurship education application. The entrepreneur subject matter consists of some aspects, such as: (a) entrepreneur attitude and behavior, (2) leadership and successful, (3) problem solving, and (4) decision maker (PP No. 24, 2006).

## **2.3. Factors that contribute in student learning outcomes in entrepreneurship education**

Theoretically, the learning outcomes of entrepreneurship subjects, productive training, and entrepreneurship motivation are variables that can be used to improve the learning success in school. Factors that drive actions toward entrepreneurship are not only the individuality of educated participants, but also environment where educated participants belong to. In this research, the environment is entrepreneurship class in VHSs. So far, this consideration is consistent with De Faiote (2003) who examined the effectiveness of entrepreneurship training & education program. De Faiote had made some findings, such as: (1) entrepreneurship training & education program shall be improved as the effective method to create entrepreneurs; (2) the program is helpful to generate enthusiasm toward entrepreneurship activities; (3) the program can minimize failure possibility among small businesses; (4) the program provides a relevant

entrepreneurship model for academicians, practitioners, and government; and (5) the program has been consistent to experts' suggestions. More specifically, this research provides empirical evidences about generalization of entrepreneurship education concept by taking background from the learning organization (content and process standards) of fashion study program at VHS.

Developed and developing countries show different findings about entrepreneurship learning outcomes. Prashanth N. Bharadwaj et.al. (Journal of Entrepreneurship Education, 2010) described that many stated in America have launched a training program for entrepreneurship called Self Employment Assistance (SEA). This program was once implemented in one university in Pennsylvania. The process involved giving entrepreneurship training to almost 400 individuals in period between 1998 and 2008. Based on Pennsylvania criteria, SEA program was successful. An approach called Quality Function Deployment or also named House of Quality was used to assess whether SEA program is indeed successful or not based on client or participant perspective. According to Mulyasa (2009), the learning outcomes is an overall student learning achievement which becomes basic competence indicator and an overall behavior change degree cornered with students. Thus, it can be concluded that learning outcomes is an overall behavior change, not only one of the human potential aspect only.

According to entrepreneurial experts, there are lots of entrepreneurial values that should be possessed by students and other school residents. However, in the development of the academic manuscript model, there were 17 selected entrepreneurial values that are considered to be the most suitable and in accordance with the level of students development. But in this study, the author only uses only 6 entrepreneurship values out of 17, which used as indicators in assessing entrepreneurship learning outcomes, namely: (1) honesty, (2) independent, (3) creative, (4) risk-taking (5) action-oriented, and (6) leadership.

#### **2.4. Factors that contribute in student entrepreneurial motivation**

Entrepreneurial motivation, according to Handoko (1998: 52) "a situation in the person who encourages the individual to carry out certain activities in order to achieve his business goals. In every effort that someone does is done based on the capital and ability of themselves, able to take or face the risk of trying, and efforts can be an example for others. Then, trust in one's own abilities is an important factor in achieving the success of his business, and every success obtained will strengthen his self-confidence. Lang and Liu (2019) reported factors that commonly motivate student to be fashion entrepreneurs, namely: having more freedom, passion for fashion, sense of achievement and financial independent. The

student's motivation to entrepreneurship is also encouraged by school teachers and schools that provide entrepreneurial subjects. (Saptono et al, 2018). As Alma (2011) said that for the learning materials are packed as attractive as possible to cultivate the interest of entrepreneurship students. This happened to MIT alumni, Harvard University and other colleges.

The success of entrepreneurs in improving their business performance in the sense of increasing business growth in the field of entrepreneurship lies in the extent to which entrepreneurial motivation motivates their business. The higher entrepreneurial motivation will further support the business performance achieved (Stephan, Hart, Mickiewicz, & Drews, 2015). Entrepreneurs, who have the high entrepreneurial motivation, means having the willingness to succeed in entrepreneurship. Therefore, McClelland explained that entrepreneurial motivation must be supported by achievement motivation, motivation to be in power, and affiliated motivation. Entrepreneurship motivation in this study was a motivation that is found in students which associated with better behavioral changes in achieving predetermined goals (learning outcomes), namely: achievement, recognition, responsibilities, the work itself, and advancement.

### **3. Method**

#### **3.1. Research design**

This study used quantitative approach with correlational design. It began with investigation on entrepreneurship subject learning outcomes as an independent variable and motivation as dependent variable. Learning approach used in this research is one based on production practices in industry. This learning approach emphasizes on business practices / entrepreneurship (training) given in entrepreneurial class, which therefore this model applies learning that involves students directly in the production of goods or services (class A) and practices that are carried out regularly (class B).

#### **3.2. Participant**

Research population included 65 VHSs in East Java and sampling technique was proportional stratified random sampling. Sample size was determined with Slovin Equation at imprecision level of 20%, and the result was a sample of 16 VHSs. One class of second grade was randomly selected from each school. Twenty students were drawn from the class, which therefore, total sample obtained would be 320 students.

### **3.3. Data Collection and Research's Instrument**

Data type was primary data collected using 4-scale Likert questionnaire, which had two main sections. First section was the instrument to measure entrepreneurship subject learning outcomes consisted 21 items derived from 6 indicators, namely, honesty, independence, creativity, risk-taker, action-oriented, and leadership. Second section was the instrument to measure entrepreneurship motivation consisted 16 items derived from 5 indicators, namely, achievement, recognition, responsibility, the work itself, and advancement. Data collection was done only once in a time when researcher team met directly with respondents on certain schedule provided by school. Such direct collection of data was aimed to reduce perception bias among respondents when they answered question items in questionnaire.

### **3.4. Trial study of the instrument**

Data were collected with questionnaire that students must fill in based on what they observed and experienced. The questionnaire consisted of indicators for each variable. Before collecting the main data, try out was done on 30 students in one VHS beyond 16 predetermined schools. Question items concerning variables were selected using exploratory factor analysis (EFA). Result of try out showed that research variables have good test reliability indicated by Cronbach Alpha coefficient  $> 0.60$ , composite reliability  $> 0.70$  and the average variant extracted (AVE)  $> 0.50$ . Item validity of variables was valid because it met factor loading requirement that should be more than 0.50.

### **3.5. Data Analysis**

Learning outcomes and its effect on motivation has analyzed used ANCOVA, a technique that is typically used to adjust or control for differences between the groups based on another, typically interval level, variable called the covariate (Leech et al, 2005). In this study, ANCOVA was used to differ entrepreneurship motivation between class A and class B and also used to analyze the effect on entrepreneurship learning outcomes toward entrepreneurship motivation.

### **3.6. Hypothesis**

The hypotheses in this study was connected several variables, namely: entrepreneurial learning classes, entrepreneurial learning outcomes and entrepreneurial motivation. The hypothesis was there is an effect of entrepreneurial

learning course and learning outcomes on entrepreneurial motivation. As it is presented in Fig. 1

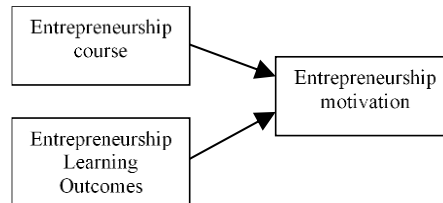


Figure 1. Hypothesis model

## 4. Results And Discussion

### 4.1. Entrepreneurship learning outcomes

There were six indicators to describe entrepreneurship subject learning outcomes, namely: honesty, independence, creativity, risk taker, action oriented and leadership. The descriptive statistic is showed in Table 1.

Table 1. Descriptive statistic of entrepreneurship subject learning outcomes

<b>A class</b>	Min	Max	Mean
<b>Variable</b>			
Entrepreneurship subject learning outcomes	2.61	3.88	3.32
<b>Indicator</b>			
Honesty	2.33	4	3.25
Independence	2.50	4	3.28
Creativity	2.25	4	3.33
Risk taker	2	4	3.39
Action oriented	2.25	4	3.45
Leadership	2	4	3.23
<b>B class</b>	Min	Max	Mean
<b>Variable</b>			
Entrepreneurship subject learning outcomes	2.29	3.83	3.11
<b>Indicator</b>			
Honesty	1.67	4	2.99
Independence	2	4	3
Creativity	2	4	3.18
Risk taker	2	4	3.11
Action oriented	2.25	4	3.3
Leadership	2	4	3.08

According to descriptive analysis result, entrepreneurship subject learning outcomes of every student in class A and B both can be categorized as good. The

average value of more than 3 illustrates that there is a high tendency that students can take lessons well. The indicator that support entrepreneurship subject implementation success both in class A and B lays in action oriented, creativity and risk taker. While, the indicator that is not support entrepreneurship subject to be success in its implementation both in class A and B were honesty, leadership and independence. Generally, all of student as the respondent has sensed the applied entrepreneurship subject learning outcomes in school. Data of entrepreneurship subject learning outcomes distributed in Figure. 2

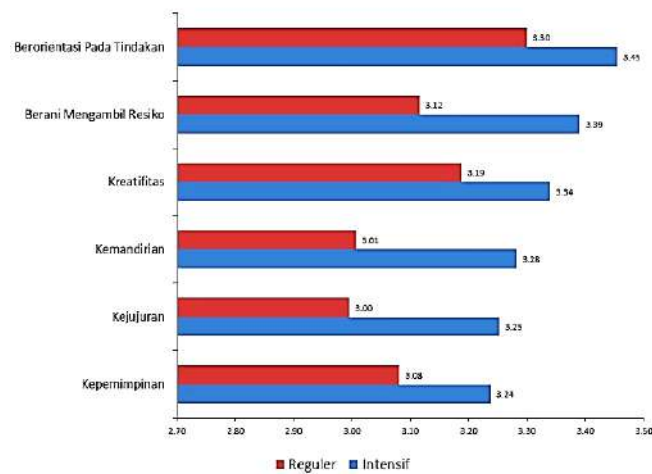


Figure 2. Histogram of entrepreneurship subject learning outcomes score

Based on figure 1, Class A (intensive class) has better score in every indicator than class B (regular class). This means most of students in class A, take the entrepreneur lesson well. Compared with other indicators in entrepreneurship material, honesty, leadership and independence of the students still needs to be improved. The findings in this study also prove that honesty indicators as part of entrepreneurship subjects lead to education for students to have behaviors that are based on efforts to make themselves always trustworthy in words, actions, and jobs.

On the notion of risk-taking, students in this study showed a surprising reluctance to accept the risks and uncertainties associated with running their own business. Interestingly, the willingness to take risks is usually considered one of the important characteristics of an entrepreneur (McClelland, 1961; Timmons, 1990; Koh, 1996)

Honesty can be related to the recognition of original work from students which is not only the result of copying the work of other people. This is very important to be accustomed to students, given the competency / academic

achievement that becomes capital in fostering confidence in entrepreneurship or readiness to enter the workforce. As it is stated by Cheung (2010) that globalization has also posed serious challenges for the workforce.

Futhermore, entrepreneurship and leadership are inseparable (Cheung, 2010). The entrepreneurial world that SMK students will enter cannot ignore the aspect of leadership. Leadership in vocational students can be improved by designing and implementing cooperative learning models, with this approach will greatly help the formation of stronger aspects of leadership, because the syntax of cooperative learning models requires students to study in groups, then students in groups will choose group leaders to lead learning activities in the group.

The distribution of students' mean score less than 3 for entrepreneurship subject learning outcomes is 12.8%. Based on this percentage, there are 87.2% students who can follow entrepreneurship learning process favorably. This description proves that all students of fashion skill program at VHSs in East Java have been able to follow properly entrepreneurship subject at their school. It can be said that entrepreneurship subject learning outcomes at school has been in good category.

#### 4.2. Entrepreneurship motivation

There were 5 indicators in entrepreneurship motivation with consist of 2-4 items for each of them. Therefore, there were 16 items to rate each indicator and several attributes in entrepreneurship motivation. The descriptive statistic is showed in Table 2.

Table 2. Descriptive statistic of entrepreneurship

<b>A class</b>	Min	Max	Mean
<b>Variable</b>			
Entrepreneurship motivation	2.68	4	3.43
<b>Indicator</b>			
Achievement	2.33	4	3.63
Recognition	2.33	4	3.54
Responsibility	2.5	4	3.38
The work it self	2	4	3.06
Advancement	2.5	4	3.53
<b>B class</b>	Min	Max	Mean
<b>Variable</b>			
Entrepreneurship motivation	2.4	4	3.23
<b>Indicator</b>			
Achievement	2.33	4	3.48
Recognition	2.33	4	3.28

Responsibility	2.25	4	3.17
The work it self	1	4	2.86
Advancement	2.25	4	3.36

was a motivation that is found in students in a form of courage to changes into better behavior in achieving predetermined goals (learning outcomess) namely: achievement, recognition, responsibilities, the work itself, and advancement. The average value of more than 3 illustrates that there is a high tendency that students have high entrepreneurship motivation.

The level of entrepreneurship motivation according to Table. 2 above can be conclude that low motivation level lays on the work itself and responsibilities indicator. High motivation level lays on recoqnition, advencement and achievement. Data of entrepreneurship motivation score distributed in Figure. 3

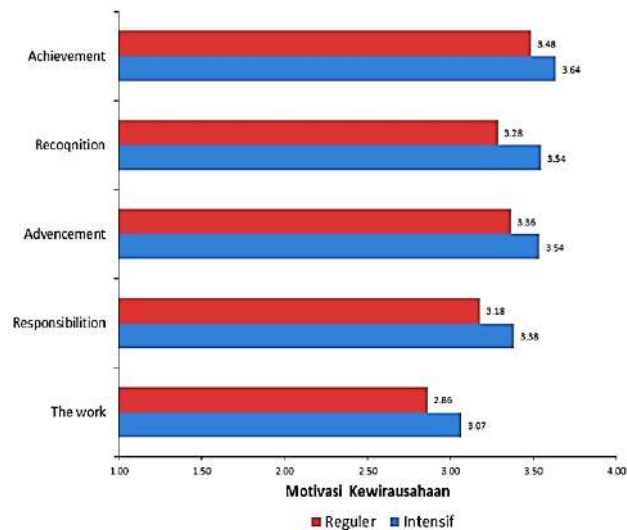


Figure 3. Histogram of entrepreneurship motivation score

Based on figure 2, Class A (intensive class) has better score in every indicator than class B (regular class). This description explains that the observed students have strong motivation to enter the business world. Cheung (2010) stated that if students are to be taught about entrepreneurship, the best way of doing so is to give them the experience of being entrepreneurs themselves. After students were given the experience of running a small business, they understood better how real businesses worked, and this would give them more confidence if they had to start a business in future.



As known, that, in this study, student in A class were spent more time in produce an run their own business than sitting in class. Therefore, they could have more experience in business practice. The study conducted by Cheung (2010) shows that The SBA (Small business activity) had a positive impact on the students' desire to become entrepreneurs. More students (57%) considered starting up a business after taking part in the SBA than before (50.6%).

This study proved that the indicators of achievement (accomplishments achieved / success) and recognition included two things that were perceived positively by vocational students in the apparel expertise program. The vocational discipline they pursue motivates them to be more confident that competent vocational study choices will be able to compete and gain recognition.

The achievement and recognition can stimulate student's self-awareness then effect their entrepreneurship motivation. Assudani and Kilbourne (2015) emphasize the importance of students' self-awareness in entrepreneurship education and even strongly recommend a pedagogical shift from a technical-functional approach to a conversational, dialogical approach to stimulate students to critically analyze and develop their self-awareness. As stated by Yamin (2011) that the motivation for entrepreneurship is an effort to achieve success, which aims to succeed in competition by referring to a certain measure of excellence.

The distribution of students' mean score less than 3 for entrepreneurship motivation is 26.3%. Regarding to this percentage, there will be 73.7% students who have high motivation toward entrepreneurship.

The effect on entrepreneurship subject learning outcomes towards entrepreneurship motivation analization

Furthermore, the results of the test for differences in entrepreneurship motivation between intensive and regular classes are explained in Table 3. Based on ANCOVA results with entrepreneurship subject as a covariate variable, it was explained that there was no significant difference ( $p > 0.05$ ) in entrepreneurship motivation in both classes.

Table 3. Analysis of Covariance (ANCOVA) of entrepreneurship motivation

Variations	Square	Freedom level	Median	Square	F	p
Entreprene-urship subject		14.744	1	14.744	341.3400	0.000
Class	0.116	1	0.116	2.681		0.103
Error	13.693	317				0.043

Total	31.603	319
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This study showed that there is no difference in entrepreneurship motivation in the class that comes from class differences (A and B) ( $F = 2.681$ ;  $p = 0.103$ ). This can be happen due to the same condition that is controlled by the researcher, namely: curriculum, the subject that is given, the number of students for each class in every school, and also the number of schools which chosen as the sample in this study.

The growth of interest and motivation in entrepreneurship also needs to be instilled early in the child. One of the most effective places to foster entrepreneurship interest is through education. According to researcher, entrepreneurship education will be able to generate a large national impact if this entrepreneurship education can generate four million new entrepreneurs over the next 25 years (Of & Japanese, 2012).

This study also proved that there is a significant effect of entrepreneurship subject learning outcomes towards entrepreneurial motivation ( $F = 341,340$ ;  $p = 0,000$ ). As showed in Table 2, entrepreneurship motivation in the intensive class (3.53) has a higher average than the regular class (3.36). This can be effect student's motivation in entrepreneurship because as Cheung (2010) stated that in a traditional classroom, a good student's job is to sit quietly and listen attentively to the teacher. Each student is treated as an isolated individual who studies alone. They are given little chance to work and cooperate with other classmates in learning activities. Intensive class got a lot of chance to work and cooperate with other classmates and this relation run well. This occur because group discussion in learning will be able to foster an attitude of confidence and cooperation.

## 5. Conclusion And Recommendation

The findings of this study showed that class A's students has better learning outcomes than class B's student, both classes's learning outcomes were supported by creative, risk-taker and action oriented indicator, but honesty, leadership and independence were the indicator that did not support. In the case of entrepreneurship motivation, class A student's has higher motivation than class B's student, both classes's motivation supported by recoqnition, advancement and achievement indicator, but work itself and responsibilities were the indicator that did not support.

This study also proved that there is a significant effect on entrepreneurship subject learning outcomes towards entrepreneurial motivation. Eventough there is no differences in entrepreneurial motivation in the class that comes from class

differences (A and B). The result in this study can be a recommendation for government (education authorities) policy, in vocational high school practice learning implementation.

## 6. Acknowledgement

The authors wish to express their gratitude to the Rector Prof. Dr. Nurhasan, M.Kes, The first Vice of Rector of UNESA, Prof. Dr. Bambang Yuliyanto, M.Pd, who have supported this research in giving an opportunity to join professor acceleration and its funding; the Dean of Engineering Faculty UNESA Dr. Maspiyah, M.Kes, who has given her support and giving an opportunity to join professor acceleration; Prof. Dr. John Vong, Dr. Jeff Fang, Dr. Duong as the instructor in this workshop; Resta and Basith Pahlevi who has helped in communication and administration of this workshop; and all of the participants in the professor acceleration program who always support and share in each other.

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