



PROCEEDINGS OF THE  
**EDUCATION  
RESEARCH**  
*Colloquium*  
2018

BETWEEN  
FACULTY OF EDUCATION, UNIVERSITI TEKNOLOGI MALAYSIA (UTM)  
& UNIVERSITAS NEGERI MAKASSAR, INDONESIA



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA



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Faculty of Education,  
Universiti Teknologi Malaysia

Foreword by the  
Dean of Faculty of Education, UTM

*Assalamualaikum w.b.t and Good Day*

Ladies and gentlemen,



It is my pleasure to welcome you to the Education Research Colloquium between Faculty of Education, Universiti Teknologi Malaysia (UTM) & Universitas Negeri Makassar (UNM), Indonesia. This colloquium is a platform for both institutions to sustain a harmonious and stable global society and to promote international cooperation and exchange. As we know, UTM participated in a wide variety of collaborative relationships with universities, institutions and individuals in many countries. I am confident that through this colloquium, relationship and friendship between FP UTM and UNM will become stronger. I would like to take this

opportunity to congratulate all presenters in this colloquium. I am sure that the variety and depth of the research presented at this colloquium will be appreciated by the audiences. In summary, I believe that this colloquium is just a start for a more fruitful and continuous collaboration between FP UTM and UNM.

Thank you

A handwritten signature in black ink, appearing to be 'M. Sukri Saud'. The signature is fluid and cursive, written on a light-colored background.

**Professor Dr. Muhammad Sukri Saud**  
Dean  
Faculty of Education  
Universiti Teknologi Malaysia



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# Effect of Learning Styles on Student Learning Outcomes Course in Statics and Materials Mechanics Subject

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## Abstract:

This study aims to explain the effect of learning type on the student's learning achievement in Statics and Materials Mechanics Subject. This study is survey research, with a population of all students active odd semester 2017/2018 who follow the subjects at the Department of Civil Engineering and Planning Faculty of Engineering, Universitas Negeri Makassar. The sample size is 125 people with a significance level of 5%. The research variables are visual learning style (X1), auditory learning style (X2), kinesthetic learning style (X3) and learning the result of Statics and Material Mechanics Subject (Y). Techniques of data collection using questionnaires, interviews, and documentation. The results concluded that there was no significant influence of three kinds of learning style to the learning achievement.

**Keywords:** visual, auditory, kinesthetic and learning achievement.

## 1.0 Introduction

Vocational education as part of the national education system plays a very strategic role in the realization of skilled labor. Human resources with high knowledge and skills provide opportunities for the economic growth of a region. Reliable workers can adjust to the dynamics of technological development. Human resources must also have the ability to produce products with quality and price, the ability to compete with products in the global market.

Teachers play an essential role in teaching and learning. Furthermore, the teachers should be able to adapt and adapt their teaching methods to the child's developmental level. Teaching and learning activities do not lie with teachers but how students should also be actively involved in teaching and learning (Hawk & Shah, 2007). Teacher teaching style that adapts to the characteristics of learners shows teachers' perseverance in helping learners achieve learning mastery (Allcock & Hulme, 2010). Although teaching styles of teacher varied from one to another, at the learning process, all teachers have the same goal. A fun teaching style has an impact on improving students' motivation and motivation to learn a subject. Teachers motivate to learn by giving aspirations to students get the expected results. The higher the motivation, the intensity of effort and the effort made to achieve the desired learning achievement will also be higher (Duncan & McKeachie, 2005).

A learning method as delivering knowledge often take different ways. Some students prefer to read the matter from the board, while some students were easy to understand the subject by listening to the verbal information. This is because learners often take different ways to understand original information or lesson (Grainger & Barnes, 2006). Although the lecture method looks conventional, there are still many students who love the learning model that puts the teacher as a speaker. Teachers are expected to tell at length about various

theories with various illustrations, while students listen while describing the content of the lecture in the form of their imagination (Busato, Prins, Elshout, & Hamaker, 2000).

The difference in learning style shows the fastest and best way for every individual to absorb outside information. A person's ability to understand and absorb the lessons is different (Li, Medwell, Wray, Wang, & Xiaojing, 2016). Consequently, a teacher must be able to understand how the different styles of learning students and try to make students aware of the difference. Thus, it is easier for teachers to convey information more effectively and efficiently (DePorter, Reardon, & Singer-Nourie, 1999).

Learning outcomes are a direct result of behavior after going through the process of teaching and learning by the learning material. Individuals in learning have a variety of learning styles, there is student prefer to learn by way of visual (see), there is learning by auditorial (listening), and learning by kinesthetic (move). How to learn learners are diverse is called a learning style (Chania, Haviz, & Sasmita, 2017). Learning style is one crucial aspect in a way that individuals have in absorbing, organizing and processing information received. The appropriate learning style is the key to one's success in learning (Deporter & Hernacki, 2000).

The active learning, learning styles also affect the achievement of learning objectives. Lack of knowledge about learning style is one of the many obstacles faced by learners and educators in the learning process. Thus, it can be concluded that improving the quality of learning is very dependent on the learning style of learners, so by using an efficient learning style and fun, then learners can improve motivation and learning outcomes even though the material taught by educators is quite complicated for them (Gilakjani, 2011).

The results of initial observations in this study, in the curriculum of learning productive and non-productive courses especially on the subject of Statics and Materials Mechanics Subjects there are three learning styles used by students in learning are visual, auditorial and kinesthetic learning styles. However, students are more likely to use kinesthetic learning styles. Subject Statics and Materials Mechanics studied by students in the first semester which is seen from the data of the Department of Civil Engineering and Planning Faculty of Engineering, State University of Makassar students who program the subjects of Statics and Mechanics The material of learning outcomes is less good.

Student learning outcomes are evidenced by the value obtained when programming the subjects of Statics and Materials Mechanics for SI undergraduate programs 2014, 2015 and 2016 which scored poor (E) of 30%. The low learning outcomes of students are caused by various factors, both internal factors and external factors that influence learning outcomes. One of the characteristics of learners that influences the learning outcomes is the learning style. Learning styles with learning outcomes Statics and Mechanics Materials selected as variables to be studied.

## **2.0 Research Method**

This research is survey research. The population in this study is all students active odd semester 2017/2018 as the participants of the Statics and Materials Mechanics Subject at the Department of Civil Engineering and Planning Faculty of Engineering, Universitas Negeri Makassar as many as 175 students. Determination of the number of samples used Harry King

nomogram with 5% significance level so that the number of samples as many as 125 respondents. Sampling using proportional random sampling.

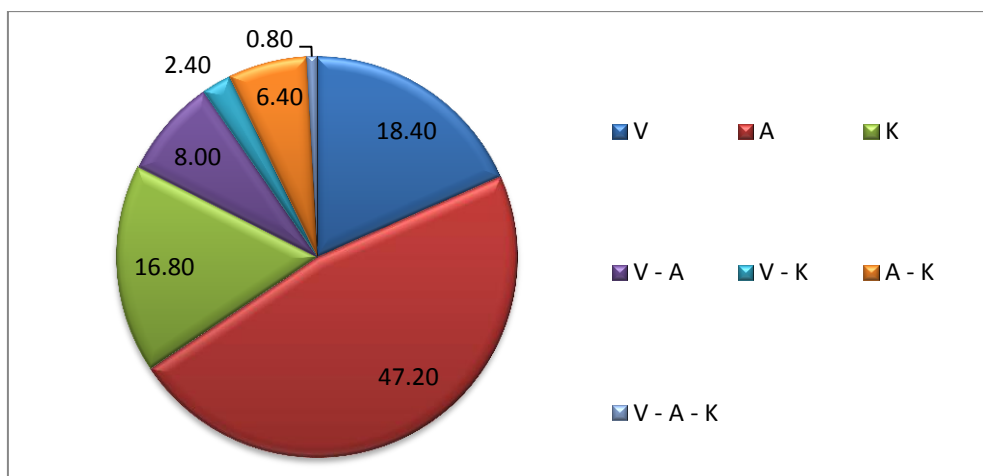
The research variables are visual learning style (X1), auditory learning style (X2), kinesthetic learning style (X3) and learning result (Y). Techniques of data collection using questionnaires, interviews, and documentation. The questionnaire used using a Likert scale. The collected data is further interpreted using descriptive analysis and inferential analysis with the help of SPSS 16.0 program.

### 3.0 Result and Discussion

Student learning styles are determined by the number of scores obtained from each questionnaire of shared learning styles. Each learning style consists of 7 statements. The highest score of each style statement indicates the learning style of the respondent.

#### 3.1 Description of Learning Style

The results showed that respondents not only have one dominant learning style, but also some respondents have two learning styles, there is even a respondent who can optimize the three learning styles.



**Figure 1:** Percentage of Student Learning Styles on Statics and Materials Mechanics

Figure 1 shows that students who program static subjects and dominant material mechanics have auditory learning types (47.20%). Also, there are also respondents who have more than one learning style, even 0.80% of respondents who have all three learning styles. Visual and auditory learning style as much as 8%, auditory and kinesthetic as much as 6.40%, and there are 2.40% students has Visual and Kinesthetic learning styles.

Table 1 shows that male respondents dominantly have learning type of auditory, while female respondents tend to have visual learning styles and kinesthetic, even respondents who can optimize the three learning styles are women. Ames (2003) revealed that there is a difference in the dominance of learning styles of students. The learning styles associated with the student gender. Furthermore, the teacher should desire the student interest to encourage their motivation.

**Table 1:** Description of the distribution of student learning types by gender

Learning Style	Men (%)	Women (%)	Total
Visual	39.13	60.87	100.00
Auditory	64.41	35.59	100.00
Kinestetik	19.05	80.95	100.00
Visual - Auditory	30.00	70.00	100.00
Visual – Kinesthetic	33.33	66.67	100.00
Auditory - Kinesthetic	62.50	37.50	100.00
Visual – Auditory – Kinesthetic	0.00	100.00	100.00

Slater, Lujan, & DiCarlo (2007) revealed that there is no significant difference to the presentation of information. Although not significantly different, the female student population tended to be more diverse than the male population, which included a combination of broader sensory in their preference profiles. Therefore, instructors need to be aware of these differences and extend the range of their presentation styles.

Other studies have shown that there is a difference between the preferred learning methods by female and male students, mathematical achievement, and their attitudes toward mathematics. Achievements and attitudes toward mathematics subjects are not dependent on gender. Female students most like Convergent learning styles, while most male students love the Assimilator learning style. However, none of the students chose the Accommodator learning style in both groups. (Orhun, 2007)

### 3.2 Learning Achievement Description

The result of the respondent's learning is obtained from the result of study result document from the head of the study program. The complete will be described as follows:

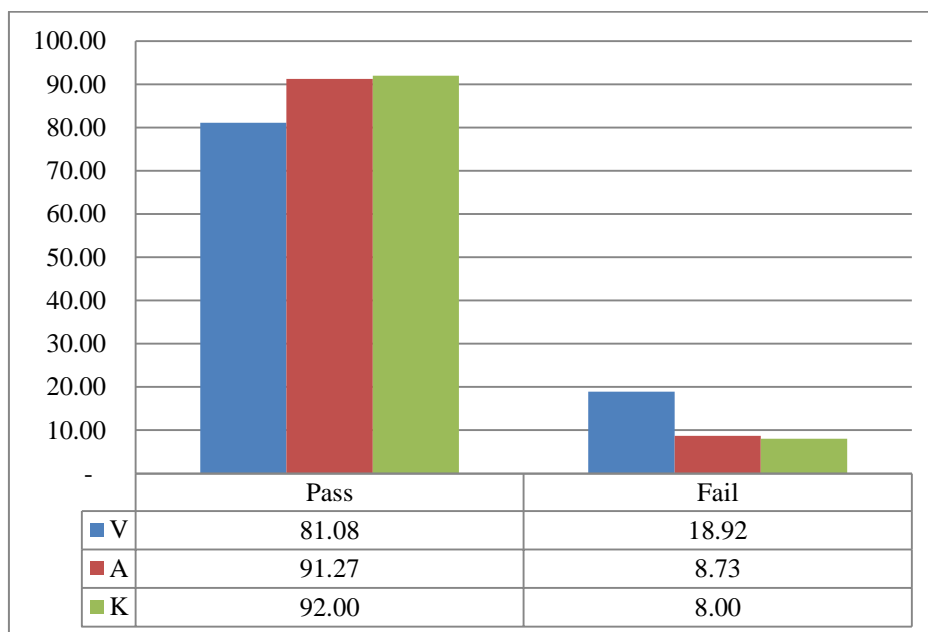
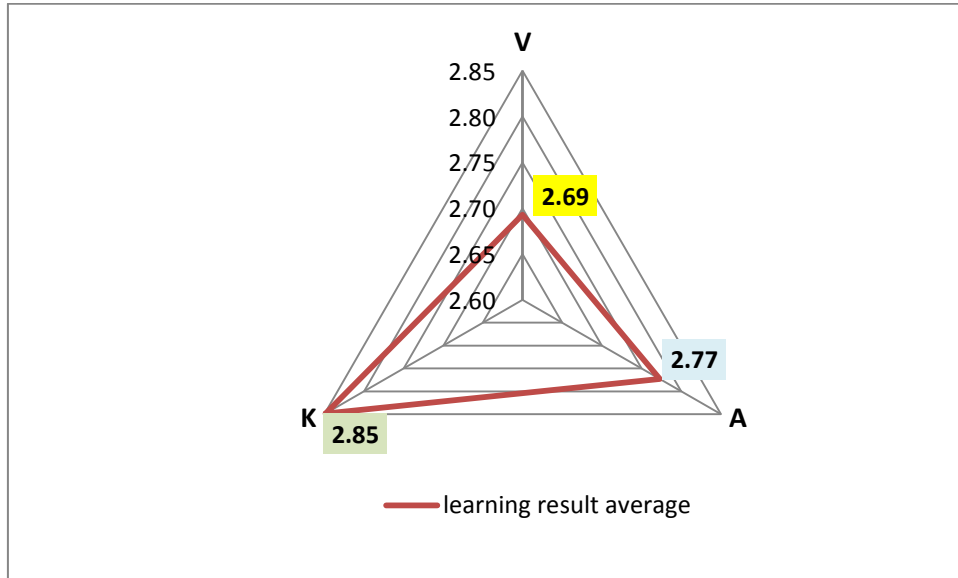
**Figure 2:** Student's Mastery Learning on Statika dan Material Mechanic Course

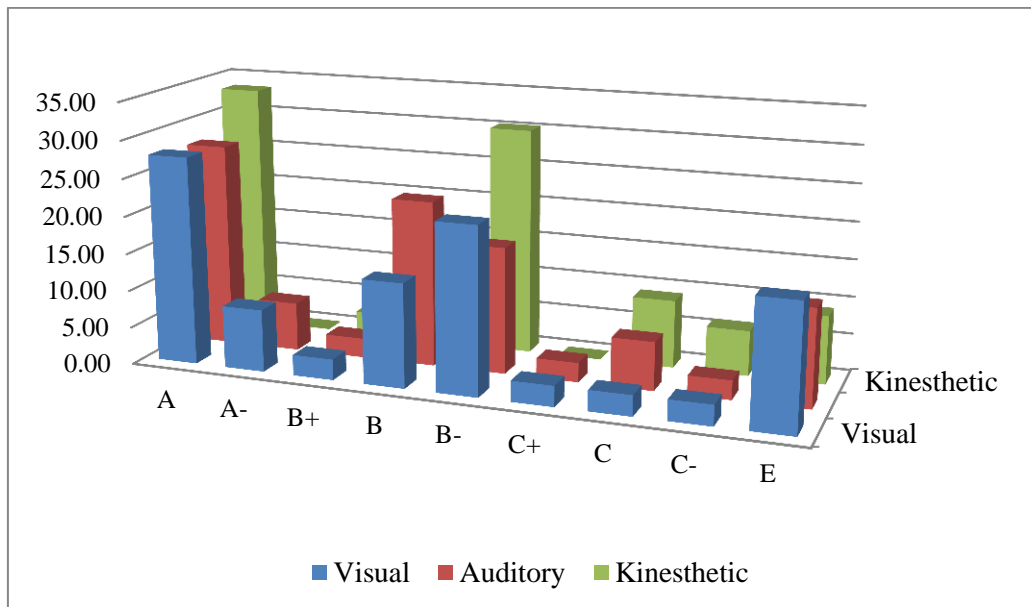


Figure 2 shows that respondents who have visual learning styles are fewer passes when compared to other learning styles, while students with kinesthetic learning styles have a graduation rate of 92%. The subjects of statics and materials mechanics focus on reasoning and load analysis. This emphasizes on the optimization of the ability to see and hear the explanation of lecturers so that the material can be understood well. When the visual and auditory learning styles are optimized, then the student graduation rate can be higher.



**Figure 3:** Student's Grade Performance Achievement Vs. Learning Style of Students

Figure 3 presented data that the average learning outcomes of respondents with Kinesthetic learning style is higher than others, while the lowest learning outcomes are in respondents who have a Visual learning style.



**Figure 4:** Student's Learning Result

The values of "C-" and "E" are grades not graduated in the subject. Figure 4 shows the distribution of respondents' values based on their learning styles. From the graph, it can be

seen that kinesthetic learning style is more in the value of "A," "B-," and "C." Also, at the value of "C-" kinesthetic learning style is also more. Visual learning styles and auditory learning styles spread almost all levels of assessment, but the visual learning style has the greatest percentage of the "E" score which is one of the grades not graduating in the static course.

### 3.3 Hypothesis testing

Hypothesis test resulted in the relationship between student learning style (X) with learning result (Y) with the help of SPSS (Statistical Package for the Social Sciences) 16.0 for windows program. Before performing hypothesis testing, the research data must satisfy the requirements analysis test. The results of the requirements analysis test are presented in Table 2.

**Table 2:** Test requirements analysis of learning types

Variables	Probability ( $\rho$ )		
	Normality	Linearity	Homogeneity
Visual	.184	.240	.201
Auditory	.138	.061	.492
Kinestetik	.426	.798	.961

Testing of data normality with probability value ( $\rho$ ) for Visual learning type is higher than significance value 0.05. Thus, it can be concluded that all data is normally distributed. In linearity test, it can be seen that all the test results of variables of Visual, Auditory, and Kinesthetic learning type of linear on student learning outcomes. The significance level was less than the probability value. While homogeneity testing shows that the probability value ( $\rho$ ) is higher than the significance value 0.05. The variable data type learning Visual, Auditory, and Kinesthetic was homogenous.

Hypothesis testing was done using inferential analysis using simple regression. The effect of one independent variable on the dependent variable. The criterion used is based on probability value. Also, the decision making can also be done by comparing the  $t_{count}$  value with the  $t_{table}$ . The result of simple linear regression analysis of the independent variable to the dependent variable is presented in Table 3.

**Table 3:** Simple Regression Analysis

No.	Variable	r-parsial	Contribution (%)	$T_{count}$	$\rho$	N	$t_{table}$
1	$X_1 \rightarrow Y_1$	0.475	22.60	1.938	0.061	36	2.032
2	$X_2 \rightarrow Y_2$	0.258	6.60	0.079	0.937	77	1.992
3	$X_3 \rightarrow Y_3$	0.136	1.90	1.009	0.321	33	2.039

Based on Table 3, it can be explained that the correlation coefficient of variable visual learning type ( $X_1$ ) was 0.475 marked positive, probability value  $0.061 > 0.05$  while  $t_{count}$   $1,938 < t_{table}$  2.032. The result indicated that the variable type visual learning does not give positive effect to variable student achievement.

The correlation coefficient of variable of auditorial learning type (X2) was 0,258 with positive sign, probability value was  $0.937 > 0.05$ , while  $t_{\text{count}} 0.079 < t_{\text{table}} 1.992$ . The result indicated that variable of the type of auditorial study did not have a positive influence on student achievement variable.

The correlation coefficient of kinesthetic learning variable type (X3) was 0.136 positive sign, probability value  $0.321 > 0.05$ , while  $t_{\text{count}} 1.009 < t_{\text{table}} 2.039$ . The meaning of analysis that kinesthetic learning type variable does not give positive effect to student achievement variable.

These results indicate that the three learning styles namely visual, auditory, and kinesthetic do not give influence to student achievement. This is different from the results of research (Gilakjani, 2011) which explains that the improvement of learning quality is very dependent on the learning style of learners, so by using an effective learning style and fun, then learners can improve motivation and learning outcomes, although materials taught by educators quite complicated for them.

#### 4.0 Conclusion

Based on the results of the analysis, the conclusion of the research was:

1. Student learning style in Statics and Material Mechanics dominantly have type learning Auditory. Also, there were also respondents who have more than one learning style. The dominant male respondents have to learn Auditory, while female respondents tend to have visual learning styles and kinesthetic
2. Visual learning styles are fewer passes when compared to other learning styles, while students with kinesthetic learning styles have a graduation rate of 92%.
3. Visual, auditory, and kinesthetic learning styles do not affect student achievement.

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# The Knowledge of Farmers about Local Potentials of Fertilizer and Pesticides Organic in Wajo, South Sulawesi Indonesia

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## Abstract:

The farmer's habits in excessively using chemical fertilizers and pesticides can reduce the level of soil fertility and environmental pollution. The farmers prefer to use chemical fertilizers and pesticides instead of the organic. This study aims to obtain a description of the level of knowledge of farmers in using fertilizers and pesticides and farmer's knowledge about the local potential of organic fertilizers and pesticides in Wajo District. The research used quantitative descriptive and involved 100 farmers selected by proportional area random sampling method. Technique of collecting data by using questioner. The results showed that the level of knowledge of farmers about the using of chemical fertilizers and pesticides was high. While, the knowledge of organic ones was low category. Furthermore, farmers' knowledge about local potency of fertilizer and vegetable pesticide is still low. Therefore, the results of this study became the basis for the development of environmental education for farmers in the utilization of local materials as fertilizers and vegetable pesticides

**Keynote:** Knowledge, chemical, organic, fertilizer and pesticide

## 1.0 Introduction

The increasing population has implications to the growth of food product needs. Consequently, agricultural activities require high and sustainable food production rates. Therefore, farmers apply various technologies that require synthetic chemical input production to optimize agricultural product. The using of fertilizers and pesticides allows farmers to increase the productivity of agricultural land and even able to protect farmers from post-harvest losses.

The application fertilizer aims to supply various nutrients needed by plants. While the pesticides has advantage to reduce and control the population of plant disturbing organisms. So far, farmers prefer to use chemical fertilizers and pesticides instead of organic materials. The reason for this practice is the practicality and the relatively cheap price. However, the habits of farmers using chemical fertilizers and pesticides in excess will reduce the level of soil fertility and environmental pollution. Continuous application of pesticides actually leads to pollution on farmland. High-dose synthetic chemical inputs on soils can threaten biodiversity and increase pest, disease and weed attacks. The using of insecticides and fungicides has a consistent negative effect on biodiversity, the use of insecticides also reduces the potential for biological control (Geiger et al., 2010).

There are many research about the negative impact or risk caused by pollution of agricultural products. The chemicals fertilizer has the risk to the human health. The of insecticides and fungicides has a consistent negative effect on biodiversity, the use of

insecticides also reduces the potential for biological pest control (Geiger et al., 2010). Therefore, the use of organic materials as fertilizer and pesticides is a wise effort in maintaining the quality of human life.

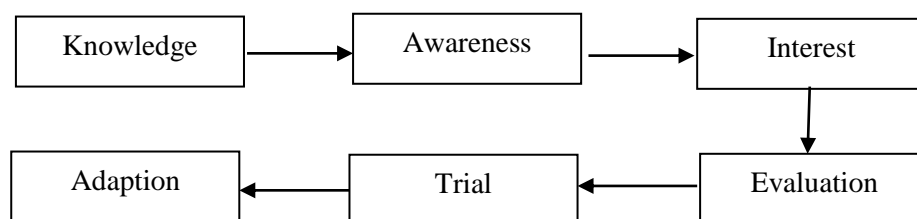
Natural resources that can be utilized as an organic pesticide and fertilizer sourced various types of plants, agricultural waste, household waste and waste from livestock products. As a megabiodiversity country, Indonesia has a huge diversity of flora. More than 400 thousand plant species have been identified chemicals and 10 thousand of them contain secondary metabolite potential as a raw material of vegetable pesticides. types of plants that belong to 235 families (Kardinan, 2011).

One potential pesticides source is the plant species of the Asteraceae family, Fabaceae and Euphorbiaceae. The secondary metabolic content present in plants is capable of controlling plant pest organisms. The secondary metabolite compounds of the plant can control the population of insect pests. The properties and working mechanisms of plant-based substances in the protection of plants can be as antifitopathogenic (agricultural antibiotics), phytotoxic or regulate plant growth (phytotoxins, hormones, and the like), and active ingredients to insects (insect hormones, pheromones, antifidants, repellents, attractants, insecticide). (Sastrosiswojo, 2002).

## 2.0 Theoretical Review

### 2.1 Knowledge

Knowledge is a very important domain in stimulating the formation of one's actions. Knowledge of an object can be positive and negative. Both of these types will determine a person's attitude to action, the more positive aspects of a known object, the more positive the attitude towards a particular object will be. The process of behavior that comes from knowledge through six mechanisms. (Notoatmodjo, 2007).



**Figure 1:** Mechanism of human behavior (Kollmuss & Agyeman, 2002)

### 2.2 Fertilizer and Pesticides

Fertilizer is a material used to change the physical, chemical or biological properties of soil to be better for plant growth. In a special sense, fertilizer is a material containing one or more plant nutrients. (Rosmarkam & Yuwono, 2002). Fertilizer is the key to soil fertility because it contains one or more elements to replace the plant's exhausted elements. (Lingga, 2001). Fertilizer is defined as a material that is added to the ground or canopy of plants in order to complete the nutrient supply. (Novizan, 2002).

Pesticides are substances or chemical compounds, growth regulators and incentives, other substances, as well as micro-organisms or viruses used for plant protection; Pesticides

(English: Pesticide) derived from the word pest which means pest organisms (pests) and cide which means lethal or poison. So the pesticide is a poison used to kill pests. Pesticides are substances or chemical compounds, growth regulators and stimulants, other substances, as well as micro-organisms or viruses used for plant protection (Djojsumarto, 2000).

### 3.0 Research Method

The research type is quantitative descriptive to obtain a systematic description of the phenomena studied (Suharto, 1993). Sampling using the proportional area random sampling method, ie sampling based on the region where each sampled randomly sampled in 14 District in Wajo Regency. The number of samples in this study as many as 100 farmers with the assumption that the sampled data is homogeneous data. Technique of collecting data by using questionnaire. Data analysis technique using descriptive data analysis percentage.

- a. Good knowledge level when score > 75% - 100%
- b. Sufficient knowledge level if score 56% - 75%
- c. Knowledge level is less when score < 56%

### 4.0 Result

This variable is measured by indicators of knowledge of chemical fertilizers associated with the dosage of use, chemical content and its benefits and its negative impact on the environment. A description of farmers' knowledge level on fertilizers and pesticides is presented in Table 1.

**Tabel 1:** Level of Knowledge About the Use of Chemical Fertilizers and Pesticides

Category	Frequency	Percentage (%)
High	85	85
Medium	15	15
Low	0	0
Sum	100	100

Table 1 shows the level of knowledge of farmers about the use of chemical fertilizers and pesticides there are either category or as much as 85%, and knowledgeable enough as much as 15%. The level of knowledge of farmers is seen from the questionnaire that farmers know various types of chemical fertilizers and pesticides but do not know the dose of proper use of fertilizers. In general, most know the negative impact of the use of fertilizers and pesticides on soil and human life.

Knowledge of farmers about organic fertilizers and pesticides related to information obtained about the source, the way of processing and the method of application. Based on the respondent's answer, then described farmers knowledge in table 2.

**Tabel 2:** Level of Knowledge About Organic Fertilizers and Pesticides

Category	Frequency	Percentage (%)
High	13	13
Medium	39	36
Low	48	48
Sum	100	100

From table 2, it appears that farmers' knowledge about fertilizers and pesticides is in the less category. There are only 39% of farmers with sufficient knowledge. Furthermore there are 13% of farmers with high knowledge. Farmers' knowledge of local potential in the environment as an organic source of Fertilizers and Pesticides is presented in table 3.

**Tabel 3:** Farmers Knowledge Level About Local Potentials to Be Organic Fertilizers and Pesticides

Category	Frequency	Percentage (%)
High	0	0
Medium	23	23
Low	77	77
Sum	100	100

Table 3 above shows that as many as 77% of farmers have low knowledge and as many as 23% of farmers have sufficient knowledge about local potency types that can be used as organic fertilizers and pesticides and how to manage local potency into organic/vegetable fertilizers and pesticides.

## 5.0 Conclusion

Farmers' knowledge about the use of chemical fertilizers and pesticides is relatively high. This knowledge is related to dose and environmental impact. However, farmers' knowledge of the types and sources of organic fertilizers and pesticides is still low. Likewise with farmers' knowledge of local potential sources of organic and pesticides.

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# The Quality Analysis of Academic Services Based on Importance Performance Analysis (IPA)

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## Abstract:

The purpose of this study is to analyze the description of the quality of academic services by using the importance of performance analysis (IPA). The sample of research is 40 respondents from the National Informatics Polytechnic Student of Makassar. Quantitative data analysis techniques using Importance Performance Analysis (IPA). The results showed that the quality of service has given positive response / good that was seen from the services provided by employee/staffs and lecturers in providing student academic services. The weaknesses in the provision of services such as: the classroom learning facilities and campus attention to the talents and interests of students is still low, the limitations of references in the library and the campus funding transparency have not been yet opened.

**Keynote:** service quality, Importance Performance Analysis.

## 1.0 Introduction

Service is a fixed price in improving the performance of an organization (Hu, Lee, Yen, & Tsai, 2009). Therefore, one way to find out the quality of the service of an organization must be to use an accurate method within provide an assessment. As with the Impotence Performance Analysis (IPA) model is a kind of model that is developed to measure service quality (Martilla & James, 1977); (Berry & Parasuraman, 1992); (Breiter & Milman, 2006); (Angell, Heffernan, & Megicks, 2008); (Hu et al., 2009); (Kim & Lee, 2015); (Shafaei & Razak, 2016). The fundamental concept of the analysis, conducting analysis in the field of service quality of a profit organization. However, it does not rule out that in measuring the performance of academic service organizations should not be. Rather it is able to provide analysis and classify the quality of service. (Akib, Rifdan, & Guntur, 2015). Similarly, at the campus of the Politeknik Informatika Nasional Makassar.

Some efforts in organizing the service, at the Politeknik Informatika Nasional Makassar still experiencing various obstacles to improve the quality of service. One of the problems faced is the lack of educational staff when compared with the number of students enrolled in the campus.

## 2.0 Research Method

This type of research includes quantitative descriptive research. Location of research at Politeknik Informatika Nasional Makassar of Alaudin Branch. Respondents in this study were 40 students using multi stage sample ramdom. Technique of collecting data by using: 1)

observation, 2) questionnaire, and 3) interview. Data analysis technique using SPSS with Method Importance Performance Analysis (Martilla & James, 1977).

### 3.0 Result

Quality academic service is a fixed price in an institution. Because with a quality service, it will provide a good image for the institution. Similarly, in educational institutions, which create quality alumni and ready to work. Of course has a standard service both national and international levels.

In order to know the description of Quality of academic service picture quality of academic service at the Politeknik Informatika Nasional Makassar. The researcher will present a picture of academic service seen from five service aspects, namely; (1) tangible, (2) responsiveness, (3) assurance, (4) empathy, (5) reliability. Which of the five aspects of service consists of 28 attribute questions. The result findings of the Academic Service at Politeknik Informatika Nasional Makassar of Alaudin Branch can be described at the Table 1.

**Table 1:** Academic Service to Average Values of Importance and Performance

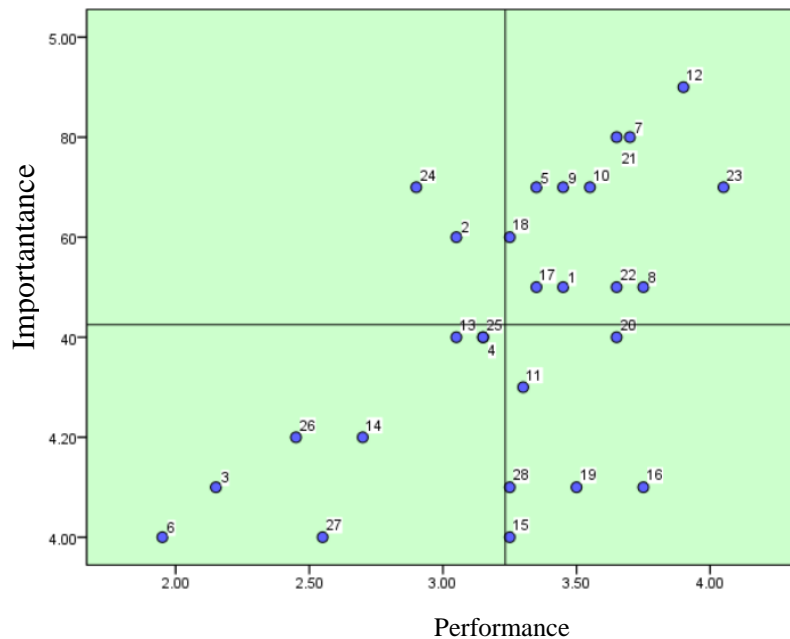
No.	Items	Important Scores	Performance Scores	Quadrant
2	The learning facilities are available in the classroom	4.60	3.05	A
24	Campus seeks to understand interest and student talents	4.70	2.90	A
1	The campus room is clean, neat, cool and comfortable	4.50	3.45	B
5	Worship facilities that students used	4.70	3.35	B
7	The lecturer delivering Learning Program Plan at the beginning of the lesson	4.80	3.70	B
8	Clarity of course material presented by lecturer	4.50	3.75	B
9	The lecturer returns the exam result / task with an objective value	4.70	3.45	B
10	Lecturers arrived on time	4.70	3.55	B
12	Campus provides Academic Advisor for Students	4.90	3.90	B
17	Student's problems / complaints are handled by the campus through the head of study program or academic supervisor	4.50	3.35	B
18	Every job / task is always restored on students	4.60	3.25	B
21	Lecturers are willing to help students who have difficulty in academic / subjects	4.80	3.65	B
22	Lecturers are willing to help students who have difficulty in the academic field /subject	4.50	3.65	B

	matter			
23	Lecturers openness, cooperative with students	4.70	4.05	B
3	The campus has a complete library	4.10	2.15	C
4	The availability of adequate and clean washroom facilities	4.40	3.15	C
6	The campus seeks to transparently explain the use of student funds	4.00	1.95	C
13	The campus helps students when faced with academic problems	4.40	3.05	C
14	The director and his staff provide time for parents to consult	4.20	2.70	C
25	The campus provides information on the lecture system in the form of a guidebook lectures	4.40	3.15	C
26	Campus provides academic information and non-academic services in the form of website (online)	4.20	2.45	C
27	Campus opened a complaint service for students who have problems	4.00	2.55	C
11	The ability of academic staff to serve the Student administration	4.30	3.30	D
15	The campus provides insurance assistance for students who get unfortunate accident	4.00	3.25	D
16	Academic administration staffs are polite in providing services	4.10	3.75	D
19	Sanctions for students who violate established campus rules and apply to all students without any exceptions	4.10	3.50	D
20	Campuses monitor the progress of students through academic supervisors / heads of study programs / faculty	4.40	3.65	D
28	The campus is trying to give a positive response to each student complaint	4.10	3.25	D

(Source: primary data analysis, 2018)

Based on table 1 above showed that the quality of academic services can be seen from the attributes of academic services from the average level of importance with the average level of performance in the field. With these average results, it will be converted into Cartesian diagram. Cartesian diagram is a diagram showing the importance and performance

of the academic services provided by the service provider. The Cartesian diagram can be seen in Figure 1.



**Figure 1:** Cartesian Diagram Attribute Quality of Academic Services

Based on the Figure 1, It gives a description concerning to the quality of academic services viewed from the importance desired by the respondent or the services customers concerning to the performance that occurred in the field. The assessed aspects can be seen from the four quadrants, namely: Quadrants A, B, C and D.

#### a. Quadrant A

The Quadrant A is an attribute that provides an illustration in this aspect which is considered to be highly contributing in influencing the service customers into the satisfaction of services. Besides that, it also becomes the elements of service that are considered very important, but the campus management has not implemented according to the importance of students as the customers of the service, consequently that they felt have no satisfaction. Therefore in this quadrant considered necessary to prioritize and improving its performance. As for the attributes, such as: (1) Learning facilities available in the classroom, and (2) The campus seeks to understand the students' interests and talents, the availability of reference books in the library. From these two points, the students' expectation should be considered by the campus but as a real showed that it was still low or less enough.

Based on the results of the data analysis, in accordance with the results of interviews which conducted to the one of the students receiving the service stating that:

“Politeknik Informatika Nasional Makassar of Alaudin Branch of relatively new branch, however, has been able to provide the best service to its students. However, there are still many weaknesses that must be addressed by the campus, such as: (1) the availability of learning space that must be improved, and (2) the campus has not given the students the opportunity to develop their talents and interests”.

### **b. Quadrant B**

In this quadrant indicates that academic services have been implemented well and must be maintained as they are important in order to provide satisfaction to students or customers of campus services. The attribute that gives contribution consists of 12 (twelve) attributes. In this attributes in which gives the highest contribution to the campus provides an Academic Advisor for Students.

Based on the results of the data analysis, then in accordance with the results of interviews from one of the respondents who revealed that:

“In the provision of academic services, the students are given academic counselors to interact more if they have difficulty in the learning process. Lecturers who are given the confidence to teach the subject have delivered the material according to the Semester Academic Plan that has been designed. In addition, lecturers arrived on time in delivering learning subjects”.

### **c. Quadrant C**

Based on the result showed that in this quadrant, it revealed some aspects of service that are less important for student satisfaction, but the implementation by service providers such as employees/staff, lecturers are considered mediocre, and in fact the level of performance against these attributes are still low in which between the values importance and performance are almost not too far apart, it contrasted with the Quadrant A, where the importance are high and performance are low, so then it needed to be improved. In this quadrant, there are seven attributes, where the lowest score (1.95) where the campus need to try to be transparently explaining the use of student funding, and the also the score of value was 2.55 is that the Campus has complete library references.

### **d. Quadrant D**

This quadrant attribute provides an idea that aspect levels of expectations are not so important, but can affect student satisfaction / service customers. The service recipient assumed that this attribute or service was less important, however, it gives a very meaningful satisfaction. Based on data analysis about the average reality experienced by the student shows that the lowest value of 6 (six) attributes is with the highest average value of 3.75 is the polite academic administration staff in providing services. In addition, which has a high value is the campus to monitor the progress of students through supervisor / head of study program / lecturers.

## **4.0 Conclusion**

The quality of academic services is reflected in 4 quadrants as the main dimensions of Importance Performance Analysis (IPA) Analysis Model. The quality of academic services can be seen from 4 (four) quadrants. In Quadrant A has been revealed that the academic services at Politeknik Informatika Nasional Makassar such as; classroom learning facilities and the attention of the campus to their students' interest and talent was still low. For Quadrant B showed that the ability of educators and educators such as faculty and staffs have provided the best service to their students. Quadrant C indicates that there were still many deficiencies in the provision of services such as; facilities and infrastructure included the limited facilities of worship and restroom, and also the openness of the campus in responding

to the students' complaints. Quadrant D indicates that staffs and lecturer's activation in providing services to students has showed a positive response for students.

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# Penerapan Kemahiran Insaniah Dalam Kalangan Pelajar Prauniversiti Di Malaysia

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## Abstrak:

Mendepani Revolusi Industri 4.0, peranan Prauniversiti di sekolah menengah di Malaysia perlu ditransformasikan ke arah melengkapi pelajar yang berketrampilan melalui pembangunan kurikulum yang relevan, ahli akademik yang berintegriti dan persekitaran akademik yang selesa serta pembelajaran berfokuskan pelajar (Pelan Strategik Pendidikan Tinggi, 2007). Belia berumur 17 hingga 40 tahun yang terlatih, cemerlang akademik dan berkemahiran tinggi adalah perkara utama dalam membangunkan ekonomi negara. Justeru itu, fungsi utama pendidikan adalah untuk menyediakan dan menghasilkan pelajar bagi memenuhi keperluan ekonomi negara dan global. Penerapan pelbagai kemahiran, terutamanya kemahiran insaniah untuk pelajar lepasan Sijil Pelajaran Malaysia (SPM), manakala ketika di Prauniversiti masih menjadi satu persoalan dan kebimbangan tentang keberhasilan dan persediaan pelajar Prauniversiti bagi melengkapi strategi pelaksanaan keempat iaitu kebolehpasaran belia negara bagi menerokai ekonomi negara dan antarabangsa. Kertas konsep ini akan menyentuh tentang kemahiran insaniah yang dimiliki oleh semua pelajar Prauniversiti, dan penerapan kemahiran insaniah oleh guru kepada pelajar selepas transformasi penjenamaan semula pengajian Prauniversiti dalam tahun 2014.

**Kata kunci:** Kemahiran Insaniah, Pelajar Prauniversiti

## 1.0 Pengenalan

Malaysia, antara negara yang sedang pesat membangun. Salah satu faktor yang mendorong kepada pembangunan sesebuah negara ialah masyarakatnya. Kenyataan ini disokong oleh Dessier (2001) yang menyatakan bahawa masyarakat yang mempunyai kelengkapan dan kesempurnaan pakej dalam meningkatkan prestasi dalam kerjayanya bukan sahaja berjaya dalam kehidupannya malah negara tanpa disedari. Dalam menghasilkan generasi yang berkualiti tinggi dan mampu menyumbang kepada pembangunan negara yang mantap, institusi-institusi pengajian tinggi memainkan peranan yang sangat penting sebagai institusi pengembangan ilmu dan kemahiran. Selain berfungsi sebagai institusi kecemerlangan ilmu, sekolah juga sangat berperanan melahirkan generasi berbakat besar yang berupaya untuk memenuhi keperluan semasa dan juga masa hadapan negara. Zain *et.al.* (2007) turut menjelaskan bahawa sekolah bukan hanya menghasilkan sumber manusia yang berilmu pengetahuan tetapi perlu juga menghasilkan modal insan atau pekerja yang mempunyai ciri-ciri kemahiran insaniah yang diperlukan oleh negara.

Melalui pendidikan dan kemahiran berkualiti dan menyumbang kepada pembangunan yang stabil, institusi pendidikan dapat memainkan peranan penting sebagai agensi pembangunan ilmiah. Selain berkhidmat sebagai institusi kecemerlangan pengetahuan, sekolah juga menghasilkan modal insan yang berbakat yang dapat memenuhi keperluan semasa dan masa hadapan. Kenyataan ini disokong oleh Zain *et.al.* (2007), sekolah bukan

sahaja menghasilkan sumber manusia pintar tetapi juga menghasilkan modal insan dengan ciri-ciri kemahiran insaniah yang diperlukan oleh kerajaan. Menurut Mohd Faizullah (2014), Kemahiran Insaniah atau "*soft skills*" sangat penting dan diberi penekanan oleh majikan kepada pelajar atau siswazah sebelum menerima pekerjaan atau tugas. Kemahiran insaniah harus dipupuk sejak dari sekolah rendah lagi untuk memastikan pembangunan masa depan dapat membentuk generasi belia sebagai insan yang seimbang dan harmonis. Kurikulum dan ko kurikulum adalah dua elemen yang mencipta individu seimbang bukan hanya dari perspektif fizikalnya, tetapi juga dari aspek jasmani, emosi, rohani, dan intelektual.

Di tengah-tengah persaingan ekonomi global, hakikatnya negara bergantung pada pengetahuan, kemahiran dan kompetensi yang dimiliki oleh belia (PPPM 2013-2025). Oleh itu, sektor pendidikan memainkan peranan yang sangat penting dalam menjana generasi dengan tahap pengetahuan yang tinggi dan lengkap dengan beberapa kemahiran yang boleh diterapkan apabila dilaksanakan kelak. Pengajian Prauniversiti mula beroperasi dalam perkhidmatan kerajaan sekolah tinggi setiap tahun selama lebih dari 50 tahun. Menerusi Laman Web Kementerian Pendidikan Malaysia (2017) menunjukkan, Kerangka Konseptual Prauniversiti terbahagi kepada dua komponen utama iaitu kurikulum dan kokurikulum. Pengajian Prauniversiti kini bermatlamat baru adalah untuk mewujudkan kepimpinan menuju ke arah Membina Negara Bangsa, yang meliputi aspek perpaduan, patriotisme, jati diri untuk menyokong aspirasi negara dan pendidikan holistik pelajar berdasarkan Falsafah Pendidikan Kebangsaan (FPK) 2017 dan berusaha untuk mengambil tanggungjawab ,prihatin, inovatif, jati diri, matang, berjiwa sendiri, berpandangan jauh, keteguhan jati diri dan sikap penyayang. Tiga kemahiran utama yang digunakan dalam pendidikan Prauniversiti setelah dijenamakan semula meletakkan 3 kemahiran utama iaitu kemahiran kognitif, kemahiran manipulasi, dan kemahiran insaniah.

Pelan Pembangunan Pendidikan Malaysia 2013-2025 (PPPM) menggariskan penjenamaan semula Prauniversiti agar menjadi salah satu inisiatif Kementerian Pelajaran Malaysia (KPM) dengan hasrat untuk memperkasakan Pendidikan Prauniversiti melalui peningkatan imej, sistem, dan kualiti pendidikan setara dengan jawatan pendidikan menengah lain selepas Sijil Pelajaran Malaysia (SPM) seperti Matrikulasi atau asasi sains, kerana ia dilihat sebagai salah satu laluan utama bagi pelajar untuk melanjutkan pelajaran mereka di samping dapat mengubah persepsi masyarakat terhadap pendidikan Prauniversiti serta dapat membangun dan memupuk nilai kepimpinan yang tinggi dalam kalangan pelajar Prauniversiti. Menurut Azalya (2003) dalam menghadapi cabaran globalisasi rakyat Malaysia perlu dilengkapi dengan asas pendidikan dan latihan yang kukuh serta memiliki pelbagai kemahiran termasuk mahir berkomunikasi dan penerapan bahasa yang baik. Selaras dengan hasrat dan cita-cita tinggi kerajaan Malaysia, Kementerian Pengajian Tinggi (KPT) telah merangka visi dan misi yang berdaya saing di peringkat antarabangsa. Visi Kementerian Pengajian Tinggi adalah untuk menjadikan Malaysia sebagai Pusat Kecemerlangan Pendidikan Tinggi pada tahun 2020, manakala misi Kementerian Pengajian Tinggi bermatlamat membangunkan dan mewujudkan persekitaran pendidikan tinggi untuk mewujudkan pusat ilmu pengetahuan yang unggul. dan generasi yang berwibawa, kompeten, inovatif dan bermoral untuk memenuhi keperluan negara dan antarabangsa (KPT, 2007).

## 2.0 Kajian Literatur

Menurut bekas Menteri Pengajian Tinggi Datuk Mustapa Mohamed, siswazah gagal mendapat pekerjaan adalah disebabkan mereka tidak memiliki kemahiran insaniah yang sangat diperlukan oleh majikan. Beliau berkata selain daripada lemah menguasai bahasa



Inggeris, terdapat juga belia yang berfikiran sempit, tiada ciri pemimpin, lebih bersemangat kekitaan dan tiada kemahiran untuk berkomunikasi. Melalui perbincangan di antara Kementerian Pengajian Tinggi dengan majikan di negara ini, ramai majikan menyatakan bahawa siswazah tidak diambil kerja kerana mereka tiada kemahiran insaniah (Bernama, 2007). Oleh yang demikian, satu kajian perlu dilaksanakan bagi mengenal pasti kemahiran insaniah yang dimiliki dan bagaimana kemahiran tersebut diterapkan oleh guru kepada pelajar Prauniversiti.

Pihak majikan terus membangkitkan isu kekurangan kemahiran yang ketara dalam kalangan pekerja baharu. Kaji selidik yang dijalankan Bank Dunia dan TalentCorp10 mendapati bahawa 90% daripada syarikat percaya bahawa siswazah universiti sepatutnya menjalani lebih banyak latihan industri sebelum mendapat ijazah, dan 81% daripada syarikat yang dikaji menganggap kemahiran berkomunikasi sebagai kekurangan utama dalam kalangan siswazah. Kebimbangan tentang kebolehgajian dan keupayaan menyesuaikan diri siswazah sering dikaitkan dengan keadaan sistem pendidikan negara, dan sistem pendidikan dan latihan teknikal dan vokasional (*technical and vocational education and training*, TVET). Rencana Prospek dan Dasar pada Tahun 2017 oleh Dian Hikmah Mohd Ibrahim dan Mohd Zaidi Mahyuddin ). Justeru itu, kajian ini penting untuk melihat penerapan kemahiran insaniah ini dalam kalangan pelajar Prauniversiti yang merupakan aset terpenting negara.

Malah, kajian Hussey (dalam Haslinda, Muhammad Nubli dan Zarina, 2005) "*soft skills*" atau kemahiran insaniah sangat diperlukan dalam bidang industri, maka program-program latihan amat dititikberatkan oleh pihak majikan. Oleh kerana itulah, pihak industri amat mengharapkan agar peranan dan tanggungjawab memberi pendedahan asas ini diambil alih oleh institusi pendidikan terutamanya di sekolah-sekolah dan tidak menghadkan hanya di institusi pengajian tinggi sahaja. Jelas di sini bahawa, keperluan bagi golongan belia lepasan sekolah menengah mendapat pendedahan dan pengalaman tujuh kemahiran insaniah ini adalah amat penting dalam menelusuri era k-ekonomi ini. Ini adalah kerana merekalah generasi yang akan meneruskan penerapan ekonomi negara di masa depan. Golongan belia, bermakna termasuklah mereka yang berada di Prauniversiti, Politeknik, Kolej dan juga Universiti. Pelajar Prauniversiti merupakan belia unik dengan keberadaan mereka di sekolah menengah, namun ini tidak langsung mencatitkan perwatakan imej penjenamaan semula Prauniversiti agar terus berdaya saing, berilmu dan berkemahiran, berdiri sebaris dengan pelajar yang berada di Politeknik, Kolej dan juga di Universiti.

## **2.1 Apa itu Kemahiran Abad ke 21? Kemahiran Insaniah?**

Kajian Norsuhaila (2007) terhadap amalan kepimpinan transformasi dalam kalangan pengetua sekolah menengah mendapati pengetua-pengetua menunjukkan tahap amalan kepimpinan yang tinggi berdasarkan semua dimensi. Namun pengkaji tidak mendapati perbezaan signifikan amalan kepimpinan transformasi pengetua berdasarkan faktor demografi yang dipilih iaitu jantina, umur dan pengalaman mengajar. Walau bagaimanapun, faktor guru menunjukkan perbezaan yang signifikan terhadap kepimpinan transformasi pengetua. Begitu juga dengan kajian Aziah et al. (2005) yang turut mendapati amalan kepimpinan transformasi guru besar berada pada tahap tinggi. Bagaimanapun, kajian Jamalsafri *et al.* (2011) menunjukkan bahawa tahap kepimpinan transformasi guru besar, dimensi karismatik, dimensi pertimbangan berasaskan individu, dimensi rangsangan intelek dan dimensi motivasi berinspirasi adalah pada tahap yang sederhana.

Kemahiran Abad 21 atau kemahiran masa depan merupakan Kemahiran Insaniah atau “soft skills”. Kemahiran Insaniah adalah sangat penting dan diperlukan oleh pelajar masa kini. Dengan penerapan kemahiran insaniah menjadikan seseorang dapat menyesuaikan diri bukan sahaja dengan perubahan dan perkembangan dalam sektor pekerjaan malahan dalam menghadapi kehidupan seharian di masa akan datang dalam era Revolusi Industri 4.0. Kemahiran insaniah turut menyediakan seseorang yang berperanan sebagai warga negara dan pekerja dalam mengharungi perubahan teknologi yang pesat dan berterusan (Sharifah Noor Anita, 2002). Bagi menggapai hasrat pendidikan yang telah digariskan dalam Pelan Pembangunan Pendidikan Negara, pelajar Prauniversiti merupakan antara aset penting dalam pembinaan pembangunan negara. Kokurikulum dan kurikulum merupakan dua elemen dalam menjana individu yang seimbang dari sudut jasmani, emosi, rohani dan intelektual. Justeru itu, hasil dari kupasan literatur kelak akan menunjukkan penerapan kemahiran insaniah adalah menjadi keperluan bagi pelajar Prauniversiti dalam mengisi ruang kosong yang merupakan satu platform serta mempunyai pertalian yang rapat dalam pembangunan kemahiran insaniah bagi menjana ketrampilan generasi Revolusi Industri ini.

Menurut satu kajian yang dijalankan di Australia, kemahiran insaniah (soft skills) dibahagikan kepada dua bahagian utama iaitu kemahiran asas dan kemahiran interpersonal (perhubungan). Kemahiran asas ini terdiri daripada kemahiran membaca dan menulis, kemahiran mengira, kemahiran menyelesaikan masalah, kemahiran teknologi maklumat dan kemahiran sistem berfikir. Manakala kemahiran interpersonal pula terdiri daripada kemahiran berkomunikasi, kemahiran kerja berpasukan, kemahiran menguruskan masa, keutamaan pelanggan, kemahiran berfikir dan kreativiti serta kemahiran refleksi (University College Dublin, 2001). Sehubungan dengan itu satu Modul Pembangunan Kemahiran Insaniah untuk Institusi Pengajian Tinggi Malaysia telah diperkenalkan. Pendekatan modul ini berfokuskan kepada gabungan pelbagai program atau aktiviti utama iaitu aktiviti normal pengajaran dan pembelajaran yang melibatkan semua elemen kurikulum dan kokurikulum, program sokongan yang berfokuskan akademik dan bukan akademik serta kehidupan mahasisiwa di kampus iaitu sama ada di kolej kediaman dan persekitaran kampus.

Pelaksanaan modul ini juga melibatkan tujuh elemen kemahiran insaniah yang telah dikaji dan mendapat pandangan pakar (Modul Pembangunan Kemahiran Insaniah (Softskills) untuk Institusi Pengajian Tinggi Malaysia, 2006). Terdapat tujuh elemen kemahiran insaniah yang dipilih untuk dilaksanakan di Institut Pengajian Tinggi adalah seperti berikut: (i). Kemahiran Komunikasi, (ii).Kemahiran Pemikiran Kritis (iii). Kemahiran Kerja Berpasukan, (iv). Kemahiran Penyelesaian Masalah (v). Kemahiran Pengurusan Maklumat. (vi). Kemahiran Kepimpinan dan (vii). Etika dan nilai moral profesional (Manual Kerja Kursus Prauniversiti/STPM 2017).

#### **a. Kemahiran Berkomunikasi**

Menurut Kementerian Pengajian Tinggi Malaysia (2006), kemahiran berkomunikasi merupakan komunikasi yang melibatkan dalam bahasa Melayu dan bahasa Inggeris dalam konteks yang berlainan, dan dengan peserta komunikasi yang berlainan. Aziz (2003) menyatakan komunikasi merupakan sesuatu penyampaian idea dan perasaan kepada sesuatu pihak yang lain. Proses komunikasi ini dapat berlaku pada bila-bila masa dan tidak dapat dielakkan oleh mana-mana individu (Hashim, 2001).

**b. Kemahiran Pemikiran Kritis**

Dengan adanya kemahiran berfikir kritis, masyarakat dapat menyuarakan pandangan, pendapat dan kritikan untuk mempengaruhi proses membuat keputusan serta menyelesaikan masalah ke arah membangunkan negara (Abd. Rahim Abd.Rashid, 1999). Justeru, pada tahun 1994, Kementerian Pendidikan Malaysia telah menetapkan kemahiran berfikir secara kritis supaya dijadikan sebagai sebahagian kemahiran untuk dijadikan asas pemerolehan ilmu dan kemahiran dalam mata pelajaran (Som, 2003).

**c. Kemahiran Kerja Berpasukan**

Kemahiran kerja berpasukan melibatkan kebolehan untuk berkerjasama dengan orang lain daripada pelbagai latar belakang sosio budaya untuk mencapai matlamat yang sama (Modul Pembangunan Kemahiran Insaniah, 2006). Menurut Ledia (2005) penerapan kemahiran bekerja dalam pasukan membolehkan pekerja bekerja secara produktif dalam pelbagai kumpulan yang berlainan. Tahap dalam kemahiran kerja berpasukan ini yang dirangkum dalam kategori Kemahiran Insaniah mesti berkebolehan membina hubungan yang baik, berinteraksi dengan org lain dan bekerja secara efektif bersama-sama untuk mencapai objektif yang sama, kebolehan memahami dan mengambil peranan bersilih ganti antara ketua kumpulan dan ahli kumpulan, juga berkebolehan mengenali dan menghormati sikap, kelakuan dan kepercayaan orang lain manakala tahap yang termasuk kategori Kemahiran Insaniah tambahan ini adalah memberi sumbangan kepada perancangan dan menyelaraskan hasil usaha kumpulan dan bertanggungjawab terhadap keputusan kumpulan (Kementerian Pengajian Tinggi Malaysia, 2006).

**d. Kemahiran Pengurusan Maklumat**

Menurut kajian Zahiyah dan Abdul Razak (2010), pembelajaran sepanjang hayat ialah satu proses pencarian ilmu pengetahuan sama ada untuk keperibadian atau golongan profesional yang berlaku sepanjang masa, bersifat sukarela dan atas motivasi sendiri. Pembelajaran seumur hidup bertujuan untuk membangunkan potensi seseorang menerusi proses pembelajaran yang berterusan yang boleh memberi motivasi dan memberi kuasa kepada individu untuk menguasai ilmu pengetahuan, menghayati nilai-nilai murni, dan memperluaskan pengalaman hidup supaya individu dapat menghadapi pelbagai cabaran kehidupan dengan jaminan dan kreativiti pembelajaran seumur hidup sejajar dengan keperluan sosial dan ekonomi semasa yang menggalakkan individu untuk menjadi aktif demi diri mereka sendiri. Pada abad ke-21 ini, perkembangan teknologi dan pelbagai perkara yang berkait rapat dengan kehidupan kita berlaku dengan amat pesat. Kita perlu sentiasa mengikuti perkembangan isu semasa bagi menghasilkan keputusan yang betul mengenai isu-isu yang penting sama ada berkaitan kerjaya, keluarga, masyarakat, atau Negara. Jadi, kemahiran pengurusan maklumat dan pembelajaran sepanjang hayat amat relevan dalam aspek ini.

**e. Kemahiran Penyelesaian Masalah**

Keperluan penerapan kemahiran pemikiran kritis bagi menyelesaikan masalah, seseorang individu harus berfikiran kritis, kreatif dan inovatif untuk merungkaikan permasalahan dan membuat keputusan yang tepat berdasarkan bukti yang dikemukakan. Ismail dan Atan (2010) ada menyatakan bahawa pemikiran kritis dan kemahiran menyelesaikan masalah membolehkan pelajar mengkaji secara mendalam

persoalan yang timbul dengan mudah di samping menjana teori, bukti dan data yang boleh menyokong dengan tepat dan menyeluruh.

#### **e. Kemahiran Kepimpinan**

Menurut Konn Sieng Chien (2002), kajian ilmiah mendapati pemimpin boleh dibangunkan. Dalam konteks yang sesuai kepimpinan amat di perlukan sama ada ia sebuah organisasi pendidikan, penyelidikan atau sebuah badan berteknologi tinggi malah kepimpinan dikehendaki untuk membawa organisasi ke tahap yang membanggakan. Kajian yang dilakukan oleh Stein dan Nelson (2003) juga mendapati bahawa pembangunan pelajar adalah antara pengetahuan yang perlu ada pada pemimpin pelajar. Pemimpin yang memahami keperluan pelajar dapat merancang program yang bersesuaian dengan pelajar. Implikasi melaksanakan program yang bersesuaian dengan pelajar ialah program tersebut dapat membantu mengubah tingkah laku pelajar yang seterusnya dapat memajukan pelajar.

#### **f. Etika dan nilai moral professional**

Nor'azzah (2002) menyatakan bahawa semangat dalam idea-idea umum dan kepercayaan masyarakat tentang kebaikan dan tingkah laku yang buruk seseorang itu dianggap sesuatu yang boleh dan tidak boleh dilakukan dan sepatutnya dan juga memerlukan seseorang melalui untuk membuat arah yang betul atau salah. Sementara Berthen (2003) menjelaskan bahawa pengelasan moral dari perspektif epistemologi dan etika, asal perkataan itu berbeza. Ia membawa nilai-nilai dan norma-norma yang membawa seseorang atau kumpulan dalam tingkah laku.

Dalam membawa konsep etika, menurut Solomon (1984) konsep etika kepada dua perkara asas iaitu pertamanya perangai individu, termasuk apa yang dimaksudkan sebagai 'seorang yang baik' dan keduanya, peraturan sosial yang mengawal serta menghadkan tingkah laku manusia terutama sekali tentang peraturan muktamad yang menjelaskan perkara baik dan buruk. Pendapat ini selari dengan pandangan Marzelah Maksin (2007) menjelaskan juga peranan etika sama pentingnya dengan cabang ilmu yang lain seperti falsafah dan pemikiran, memahami etika membantu seseorang membuat penilaian ke atas masalah yang dihadapi dalam sistem kehidupan, dalam proses pendidikan, pengurusan, perniagaan dan sebagainya. Peranan sains pemikiran dan etika dalam pembentukan paradigma pemikiran bersepadu di Malaysia telah diwujudkan melalui Rukun Negara, Wawasan 2020 dan dalam sistem pendidikan di Malaysia.

### **3.0 Metodologi**

Metodologi kajian merujuk kepada tatacara melaksanakan kajian (Chua Yan Piaw, 2006). Creswell (2012) mentakrifkan metodologi sebagai pendekatan yang digunakan dalam penyelidikan bagi mengumpul data. Bagi Azizi *et al.*, (2007), metodologi penyelidikan memberi panduan dalam pelaksanaan serta cara pelaksanaan sesuatu penyelidikan. Metodologi kajian menggunakan kaedah kualitatif iaitu temu bual separa struktur dan reka bentuk kajian adalah kajian kes merupakan kaedah yang paling berkesan untuk mengumpul maklumat kerana ianya melibatkan kos yang sangat minimum untuk mendapatkan keputusan kajian. Pemilihan peserta kajian ini adalah berpandukan kepada saranan Creswell (2007) dan Meriam (2009). Creswell (2007) menyatakan, kajian kualitatif yang ideal adalah dengan mendapatkan pelbagai perspektif yang berbeza mengenai skop yang dikaji. Meriam (2009) pula menyatakan, peserta kajian mestilah seseorang yang memahami budaya dan konteks

kajian, serta dapat menyatakan pandangan mengenai perkara yang hendak dikaji dengan jelas. Pengkaji menggunakan kaedah pemilihan peserta kajian secara bertujuan bagi memperoleh maklumat mendalam daripada peserta kajian; yang mempunyai banyak maklumat dan memahami fokus kajian mengenai kemahiran insaniah dan modal insan.



**Rajah 1:** Kerangka Konseptual Kemahiran Insaniah Prauniversiti

#### 4.0 Analisis Data

Analisis dilakukan setelah transkripsi temu bual telah disahkan oleh peserta kajian. Pengkaji mengikut tatacara teknik analisis perbandingan berterusan yang disarankan oleh Corbin dan Strauss (2008), Meriam (2009) dan Stake (2010) untuk menganalisis data kajian ini. Dalam analisis perbandingan berterusan, perbandingan data dilakukan untuk mengenal pasti persamaan dan perbezaan makna data (Merriam 2009). Penganalisan data adalah secara induktif di mana data yang mempunyai makna yang sama dikelompokkan dan diberi nama bagi membentuk tema atau kategori. Seterusnya, tema-tema dan sub tema dibina bagi setiap unit data yang ada dalam transkripsi. Pengkaji kemudiannya membuat pengelasan tema mengikut kategori-kategori. Setelah pengelasan tema mengikut kategori dilakukan, pengkaji menyemak semula tema-tema bagi setiap kategori. Seterusnya bagi setiap kategori, pengkaji membuat pengelasan tema-tema yang mempunyai pola yang sama dengan membentuk sub kategori-sub kategori. Semasa membuat pengelasan ini, perbandingan antara tema-tema dan subtema dilakukan bagi memastikan sesuatu tema atau subtema diletakkan dalam sub kategori yang betul. Objektif analisis ini adalah untuk mengenal pasti pola data (Merriam 2009).

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## 5.0 Perbincangan

Dari hasil perbincangan dan keputusan kajian lepas, telah menunjukkan bahawa kebanyakan kajian kemahiran insaniah lebih cenderung mengkaji satu kemahiran sahaja contohnya seperti kajian kemahiran berpasukan, kemahiran berkomunikasi, kemahiran keusahawanan berbanding mengkaji ketujuh-tujuh kemahiran. Malah semua kajian lepas mengukur tahap penerapan menggunakan kaedah kajian kuantitatif atau gabungan kuantitatif dan kualitatif. Sebagai contoh kajian Mustafa *et.al* (2008) Kemahiran Berpasukan Menerusi Penyertaan Di Kokurikulum Di Universiti Tun Hussein Onn Malaysia yang mana menunjukkan kemahiran berpasukan dan kesedaran pelajar terhadap kepentingan menyertai kokurikulum secara keseluruhannya adalah tinggi (skor min = 4.02 dan 4.13). Jelas bahawa tidak terdapat perbezaan yang signifikan terhadap kemahiran berpasukan di antara jantina dan fakulti. Perkaitan yang diperolehi ialah hubungan linear positif yang sederhana tetapi signifikan secara statistik antara penerapan kemahiran berpasukan dengan kesedaran kepentingan menyertai kokurikulum dalam kalangan pelajar.

## 6.0 Kesimpulan

Kajian ini penting dijalankan untuk melihat Penerapan Kemahiran Insaniah dalam kalangan pelajar Prauniversiti di Malaysia. Kajian tentang penerapan kemahiran insaniah pelajar-pelajar Prauniversiti ini adalah satu keperluan kerana kurangnya kajian yang dijalankan sebelum ini dan selepas Penjenamaan Semula Prauniversiti telah menjadi salah satu inisiatif Kementerian Pendidikan Malaysia (KPM) dalam Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013 - 2025 dengan hasrat untuk memperkasa pendidikan Prauniversiti melalui peningkatan imej, sistem, dan kualiti pendidikan setaraf dengan pendidikan lepasan menengah yang lain selepas Sijil Pelajaran Malaysia (SPM) seperti Matrikulasi atau institusi asasi sains. Ia juga dilihat sebagai salah satu laluan utama pelajar-pelajar untuk terus melanjutkan pelajaran ke universiti dan mengubah persepsi masyarakat terhadap pendidikan Prauniversiti disamping membangun dan memupuk nilai kemahiran insaniah dan modal insan yang tinggi dalam kalangan pelajar Prauniversiti. Kajian ini mempunyai implikasi pada penerapan kemahiran insaniah yang berkualiti bagi sektor pendidikan bagi persediaan Revolusi Industri 4.0. Dalam elemen berpengetahuan, kajian ini akan mendapati pelajar bahawa kemahiran ini sebagai satu keperluan bagi generasi masa akan datang. Penerapan 7 elemen kemahiran ini amat penting dalam pembangunan potensi pelajar selaras dengan kehendak masa depan di zaman maklumat di hujung jari.

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# Kajian Literasi Kepimpinan Instruksional Di Sekolah

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## Abstrak:

Kepimpinan instruksional merupakan satu bentuk kepimpinan yang terbukti mampu menyumbang kepada peningkatan prestasi akademik murid. Biarpun telah lebih 30 tahun kepimpinan ini wujud, ia didapati masih kekal relevan dalam arus pendidikan abad 21 malah menjadi lebih penting bagi mendepani segala cabaran yang ada. Kepimpinan instruksional ini terus menjadi kepimpinan yang perlu diamalkan oleh semua pemimpin memandangkan pengajaran merupakan teras utama dalam sesebuah sekolah dan ia perlu dipimpin dengan sebaiknya bagi memastikan keberhasilan murid tercapai selari dengan matlamat yang telah dibina. Kertas konsep ini akan membincangkan beberapa perkara berkaitan kepimpinan instruksional seperti definisi kepimpinan instruksional dan kajian-kajian lepas berkaitan amalan kepimpinan instruksional di sekolah dari dalam dan luar negara.

**Kata kunci:** Kepimpinan Instruksional, Definisi, Kajian Literasi

## 1.0 Pengenalan

Pendidikan di Malaysia telah berkembang dengan pesat semenjak negara ini mengecapi kemerdekaan enam dekad yang lalu. Kerajaan Malaysia sentiasa prihatin dengan mengambil inisiatif untuk meletakkan sistem pendidikan negara setanding sistem pendidikan di negara-negara maju serta mengikut arus perubahan dan pembangunan yang bersesuaian dengan kehendak global. Perdana Menteri Malaysia, Yang Amat Berhormat Dato' Seri Haji Mohd. Najib Bin Tun Haji Abdul Razak turut mengambil pendekatan yang sama seperti mana kepimpinan yang terdahulu dengan memartabatkan pendidikan Malaysia ke arah yang lebih maju dan berdaya saing.

Pada 11 Julai 2009, Yang Amat Berhormat, Perdana Menteri Malaysia telah pun mengumumkan enam Bidang Keberhasilan Utama Negara atau *National Key Result Areas* (NKRA) yang merupakan satu usaha kerajaan Malaysia untuk memenuhi keperluan dan kehendak rakyat sejurus memenangi Pilihan Raya Umum ke 12 pada tahun 2008. Enam bidang dalam NKRA tersebut ialah mengurangkan kadar jenayah, memerangi rasuah, meluaskan akses kepada pendidikan berkualiti dan berkemampuan, meningkatkan taraf hidup rakyat berpendapatan rendah, memperkasa prasarana luar bandar dan pedalaman, serta menambah pengangkutan awam dalam jangka masa sederhana (*Performance Management and Delivery Unit* (PEMANDU), 2010).

Di bawah NKRA ketiga atau turut dikenali sebagai NKRA Pendidikan terdapat empat sub-NKRA yang menjelaskan secara terperinci fungsi NKRA berkenaan. Empat sub-NKRA tersebut ialah prasekolah, saringan literasi dan numerasi (LINUS), sekolah berprestasi tinggi dan tawaran baharu (*new deal*) kepada pemimpin sekolah yang berjaya meningkatkan kecemerlangan sekolah. Berdasarkan sub-NKRA ini, maka jelas dilihat terutama dalam sub-

NKRA keempat, bahawa aspek kepemimpinan pengetua dan guru besar merupakan satu elemen yang begitu penting dalam usaha memartabatkan sistem pendidikan di Malaysia. Dalam sub NKRA keempat ini juga ada dinyatakan bahawa pemimpin sekolah telah terbukti boleh meningkatkan pencapaian akademik murid (*Performance Management and Delivery Unit (PEMANDU)*, 2010). Dengan kata lain, pemimpin sekolah memberi kesan kepada peningkatan prestasi akademik murid sama ada secara langsung atau tidak (Jackson, Davis, Abeel, & Bordonaro, 2000; Marzano, 2003). Malah ada kajian yang menjelaskan bahawa wujud hubungan yang kuat antara pencapaian akademik murid dengan kepemimpinan pemimpin sekolah (Wilson, 2016).

Terdapat persetujuan dalam kalangan sarjana, pengamal pendidikan dan pembuat dasar yang menyatakan bahawa kepemimpinan pemimpin sekolah merupakan penyumbang utama kepada peningkatan prestasi dan kejayaan sistem sesebuah sekolah (Fullan, 2007; Harris, 2013; Leithwood & Jantzi, 2005). Mereka juga merumuskan bahawa kepemimpinan pemimpin sekolah menyumbang kepada prestasi sekolah yang lebih baik dan juga meningkatkan pencapaian akademik murid (Day, Sammons, Hopkins, Leithwood, & Kington, 2008; Hallinger & Heck, 1996; Leithwood, Harris, & Hopkins, 2008). Perkaitan antara kepemimpinan sekolah dan pencapaian akademik murid juga ada dinyatakan secara khusus oleh Bogler (2005) serta Waters, Marzano, dan McNulty (2003) yang menyatakan bahawa gaya kepemimpinan seorang pemimpin sekolah boleh mempengaruhi pelbagai elemen dalam persekitaran sekolah termasuk sikap guru dan kakitangan, proses pengajaran dan pembelajaran serta pencapaian akademik murid.

Oleh yang demikian, Kementerian Pendidikan Malaysia (KPM) telah menggariskan tiga pendekatan bagi meningkatkan keberhasilan murid menerusi peningkatan prestasi pemimpin sekolah. Pendekatan pertama ialah pemimpin sekolah perlu berperanan sebagai pemimpin instruksional yang terlibat secara aktif dalam pembangunan guru dengan cara merancang, menyelaras dan menilai proses pengajaran dan pembelajaran (PdP) di sekolah; kedua, pemimpin sekolah sebagai agen perubahan utama dengan memastikan visi dan misi diterjemahkan selaras dengan matlamat sekolah demi kementerian murid; dan ketiga, pemimpin sekolah perlu mewujudkan persekitaran sekolah yang kondusif dan menyokong proses PdP di dalam dan di luar bilik darjah (Kementerian Pendidikan Malaysia, 2013).

Dalam Laporan Awal Pelan Pembangunan Pendidikan Malaysia 2013-2025 dengan jelas menyatakan keberhasilan murid dapat ditingkatkan sebanyak 20 peratus sekiranya pemimpin sekolah mengamalkan kepemimpinan instruksional. Laporan ini turut mencadangkan agar tanggungjawab sebagai pemimpin instruksional tidak hanya terletak di bahu pemimpin sekolah semata-mata, malah guru penolong kanan, ketua bidang dan ketua panitia turut perlu dibangunkan dan diberi amanah sebagai pemimpin instruksional (Kementerian Pendidikan Malaysia, 2012). Berdasarkan penjelasan ringkas ini maka terbukti kepemimpinan instruksional ialah satu model kepemimpinan yang masih lagi relevan dan dipercayai mampu membawa sekolah-sekolah di bawah KPM bergerak terus maju ke hadapan dalam meningkatkan pencapaian akademik dan sahsiah murid serta terus mampu melahirkan modal insan yang berkualiti.

## 2.0 Kajian Literatur

### 2.1 Definisi Kepimpinan Instruksional

Instruksional berasal daripada perkataan "*instruction*" yang bermakna pengajaran. Dalam konteks sekolah dan penggunaan seharian, istilah pengajaran lebih biasa digunakan daripada istilah instruksional tetapi atas sebab keghairahan dan eksklusiviti yang dikaitkan dengan maksudnya dalam Bahasa Inggeris, maka istilah "kepimpinan instruksional" lebih kerap digunakan berbanding dengan "kepimpinan pengajaran" walaupun kedua-duanya membawa pengertian yang sama iaitu segala tindakan dan aktiviti yang dilaksanakan oleh seorang pemimpin sekolah yang bertujuan memantapkan proses PdP (James & Balasandran, 2013). Terdapat pelbagai definisi kepimpinan instruksional yang dinyatakan oleh ramai penyelidik atau sarjana kepimpinan pendidikan. Antaranya ialah satu bentuk kepimpinan yang mampu memberi kesan kepada pembangunan sekolah (Kis & Konan, 2014) dan juga satu kepimpinan yang menggunakan pengetahuan dalam menyelesaikan masalah akademik dan menjadikan guru mengetahui peranan mereka dalam merealisasikan matlamat sekolah (Krug, 1992).

Drake dan Roe (2002) pula mentakrifkan kepimpinan instruksional sebagai sebarang usaha ke arah menggalakkan dan menyokong pihak-pihak yang terlibat dalam proses PdP untuk mencapai matlamat sekolah dan pembentukan satu sistem sosial sekolah yang kukuh. Menurut Hallinger dan Murphy (1985a), kepimpinan instruksional ialah sebarang aktiviti yang dilaksanakan oleh pentadbir sekolah dengan hasrat untuk meningkatkan kejayaan proses PdP dan juga pembangunan sekolah. Kepimpinan instruksional juga dikatakan sebagai rantaian tindakan yang diambil oleh pemimpin sekolah dengan tujuan untuk meningkatkan perkembangan pembelajaran murid (De Bevoise, 1984) dan juga keadaan pembelajaran murid di sekolah (Greenfield, 1987).

Sisman (2016) merujuk kepimpinan instruksional sebagai kuasa dan tingkah laku yang digunakan oleh pemimpin sekolah, guru dan penyelia sekolah untuk mempengaruhi individu dan situasi di dalam sekolah. Aspek paling penting yang membezakan kepimpinan instruksional dengan kepimpinan pendidikan yang lain ialah ia memberi tumpuan kepada proses PdP di sekolah. Menurut beliau lagi, terdapat lima tingkah laku kepimpinan instruksional yang perlu dipraktikkan oleh pemimpin sekolah iaitu pertama, menentukan dan berkongsi objektif sekolah; kedua, mentadbir kurikulum dan proses instruksional; ketiga, menilai proses instruksional dan pencapaian akademik murid; keempat, menyokong dan meningkatkan kualiti guru dan kelima, membentuk persekitaran pembelajaran dan iklim sekolah yang positif.

Manakala menurut Hallinger (2011, 2000, 1987) pula, kepimpinan instruksional ialah usaha yang dilaksanakan oleh pemimpin sekolah untuk meningkatkan proses PdP dan pembelajaran yang melibatkan guru, ibu bapa, murid, dan juga gabungan perancangan, pengurusan, kemudahan dan budaya sekolah. Pemimpin sekolah perlu memastikan setiap individu di sekolah berusaha dan saling bantu-membantu dalam melaksanakan program pendidikan yang terbaik. Melalui definisi ini, maka wujudlah tiga dimensi utama kepimpinan instruksional iaitu mentakrif matlamat, mengurus program instruksional dan menggalakkan iklim sekolah yang akan menjadi antara teras penting dalam kertas konsep ini.

## 2.2 *Kajian-kajian Lepas Tentang Kepimpinan Instruksional di Sekolah*

Terdapat banyak kajian lepas sama ada daripada dalam dan luar negara yang membincangkan mengenai kepimpinan instruksional. Kajian yang melibatkan pelbagai peringkat persekolahan ini, telah mengkaji mengenai amalan kepimpinan instruksional di seluruh dunia, faktor-faktor yang mempengaruhi kejayaan pelaksanaan kepimpinan instruksional, dan mengaitkan kepimpinan instruksional dengan pelbagai pemboleh ubah bersandar yang lain seperti pencapaian akademik murid, faktor-faktor demografi seperti jantina, efikasi sendiri guru, bidang penyeliaan, kurikulum dan sebagainya. Tahap kefahaman dan pelaksanaan amalan kepimpinan instruksional merupakan subjek yang sering menjadi pilihan para pengkaji. Antaranya ialah kajian mengenai amalan kepimpinan instruksional guru besar di Malaysia. Harris, Jones, Cheah, Devadason, dan Adam (2017) telah menjalankan satu penyelidikan yang bertujuan meneroka amalan kepimpinan instruksional dalam kalangan guru besar di sekolah rendah di Malaysia. Kajian kualitatif yang menggunakan kaedah temu bual separa struktur sebagai alat pengumpulan data ini telah dijalankan terhadap 30 orang guru besar yang terdiri daripada 14 guru besar sekolah kebangsaan, sembilan guru besar sekolah jenis kebangsaan Cina (SJKC) dan tujuh guru besar sekolah jenis kebangsaan Tamil (SJKT). Dapatan kajian menunjukkan guru besar yang ditemu bual faham dan boleh menerangkan tanggungjawab yang telah mereka laksanakan yang berkaitan dengan amalan instruksional. Secara khusus, mereka melakukan penyeliaan instruksional terhadap semua guru dan menggariskan cara mereka memantau kualiti proses PdP di dalam bilik darjah. Dapatan kajian juga telah berjaya mendedahkan bahawa sebahagian daripada tugas dan tanggungjawab pemimpin sekolah di Malaysia sama ada guru besar atau pengetua didapati selari dengan amalan-amalan kepimpinan instruksional yang digariskan oleh sarjana barat. Selain itu, dapatan kajian juga menunjukkan penyeliaan proses PdP bergerak seiring dengan pembelajaran profesional dalam kalangan guru di 30 buah sekolah tersebut.

Setelah mengetahui pelaksanaan kepimpinan instruksional di Malaysia, maka satu kajian untuk meneliti peranan kepimpinan instruksional dalam membangunkan visi dan mengurus segala hal berkaitan pengajaran di Singapura telah dilaksanakan oleh Nguyen, Ng, dan Yap (2017). Tujuan kajian ini adalah untuk meneroka amalan kepimpinan instruksional di sekolah rendah di Singapura. Kajian ini menggunakan kaedah kualitatif dengan melibatkan temu bual terhadap 30 orang guru besar dan 25 hari pemerhatian terhadap lima orang guru besar. Dapatan kajian yang menggunakan reka bentuk kajian teori bersebab (*grounded theory*) ini menunjukkan peranan kepimpinan instruksional guru besar boleh dikategorikan kepada empat tema utama iaitu pembangunan visi dan pelaksanaan, struktur organisasi dan fizikal, pembangunan profesional, dan mengetuai dan mengurus aspek pengajaran. Manakala dapatan yang paling penting dalam kajian ini ialah satu struktur kepimpinan instruksional hibrid yang menggabungkan elemen hierarki (seorang penguasa tertinggi tunggal) dan heterarkis (organisasi tidak bergantung hanya pada seorang pemimpin tertinggi tunggal) dapat dibangunkan dan menjadi asas kepada sekolah di Singapura untuk memantapkan amalan kepimpinan instruksional.

Penetapan misi, mengurus kurikulum dan pengajaran, dan membangunkan iklim sekolah yang menyokong pembelajaran terbukti merupakan dimensi utama yang perlu diamalkan oleh pemimpin instruksional sama ada mengikut konteks pendidikan di barat atau di timur. Hallinger, Walker, Nguyen, Truong, dan Nguyen (2017) telah menjalankan satu kajian yang mempunyai tiga tujuan iaitu pertama untuk mendapatkan pandangan guru besar sekolah rendah terhadap peranan mereka sebagai pemimpin instruksional; kedua,

menerangkan amalan-amalan kepemimpinan instruksional yang lihat penting oleh mereka; dan ketiga, membangunkan sebuah model kepemimpinan instruksional mengikut konteks pendidikan di Vietnam. Kajian berbentuk teori bersebab (*grounded theory*) ini telah dijalankan secara temu bual separa berstruktur terhadap 27 orang guru besar sekolah rendah di wilayah utara, tengah dan selatan Vietnam. Kajian ini berjaya menghasilkan satu model kepemimpinan instruksional mengikut konteks pendidikan di Vietnam dengan memperlihatkan persamaan dengan model kepemimpinan instruksional di negara barat iaitu dari segi dimensi memberi fokus kepada penetapan arah tuju sekolah, menguruskan kurikulum dan pengajaran, dan membangunkan iklim pembelajaran di sekolah. Walaupun begitu wujud perbezaan amalan kepemimpinan instruksional yang dipraktikkan di Vietnam berbanding negara barat. Perbezaan tersebut adalah terhadap dua perkara. Pertama, amalan membina perpaduan (*solidarity*) dalam kalangan guru dan kedua; mengurus hubungan luaran yang wujud antara sekolah dan organisasi luar. Dapatan kajian juga mendapati wujud beberapa amalan yang berbeza dan tersendiri yang diamalkan oleh pemimpin instruksional di Vietnam yang mana pengkaji dapati boleh dikaitkan dengan konteks institusi, politik dan sosio-budaya pendidikan dalam masyarakat di Vietnam.

Kajian mengenai pelaksanaan kepemimpinan instruksional oleh pemimpin sekolah di Swaziland telah dilakukan oleh Merwe dan Schenck (2016) dengan melibatkan lapan buah sekolah rendah di Hhohho iaitu wilayah selatan Swaziland. Kajian kualitatif ini menggunakan sepenuhnya kaedah pengumpulan data secara temu bual bagi mengkaji pelaksanaan kepemimpinan instruksional dalam kalangan pemimpin sekolah tersebut. Dapatan kajian menunjukkan dua ciri amalan kepemimpinan instruksional yang dipraktikkan. Ciri-ciri tersebut ialah pertama, usaha kolaboratif warga sekolah berdasarkan kepemimpinan yang dikongsi bersama dan hubungan interpersonal yang sihat akan memberi kesan yang optimum terhadap pembelajaran murid; dan kedua, pemimpin sekolah ialah ketua eksekutif yang kekal bertanggungjawab untuk memastikan proses PdP secara kolaboratif dapat berfungsi dengan baik. Berdasarkan konteks pendidikan di Swaziland, tanggungjawab ini secara tersirat merupakan satu gabungan kepemimpinan yang dikongsi dan kepemimpinan arahan untuk pembelajaran murid berdasarkan kelakuan baik pemimpin sekolah tersebut. Selain dapatan di atas, kajian ini juga berjaya meneroka faktor-faktor utama dalam menjayakan program-program kepemimpinan instruksional di sekolah iaitu sokongan kolaboratif daripada panel mata pelajaran, pengiktirafan bagi setiap pencapaian, hubungan interpersonal yang sihat dan sentiasa melindungi masa instruksional.

Berdasarkan kajian yang dilakukan oleh Manaseh (2016) berkenaan amalan kepemimpinan instruksional di enam buah sekolah menengah di Iringa, Tanzania, didapati pemimpin sekolah, guru kanan akademik (*senior academic master*), guru dan murid belum biasa dengan konsep atau model kepemimpinan instruksional. Pemahaman dan pengetahuan umum yang ada pada pemimpin sekolah mengenai kepemimpinan instruksional tidak membantu mereka untuk menjalankan fungsi atau peranan yang ada dalam kepemimpinan tersebut. Kajian yang dijalankan secara kualitatif ini juga mendapati semua enam orang pemimpin sekolah yang dipilih tidak efektif dalam mengurus program-program instruksional di sekolah yang disebabkan oleh ketidakmampuan mereka memahami peranan yang perlu mereka laksanakan berpunca daripada ilmu yang terhad mengenai kepemimpinan instruksional.

Yunita (2015) menjalankan kajian mengenai amalan kepemimpinan instruksional di Indonesia dengan tujuan untuk menganalisis peranan pemimpin sekolah dalam pelaksanaannya menerusi perspektif pemimpin sekolah itu sendiri dan juga guru. Kajian ini dilaksanakan secara kualitatif dengan menemu bual tiga orang pemimpin sekolah dan tiga

orang guru daripada tiga buah sekolah yang berbeza. Kajian ini menemukan beberapa dapatan mengenai amalan kepimpinan instruksional di Indonesia. Antaranya ialah, kedua-dua pihak iaitu pemimpin sekolah dan guru berpandangan bahawa kepimpinan instruksional ialah satu nilai penting yang pemimpin sekolah perlu laksanakan di setiap sekolah. Kepimpinan instruksional juga merupakan satu sikap positif yang perlu dimiliki oleh setiap pemimpin sekolah dan juga satu bentuk kepimpinan yang berkait dengan sekolah berkesan. Selain itu, kepimpinan instruksional juga ialah satu cara bagaimana mendelegasikan dan menguruskan aktiviti sekolah kepada ahli di dalamnya. Kerajaan Indonesia juga sangat menggalakkan pemimpin sekolah untuk melaksanakan kepimpinan instruksional dan percaya bahawa kepimpinan tersebut ialah satu ciri tingkah laku yang perlu ada pada pemimpin sekolah efektif.

Hui-Ling, Fong-Yee, dan June (2014) telah menjalankan kajian mengenai amalan kepimpinan instruksional pemimpin sekolah di Taiwan. Tujuan kajian ini adalah untuk menilai bagaimana konsep kepimpinan instruksional yang berasal daripada sistem pendidikan barat diterjemahkan kepada sistem pendidikan di Taiwan. Kajian ini menggunakan kaedah kajian meta-analisis yang secara sistematik menganalisis 80 kajian sepanjang dua dekad yang lalu. Dapatan kajian menunjukkan pemimpin sekolah di Taiwan melaksanakan kepimpinan instruksional secara tidak langsung berbanding secara langsung. Mereka juga didapati mengamalkan kepimpinan instruksional namun masih memperuntukkan masa yang banyak untuk menyelesaikan urusan-urusan pentadbiran. Hasil kajian menunjukkan sebab utama pemimpin sekolah di Taiwan mengamalkan kepimpinan instruksional secara tidak langsung, seperti hanya menyokong persekitaran kerja di sekolah (aktiviti paling kerap dilaksanakan) kerana kekurangan kuasa yang sah untuk menjalankan aktiviti pemantauan PdP secara berjalan (*walk-through observation*) dan juga kekurangan latihan dalam pembangunan kurikulum dan pedagogi. Dua sebab utama ini merupakan punca utama kepada kegagalan pemimpin sekolah di Taiwan untuk lebih menjalankan kepimpinan instruksional secara langsung.

Faktor-faktor yang mempengaruhi kejayaan pelaksanaan kepimpinan instruksional oleh pemimpin sekolah turut menjadi isu yang dikaji secara ilmiah. Simin, Sani, Komathi, Kumar, dan Amuta (2015) telah menjalankan satu kajian untuk mengenal pasti faktor-faktor yang mempengaruhi amalan kepimpinan instruksional pengetua Kolej Teknik dan Vokasional di Malaysia dari perspektif guru. Kajian yang menggunakan kaedah kuantitatif ini melibatkan 80 orang guru Kolej Teknik dan Vokasional di Kuala Lumpur, Malaysia. Dapatan kajian menunjukkan ada empat domain atau bidang yang menjadi faktor terpenting dalam amalan kepimpinan instruksional iaitu kepimpinan profesional, perkongsian misi dan matlamat yang jelas, pemantauan berterusan terhadap kemajuan guru dan perkembangan profesionalisme guru. Berdasarkan dapatan kajian ini maka boleh disimpulkan bahawa faktor-faktor yang membawa kejayaan pelaksanaan amalan kepimpinan instruksional ini mempunyai persamaan dengan dimensi kepimpinan instruksional yang telah dinyatakan oleh para sarjana kepimpinan instruksional seperti keperluan memiliki misi, visi atau matlamat, kepentingan peranan pemimpin, pemantauan terhadap kualiti pengajaran guru dan menggalakkan perkembangan profesional dalam kalangan guru.

Setelah meneliti semua faktor yang mempengaruhi kejayaan kepimpinan instruksional, maka kajian bagi mengenal pasti ciri-ciri pemimpin sekolah telah dilaksanakan agar segala amalan baik yang dilakukan oleh pemimpin sekolah tersebut dapat dikongsi bersama pemimpin sekolah yang lain. Day (2015) dalam kajian mengenai *International Successful School Principals Project (ISSPP): Multi-Perspective Research on School Principal*

mendapati bahawa antara ciri pemimpin sekolah yang berjaya ialah mereka mengamalkan kepimpinan instruksional dan transformasi dalam memimpin sekolah ke arah pencapaian yang lebih baik dalam kalangan guru dan juga murid. Apa yang menarik kajian ini merupakan projek pertama di dunia yang melakukan kajian secara kolaboratif bersama 25 buah negara termasuk Malaysia. Kajian ini mempunyai beberapa kelebihan utama berbanding kajian sebelum ini iaitu ia lebih kepada berbentuk kualitatif dengan meletakkan persoalan seperti bagaimana dan mengapa sesuatu perkara itu berlaku. Kajian sebelum ini dilihat lebih bersifat kuantitatif yang hanya mengukur tahap sesuatu amalan kepimpinan itu terlaksana. Kelebihan seterusnya ialah kajian ini memberi fokus yang lebih kepada sekolah dan pemimpin sekolah yang berjaya. Maka, kajian ini boleh dijadikan antara rujukan utama kepada penyelidik yang ingin mengkaji kejayaan seseorang pemimpin sekolah dalam membawa sekolah mereka ke tahap yang membanggakan.

Pengaruh kepimpinan instruksional terhadap pencapaian akademik murid sering menjadi perdebatan dalam kalangan sarjana kepimpinan. Maka, banyak kajian lepas yang membincangkan hubungan antara kepimpinan instruksional dengan pencapaian akademik murid sama ada secara langsung atau tidak. Alam dan Ahmad (2017) dalam kajian mereka yang bertujuan menganalisis impak kepimpinan instruksional, komuniti profesional dan tanggungjawab tambahan “bukan-pengajaran” guru terhadap pencapaian akademik murid pula mendapati bahawa ketiga-tiga pemboleh ubah bebas tersebut memberi kesan kepada pencapaian akademik murid melalui pemboleh ubah pengantara iaitu komitmen guru. Kajian ini melibatkan 214 orang guru daripada 88 buah sekolah rendah di Pakistan. Kajian ini juga mempunyai beberapa implikasi terhadap pengurusan pendidikan dan juga polisi berkaitan pengajaran guru di sekolah yang mana pertama, pemimpin sekolah tidak sepatutnya melibatkan guru dengan tugas-tugas “bukan-pengajaran” sama ada di dalam dan di luar sekolah seperti menjalankan kempen memerangi demam denggi, kempen pendaftaran pelajar baharu, program bancian, membantu urusan pilihan raya negara dan sebagainya; kedua, menggalakkan semua pemimpin sekolah mengamalkan kepimpinan instruksional di sekolah; dan ketiga, pemimpin sekolah perlu membentuk satu jaringan guru bagi memudahkan perbincangan dan perkongsian ilmu dan pengalaman dalam kalangan guru.

Pelaksanaan kepimpinan instruksional di sekolah kurang murid turut dikaji bagi mengetahui corak pelaksanaannya dan kaitannya dengan pencapaian akademik murid di sekolah tersebut. Zakaria (2016) telah menjalankan kajian berkenaan kepimpinan instruksional guru besar di sekolah kurang murid di Malaysia yang bertujuan menganalisis amalan kepimpinan instruksional guru besar di sekolah kurang murid (SKM), pencapaian akademik murid, profesionalisme guru, dan iklim sekolah di kawasan terpinggir dan pedalaman. Kajian yang melibatkan 334 orang guru besar yang diberikan soal selidik dan enam orang guru besar yang ditemu bual mendapati bahawa guru besar SKM ada mengamalkan ketiga-tiga dimensi kepimpinan instruksional. Bagaimanapun dimensi menggalakkan iklim sekolah lebih jelas diamalkan oleh mereka. Hasil kajian juga menunjukkan terdapat hubungan positif yang lemah antara amalan kepimpinan instruksional dengan pencapaian akademik murid. Hal demikian berlaku kerana terdapat pelbagai faktor lain seperti faktor murid, ibu bapa, komuniti, dan budaya masyarakat di kawasan terpinggir yang kurang memberi tumpuan kepada pendidikan dan semua faktor ini turut menjadi penyumbang kepada penurunan pencapaian akademik murid. Selain itu, kajian ini juga menunjukkan tiga dapatan lain iaitu pertama, guru besar di SKM mempunyai beban tugas yang berlebihan dalam melaksanakan kepimpinan instruksional kerana kekurangan sumber manusia di sekolah; kedua, guru besar SKM yang menekankan proses PdP di dalam bilik darjah dapat menunjukkan keberhasilan dalam pencapaian akademik murid; dan ketiga, gaya

kepimpinan instruksional merupakan tuntutan profesional yang wajar diamalkan oleh setiap guru besar selaras dengan kehendak Program Transformasi Daerah (PTD) yang menyarankan agar pemimpin sekolah berubah watak daripada pemimpin *ceremonial* kepada pemimpin instruksional.

Menurut Day, Gu, dan Sammons (2016) pula kepimpinan sekolah sangat berkait rapat dengan pencapaian akademik murid. Kajian mereka berkenaan impak kepimpinan instruksional dan transformasi terhadap pencapaian akademik murid akan meneroka bagaimana pemimpin sekolah menggunakan strategi kedua-dua jenis kepimpinan tersebut dalam meningkatkan pencapaian akademik murid. Kajian yang menggunakan kaedah penyelidikan campuran ini menyiasat mengenai perkaitan antara keberkesanan kepimpinan pemimpin sekolah dan pencapaian akademik murid di sekolah rendah dan menengah di England berdasarkan pencapaian peperiksaan peringkat nasional dalam tempoh 3 tahun. Terbukti secara empirikal bahawa pemimpin sekolah boleh meningkatkan pencapaian akademik murid mereka dengan menggabungkan strategi yang terdapat dalam kepimpinan instruksional dan transformasi. Walau bagaimanapun, keupayaan sekolah untuk meningkatkan ataupun mengekalkan kecemerlangannya dalam tempoh masa yang panjang bukan bergantung pada gaya kepimpinan semata-mata. Lebih daripada itu, ia juga sangat bergantung kepada dua aspek yang sama penting iaitu pertama, sejauh mana pemimpin sekolah faham dan kemudiannya mendiagnosis keperluan sekolah. Mereka turut perlu mengetahui perkaitan antara memahami keperluan dan mendiagnosis keperluan secara jelas. Aspek kedua ialah nilai positif yang ada dikongsi bersama dalam satu organisasi dan ia tertanam dalam budaya kerja dan pencapaian sekolah. Ini bermakna kajian ini membuktikan bahawa selain dari aspek kepimpinan terdapat aspek lain yang tidak kurang pentingnya dalam usaha meningkatkan pencapaian akademik murid. Aspek memahami dan mendiagnosis keperluan sekolah dan juga perkongsian nilai positif dalam kalangan warga sekolah juga perlu dititikberatkan kerana ia juga antara faktor besar yang mempengaruhi peningkatan akademik murid.

Impak kepimpinan instruksional dalam meningkatkan pencapaian akademik murid turut dibandingkan dengan kepimpinan yang lain bagi mengetahui kepimpinan yang paling tepat untuk dilaksanakan dalam memajukan sekolah. Menurut Shatzer *et al.* (2014) dalam kajian mereka ini mempunyai tiga tujuan iaitu pertama, membandingkan model kepimpinan instruksional dan transformasi; kedua, menyiasat impak pemimpin sekolah terhadap pencapaian akademik murid; dan ketiga, menentukan amalan kepimpinan secara specific yang boleh dikaitkan dengan peningkatan pencapaian akademik murid. Dapatan kajian menunjukkan bahawa kepimpinan instruksional menjelaskan lebih banyak varians dalam pencapaian akademik murid berbanding dengan apa yang dilakukan oleh kepimpinan transformasi. Dengan kata lainnya, kepimpinan instruksional memberi impak yang lebih kuat terhadap pencapaian akademik murid berbanding kepimpinan transformasi. Kajian berbentuk kuantitatif yang melibatkan 590 orang guru daripada 37 buah sekolah rendah di Barat Intermountain, Amerika Syarikat ini juga telah berjaya mendedahkan tingkah laku pemimpin yang boleh memberi impak yang besar kepada pencapaian akademik murid. Tingkah laku tersebut adalah memantau perkembangan murid, melindungi masa instruksional, menyediakan insentif kepada murid yang menunjukkan kejayaan dalam pembelajaran, menyediakan insentif kepada guru yang berjaya dalam proses pengajaran dan membuat *rewards contingent* iaitu tahap yang mana pemimpin mewujudkan transaksi yang produktif dengan pengikut mereka (salah satu dimensi dalam kepimpinan transaksi).



Kepimpinan instruksional juga sangat sesuai digunakan oleh sekolah yang perlu dipulihkan pencapaian akademik muridnya. Bickmore dan Dowell (2014) melaksanakan kajian kes secara perbandingan (*comparative case study*) terhadap dua buah sekolah piagam (*charter school*) di Amerika Syarikat. Tujuan kajian tersebut adalah untuk meneroka amalan kepemimpinan instruksional pemimpin dua buah sekolah berkenaan. Sekolah piagam merupakan satu program untuk memulihkan sekolah yang berprestasi rendah. Dapatan kajian ini mendedahkan bahawa pemimpin sekolah telah memberi tumpuan yang lebih terhadap kehendak kerajaan negeri yang mengawal sekolah mereka. Selain itu mereka juga mempunyai pengetahuan yang terhad dalam amalan pedagogi. Pemimpin sekolah juga mempunyai kesukaran menguruskan program berkaitan aspek pengajaran dan mengekalkan iklim sekolah yang positif. Keadaan ini mungkin berkait rapat dengan pengalaman memimpin yang terhad. Kesannya, kedua-dua pemimpin tersebut memberi tumpuan kepada perubahan struktur sekolah, mewakili isu-isu pengajaran kepada pemimpin pertengahan di sekolah, dan kelihatan amat bergantung kepada program komersial yang telah ditetapkan seperti *LEAP Coach books*, *Buckle Down LEAP books*, *Study Island*, and *Reading A to Z or RAZkids* berbanding dengan peningkatan amalan PdP guru dalam kelas.

Selain daripada prestasi pencapaian akademik murid, kajian mengenai kepemimpinan instruksional dan efikasi sendiri guru menjadi antara bidang penyelidikan yang dikaji oleh sarjana kepemimpinan. Menurut Shafinaz (2017) dalam kajian beliau mengenai hubungan antara kecerdasan emosi dan kepemimpinan instruksional pengetua dalam mempengaruhi efikasi sendiri guru di sekolah menengah di Negeri Sembilan mendapati bahawa kecerdasan emosi, kepemimpinan instruksional pengetua dan efikasi sendiri guru berada pada tahap yang tinggi secara keseluruhan bagi setiap dimensi yang diukur. Kajian ini juga menunjukkan bahawa terdapat hubungan yang signifikan secara statistik, positif dan sederhana kuat antara kecerdasan emosi pengetua dengan efikasi sendiri guru serta hubungan antara kepemimpinan instruksional pengetua dengan efikasi sendiri guru. Sebaliknya, hubungan yang signifikan secara statistik, positif dan kuat diperoleh antara kecerdasan emosi dengan kepemimpinan instruksional pengetua.

Masitah dan Khaidir (2015) turut mengaitkan kepemimpinan instruksional dengan efikasi sendiri guru berdasarkan persepsi guru. Kajian ini bertujuan mengenal pasti hubungan antara persepsi guru terhadap kepemimpinan instruksional pengetua mereka dan efikasi sendiri guru dalam melaksanakan pendidikan alam sekitar. Kajian ini melibatkan 300 orang guru daripada 30 buah sekolah menengah harian di Perlis yang mewakili Zon Utara Malaysia Barat, Selangor yang mewakili Zon Tengah Malaysia Barat, Pahang yang mewakili Zon Timur Malaysia Barat, Melaka yang mewakili Zon Selatan Malaysia Barat dan Sarawak yang mewakili Zon Malaysia Timur. Kajian kuantitatif ini dianalisis berdasarkan 263 daripada 283 set soal selidik yang berjaya dikembalikan. Dapatan kajian menunjukkan bahawa persepsi pengetua dan guru terhadap amalan kepemimpinan instruksional pengetua adalah berbeza. Pengetua menilai diri mereka melaksanakan kepemimpinan instruksional adalah tinggi manakala bagi guru pula mereka menilai tahap amalan pengetua mereka adalah sederhana. Selain itu, kajian ini juga membuktikan bahawa wujud hubungan yang signifikan antara amalan kepemimpinan instruksional dan efikasi sendiri guru dan perhubungan ini telah memberi pengaruh terhadap efikasi guru tersebut dalam melaksanakan pendidikan alam sekitar.

Di samping efikasi sendiri, bidang penyeliaan dan pembangunan kapasiti guru juga dijadikan skop kajian. Ibrahim, Sani, dan Rosemawati (2015) telah melaksanakan satu kajian empirikal dalam kalangan pengetua sekolah menengah harian di Selangor yang menganalisis pengaruh kepemimpinan instruksional terhadap bidang penyeliaan, kurikulum, efikasi sendiri

guru dan pembangunan kapasitas guru. Dapatan kajian menunjukkan kepemimpinan instruksional pengetua harus memberi tumpuan kepada pelaksanaan kurikulum dan membudayakan iklim PdP yang berkualiti. Dapatan kajian ini juga menyatakan aktiviti penyeliaan ialah sebahagian daripada tanggungjawab pemimpin instruksional. Kajian ini menunjukkan bahawa terdapat kesan positif kepemimpinan instruksional terhadap pencapaian akademik murid dan amalan kepemimpinan instruksional yang berkesan dapat dilihat hasilnya berdasarkan kecemerlangan sekolah. Jika kepemimpinan instruksional dilaksanakan secara berkesan maka sekolah juga akan berkesan. Selain itu, dapatan kajian ini juga menyokong hasil dapatan penyelidik-penyelidik terdahulu iaitu kepemimpinan instruksional mempunyai hubungan yang positif terhadap pencapaian dan kejayaan akademik murid berasaskan pembangunan kapasitas (Bell, Bolam, & Cubillo, 2003; Domsch, 2009; Leithwood *et al.*, 2004; Smith, 2009; Srinides, 2009).

Perbezaan pelaksanaan kepemimpinan instruksional oleh pemimpin sekolah lelaki dan pemimpin sekolah wanita turut menjadi isu yang dikaji. Hallinger *et al.*, (2016) melakukan kajian meta-analisis mengenai perbezaan pelaksanaan kepemimpinan instruksional dari segi jantina terhadap 2000 orang pemimpin sekolah dari tahun 1983 hingga 2014. Kajian berbentuk kuantitatif ini menggunakan 40 set data yang diambil daripada 28 buah kajian yang menggunakan soal selidik *Principal Instructional Management Rating Scale* (PIMRS). Daripada 40 set tersebut, 24 adalah daripada kajian sekolah rendah iaitu melibatkan kepemimpinan instruksional bagi kelompok guru besar. Dapatan kajian menunjukkan bahawa terdapat perbezaan yang signifikan dari segi jantina dalam melaksanakan kepemimpinan instruksional iaitu guru besar wanita terlibat lebih aktif dalam kepemimpinan instruksional berbanding guru besar lelaki.

Selain daripada faktor jantina, perbezaan pelaksanaan kepemimpinan instruksional oleh pemimpin sekolah rendah dan menengah turut dikaji. Gedik dan Bellibas (2015) telah menjalankan satu kajian untuk menilai perbezaan pelaksanaan amalan kepemimpinan instruksional pemimpin sekolah rendah dan menengah di Amerika Syarikat. Kajian ini bertujuan menghuraikan perbezaan asas pelaksanaan kepemimpinan instruksional di sekolah rendah dan menengah dengan membandingkan keputusan yang diperolehi daripada tinjauan "*Comprehensive Assessment of Leadership for Learning*" (CALL). Sebanyak 4311 orang guru, staf dan pentadbir sekolah terlibat dalam kajian ini. Dapatan kajian menunjukkan semua lima domain kepemimpinan instruksional yang dinilai melalui CALL mencatatkan nilai skor min yang sangat hampir antara satu sama lain. Ini menunjukkan bahawa tiada satu pun domain dalam kepemimpinan instruksional yang diabaikan sama ada di sekolah rendah atau menengah. Walau bagaimanapun, perbezaan pelaksanaan di sekolah rendah dan menengah adalah dari segi amalan kepemimpinan yang berkaitan dengan pemantauan aktiviti PdP. Pemimpin sekolah rendah didapati lebih terlibat dalam aktiviti memantau kerja harian guru dan kakitangan sekolah dan sentiasa berkomunikasi dengan mereka. Manakala pemimpin sekolah menengah pula lebih memberi tumpuan kepada hal berkaitan peruntukan sumber sekolah dan menjaga hubungan luar. Kecenderungan pemimpin sekolah menengah terhadap sumber sekolah dan hubungan luar ini didapati boleh mengurangkan motivasi dan potensi warga sekolah terutama guru untuk memberi tumpuan kepada aktiviti dalaman sekolah seperti keberkesanan aktiviti PdP, sedangkan kecenderungan pemimpin sekolah rendah pada aktiviti pemantauan kerja harian guru dan menitikberatkan hal komunikasi akan membuka ruang kepada warga sekolah untuk membincangkan isu-isu besar berkaitan PdP yang mana ini akan menyumbangkan kepada peningkatan prestasi akademik murid.

Kualiti pengajaran guru boleh ditambah baik dengan adanya pemimpin sekolah yang mengamalkan kepemimpinan instruksional. Yusri dan Aziz (2014) melaksanakan kajian

mengenai kepemimpinan instruksional pengetua dan kompetensi pengajaran guru. Kajian yang bertujuan membangunkan satu model gabungan dua entiti tersebut melibatkan 481 orang guru daripada 55 buah sekolah menengah harian di Terengganu. Dapatan daripada kajian ini telah berjaya membangunkan model kepemimpinan instruksional pengetua terhadap kompetensi pengajaran guru. Kajian ini juga telah menunjukkan bahawa kepemimpinan instruksional mempunyai hubungan positif dan menyumbang secara signifikan terhadap kualiti pengajaran guru.

Hubungan antara kepemimpinan instruksional dan kualiti pengajaran turut dipersetujui oleh Hallinger dan Lee (2013). Mereka telah mengkaji mengenai keupayaan pemimpin sekolah untuk melakukan reformasi terhadap kualiti PdP di Thailand dengan menggunakan pendekatan amalan kepemimpinan instruksional. Dapatan kajian menunjukkan bahawa dua dimensi kepemimpinan instruksional yang diasaskan oleh Hallinger (2011, 2000) iaitu mentakrif matlamat sekolah dan menggalakkan iklim sekolah dilaksanakan oleh pemimpin sekolah di Thailand adalah pada tahap sederhana manakala satu lagi dimensi iaitu mengurus program instruksional berada pada tahap yang rendah. Kajian ini juga mendapati bahawa kualiti pengajaran guru boleh dipertingkatkan sekiranya pemimpin sekolah mengamalkan kepemimpinan instruksional. Kajian kuantitatif berbentuk tinjauan yang dijalankan terhadap 1195 pemimpin sekolah rendah dan menengah ini juga menjadi bukti awal (*preliminary evidence*) yang membolehkan pelbagai strategi dilaksanakan oleh Kementerian Pendidikan Thailand bagi memastikan pemimpin sekolah mereka mempunyai ilmu pengetahuan, kemahiran dan motivasi untuk menyokong perubahan dalam reformasi pendidikan negara tersebut terutama dari segi menambah baik kualiti pengajaran guru.

Dimensi kepemimpinan instruksional boleh memberi kesan kepada sesebuah sekolah dari aspek kesihatan organisasi. Parlar dan Cansoy (2017) telah menjalankan kajian untuk meneliti hubungan antara tingkah laku kepemimpinan instruksional pentadbir sekolah dan kesihatan organisasi sekolah. Kajian ini melibatkan 538 orang guru yang bertugas di peringkat sekolah rendah, pertengahan dan tinggi di daerah Umraniye, Istanbul dan Soal Selidik Tingkah Laku Kepimpinan Instruksional Pemimpin Sekolah dan Inventori Kesihatan Organisasi digunakan sebagai instrumen kajian. Dapatan kajian ini menunjukkan pemimpin sekolah mengamalkan tingkah laku menentukan dan berkongsi objektif sekolah pada tahap yang paling tinggi. Kajian ini juga mendapati wujud korelasi yang positif dan signifikan antara dimensi tingkah laku kepemimpinan instruksional dan kesihatan organisasi sekolah. Semua dimensi kepemimpinan instruksional menjelaskan 49 peratus varians kesihatan organisasi. Sebaliknya, dalam kelima-lima dimensi tingkah laku kepemimpinan instruksional tersebut hanya dua sahaja iaitu menentukan dan berkongsi objektif sekolah dan membentuk persekitaran pembelajaran dan iklim sekolah yang positif yang menjadi peramal yang positif dan signifikan terhadap kesihatan organisasi sekolah.

Perbezaan persepsi antara guru dan pemimpin dalam menilai kepemimpinan instruksional pemimpin tersebut juga memberi kesan kepada budaya kolaboratif dalam kalangan guru. Park dan Ham (2016) telah menjalankan kajian mengenai percanggahan (*disagreement*) persepsi mengenai pelaksanaan kepemimpinan instruksional dalam kalangan pemimpin sekolah menengah harian di tiga buah negara Asia-Pasifik iaitu Australia, Korea Selatan dan Malaysia. Persepsi dalam kajian ini terbahagi kepada dua kategori iaitu persepsi pemimpin dan persepsi guru. Dapatan kajian menunjukkan wujud percanggahan yang signifikan antara persepsi guru dan pemimpin dalam menilai amalan kepemimpinan instruksional pemimpin tersebut. Hal ini kemudiannya memberi kesan yang negatif kerana mampu menghalang usaha untuk menjadikan organisasi sekolah sebagai tempat paling kondusif dalam membudayakan

aktiviti kolaboratif dalam kalangan guru. Dengan kata lain, guru akan lebih berminat untuk mempraktikkan amalan kolaboratif dan interaksi sesama mereka sekiranya percanggahan persepsi terhadap amalan kepimpinan instruksional pemimpin sekolah tersebut dalam kuantiti yang sangat kecil. Selain itu, didapati juga percanggahan persepsi ini jelas ketara berlaku secara tekal di tiga buah negara yang dikaji walaupun terdapat perbezaan yang besar dalam kalangan negara terbabit dari segi latar belakang sosio-budaya. Dapatan daripada kajian ini telah membuka mata banyak pihak untuk memberi tumpuan terhadap persetujuan pemimpin-guru dalam menilai pelaksanaan amalan kepimpinan instruksional kerana ia merupakan satu aspek penting dalam pembangunan sesebuah sekolah.

### 3.0 Penutup

Kepimpinan instruksional merupakan satu bentuk kepimpinan yang perlu diamalkan oleh setiap pemimpin sekolah bagi memacu kecemerlangan sesebuah sekolah. Kementerian Pendidikan Malaysia (KPM) telah menegaskan bahawa pemimpin sekolah perlu berperanan sebagai pemimpin instruksional yang terlibat secara aktif dalam pembangunan guru dengan cara merancang, menyelaras dan menilai proses pengajaran dan pembelajaran (PdP) di sekolah. Kajian-kajian literasi yang terhasil daripada kajian empirikal yang dijalankan didapati mampu untuk dijadikan panduan kepada setiap pemimpin sekolah atau warga pendidik agar memahami secara lebih mendalam mengenai kepimpinan instruksional dan isu-isu berkaitan pelaksanaan kepimpinan instruksional.

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# Effectiveness of Critical Thinking Intervention Module based on Teachers' Feedback

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## Abstract:

The purpose of this research is to analyze the feedbacks of preschool teachers about the effects on a designed critical thinking intervention module. The theories, elements, standards, and skills of critical thinking were integrated into the main course contents, and the effects of the intervention were examined. This research involves three preschool teacher candidates who took part in the intervention program. Teacher's feedback Form (TFF) was used to obtain the teachers' perspectives after the intervention program. The teachers have responded to 20 close-ended questions and 9 open-ended questions. The results indicated that preschool teachers were satisfied towards the intervention program with overall mean ( $M=3.75$ ,  $SD=0.32$ ). Overall, teachers were satisfied with the overall intervention program and commented that the intervention program was found feasible as it is appropriate, fun, attractive, easy to understand, effective, beneficial and practical.

**Keyword:** Preschool Teachers, Critical Thinking, Module

## 1.0 Introduction

Today, critical thinking lies at a prestigious position among many educational aims and ideal advocates by educators and educational theorists today (Siegel, 2010). The study of critical thinking has drawn the attention of educators, researchers, policy makers, professionals and researchers on infusing critical thinking skills in the curriculum (Bernard et al., 2008). Research has shown that critical thinking can be explicitly taught in the curriculum (Ritchhart, Church & Morrison 2005, 2008; Barahal 2008; Salmon 2010) and can be instilled in every level of education. A number of studies have found that it is good to develop good thinkers at the early age (Aubrey, Ghent & Kanira, 2012; Aizikovisth-Udi & Cheng, 2015, Birbili, 2013, Daniel, Gagnon & Pettier, 2012; Murphy, Rowe, Ramani & Silverman, 2014). The developmental process of critical thinking can begin as early as preschool (Daniel & Gagnon, 2011).

Young children are capable to involve in critical thinking, problem-solving and finding alternatives of situations (Davis-Seaver, Smith & Leflore, 2001). According to Willingham (2007), critical thinking is not just a set of skills but type of thinking that even 3-year-olds can engage in and dependent on domain knowledge and practice. Taggart *et al.*, (2005) have carried out a post-2000 literature review of thinking skills in the early years and mentioned that studies did show the benefits of teaching thinking in the early years. This also proves that children's flexibility and plasticity of thinking can happen during their preschool age (Alfonso-Benlliure et al., 2013). Hence, the most ideal time to start teaching thinking skills is in the early years education (Bailin et al., 1999; Aubrey et al., 2012; Wong & Yeo, 2014).



It is undeniable that critical thinking skills can be raised through the explicit teaching of thinking. There are a wide range of curriculum and program development on teaching thinking such as pioneered work by Feuerstein, Lipman and Edward De Bono. For instance, there are programs most rigorously evaluated such as cognitive acceleration through science education (CASE) and CA in mathematics education (CAME) (Aubrey et al., 2012). Swartz & McGuinness (2014) stated that the most successful interventions are associated with a strong theoretical underpinning, well-designed and contextualised materials, explicit pedagogy and teacher support. Research also showed that interventions seemed to work with strong theoretical framework and teachers were enthusiastic and well trained in the use of a programme or strategy (Fisher, 2005). Thus, researchers believe that critical thinking can be included in the preschool curriculum if critical thinking is taught explicitly with a module which is comprehensive with basic knowledge of critical thinking, method of delivery and instructional activities.

### **1.1 The purpose of the study**

In the present study, the feedbacks of prospective teachers toward the critical thinking intervention module were examined. Thus, the purpose of the study was to evaluate the feedback of teachers that involved in the intervention program. The research questions explored in this study were:

- (i) What are the teachers' perspectives in teaching critical thinking?
- (ii) What are the teachers' feelings throughout the program?
- (iii) What is the teachers' feedback on the teaching contents?
- (iv) What are the teachers' suggestions for future implementation?

## **2.0 Methodology**

The Teacher's Feedback Form (TFF) was distributed to three teachers after implementation of the critical thinking intervention program to collect their feedbacks for improvements and future direction of promoting critical thinking in schools. Feedbacks from teachers revealed their thought and experiences from the 16-week intervention program. TFF consists of 20 close-ended questions 9 open-ended questions. The close-ended questions were analysed quantitatively and presented as descriptive data. The open-ended questions were analysed qualitatively, categorised, and coded into themes and sub-themes. TFF was administered to the teachers 2 weeks after the intervention.

## **3.0 Findings**

### **3.1 TFF: Close-ended Questions**

Analysis of mean and standard deviation for each of the close-ended questions is presented in Table 1. These questions were developed with a Likert scale of 1–4, where each scale implied the following: 1-Strongly Disagree, 2-Disagree, 3-Agree and 4-Strongly Agree on each statement. Table 3.1 displays promising results with high mean scores ( $M$  greater than 3.00) for all close-ended questions listed in TFF. Teachers responded with 'strongly agree' in seven items ( $M=4.00$ ) and marked 'agree' with thirteen items in the TFF ( $M=3.67$ ,  $M=3.33$  and  $M=3.00$ ). Generally, the responses on every item in TFF were encouraging. The overall mean from the TFF was  $M=3.75$  with  $SD=0.32$ , thereby indicates the teachers' satisfactory reactions towards the ECTIM program.

**Table 1:** Descriptive Data on Teacher Feedback Form (TFF) for Close-Ended Questions

No.	Descriptions	<i>M</i>	<i>SD</i>
1	ECTIM was fun	3.67	0.58
2	ECTIM program was easy to understand	3.67	0.58
3	ECTIM program was attractive	3.67	0.58
4	ECTIM program was suitable for K2 preschool students	4.00	0.00
5	Students enjoyed the program	3.67	0.58
6	The contents were attractive	4.00	0.00
7	The contents were suitable for K2 preschool students	4.00	0.00
8	The program was beneficial for students	4.00	0.00
9	Students participated actively in the program	3.00	0.00
10	Students were able to work well with peers during group discussions	3.33	0.58
11	Students can follow the program well	3.67	0.58
12	Students like the activities in ECTIM	4.00	0.00
13	Students improved in applying critical thinking skills after ECTIM	3.67	0.58
14	Students were active in questioning during the ECTIM program	4.00	0.00
15	Students like the videos presented in the program	4.00	0.00
16	Students like the pictures presented in the program	4.00	0.00
17	ECTIM was effective to develop early critical thinking skills	3.67	0.58
18	I think it is feasible to implement ECTIM in my classroom	3.67	0.58
19	I think I will continue to adapt ECTIM in my classroom	3.67	0.58
20	Parents show support in the ECTIM program	3.67	0.58
	Overall Mean	3.75	0.32

### 3.2 TFF: Open-ended Questions

Nine open-ended questions were included in TFF in order to gain in depth understanding on teachers' feedback. Teachers' feedbacks are important testimonies which imply the effectiveness of ECTIM program and recognise further improvements to enhance practical outcomes in students' critical thinking skills. The following abbreviations were used to represent the source of extracted data in the discussion: T1 = Teacher 1, T2 = Teacher 2 and T3 = Teacher 3. The findings from the qualitative data and the teachers' feedbacks are recorded in Table 2.

**Table 2:** Teachers Responses Themes

No	Open-ended Questions	Theme	Sub-themes
1	In your opinion, is it important to teach critical thinking in preschool students? Why?	• Positive impression	<ul style="list-style-type: none"> <li>• Important</li> <li>• Develop new thinking skill</li> <li>• Improvement</li> <li>• Develop new knowledge</li> </ul>
2	How do you feel throughout the ECTIM program	• Positive feeling/emotion	<ul style="list-style-type: none"> <li>• Fun</li> <li>• Enjoy</li> <li>• Good</li> <li>• Impressive</li> <li>• Interesting</li> </ul>

3	What is your perception towards the teaching contents?	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Inclusive</li> </ul>	<ul style="list-style-type: none"> <li>• Learn new things</li> <li>• Practical</li> <li>• Creative</li> <li>• Clear</li> <li>• Well-defined</li> </ul>
4	Do you like this program? Why?	<ul style="list-style-type: none"> <li>• Positive emotion</li> <li>• Satisfaction</li> <li>• Perceive new knowledge and skill</li> </ul>	<ul style="list-style-type: none"> <li>• Agree</li> <li>• Learn new skill and knowledge</li> </ul>
6	Is this program effective to enhance students' critical thinking? Why?	<ul style="list-style-type: none"> <li>• Positive results</li> <li>• Transfer knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Ability to practice learnt skills</li> </ul>
7	Any positive effects shown in student's learning? Explain.	<ul style="list-style-type: none"> <li>• Positive results</li> <li>• Positive emotion</li> </ul>	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Enjoy</li> <li>• Happy</li> </ul>
8	Will you suggest on continuing to implement this program on the preschool students in future? Why?	<ul style="list-style-type: none"> <li>• Positive suggestions</li> </ul>	<ul style="list-style-type: none"> <li>• Agree</li> <li>• For future benefit</li> </ul>
9	Any other comments on this program?	<ul style="list-style-type: none"> <li>• Suggestions for improvement and future use</li> </ul>	<ul style="list-style-type: none"> <li>• Future improvement</li> <li>• More time for activities</li> </ul>

#### 4.0 Discussion

A module that supports teachers in teaching by outlining details of activities, examples, lesson plans, and suggestions is able to enhance the effectiveness of the module (Aliza, 2000). A successful module design depends on the interrelationship between these elements and deep engagement from students (Donnelly & Fitzmaurice, 2005). From the findings, teachers' feedbacks were remarkably positive towards the program. They agreed that this program was important for the students to perceive the precise thinking skills. They have positive impressions on the intervention program that will benefit students to equip their critical thinking skills with the designed module. Teachers declared that program was indeed fun, interesting and very much enjoyed by students. Additionally, it gave students opportunities to learn new things by participating in group discussions and activities. Teachers also commented that they learnt new skills in teaching as well; that is, a systematic approach to help students think more critically besides using new teaching tools which can be applied in other subjects, in order to stimulate students' thinking. Teachers felt that the contents were well-defined, clear, effective and practical with numerous activities to boost students' confidence in sharing their opinions and ideas. It was interesting to find out that the students shown positive emotion and result from the intervention program. Teachers commented that the students are happy and enjoy throughout the program. Suggestions for improvements from teachers were taken for future improvement or research. Teachers suggested having more activities or worksheets related to thinking skills which can prepare the students to enter primary school. Students also need to be given opportunity to apply their thinking skills by conducting various activities related to thinking. They also suggested that the program can be conducted as a single subject so they can have more time and focus on teaching thinking skills.

## 5.0 Conclusion

This study analyses feedbacks from teachers based on the close-ended and open-ended questions in TFF. Overall, teachers were satisfied with the intervention program and commented that it was feasible, fun, attractive and appropriate. Based on the teachers' feedback, the intervention program was effective in enhancing students' critical thinking skills. Nevertheless, further research is needed to examine different level of schools, larger participants and other thinking skills. This study was limited to the critical thinking skill, but further studies about other thinking skills such as, creative thinking or analytical thinking can be conducted.

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# **The Impact of Village Expansion Policy on Public Service Aspects at Sadar Village Bone-Bone District of North Luwu Regency**

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## **Abstract:**

This research explores the impact of village expansion policy on public service aspects at Sadar Village of Bone Bone District of North Luwu Regency. This study aims at to determine the impact of village expansions policy on public service aspects at Sadar Village Bone-Bone District, North Luwu Regency. The type of research is descriptive with qualitative approach. Data collection techniques through interviews, observation, and review documentation. Data analysis techniques used consist of; data collection, reduction, data display, and drawing conclusion. The results showed that the impact of village expansion policy which occurred at Sadar Village of Bone-Bone District of North Luwu Regency has had a positive impact on the public service aspect, especially in the service of Birth Certificate and Family Card that has been seen from several indicators namely; system/procedures, service period, cost/tariff, facilities and infrastructure, and apparatus competency. According to the results of the study showed that village expansion of Sadar Village has very positive impact on public services in this area, because it brings a better change rather than before the village expansion is done. In other words, the expanding territory of Sadar Village has fulfilled the expectation of all the people of Sadar Village who need a quality service.

**Keywords:** Policy, village expansions, various aspects of village expansion, the impact of village expansion

## **1.0 Introduction**

Regional autonomy based on the Law No. 23 Year 2014 about regional governmental refers to the right, authority, and obligation of autonomous regions to regulate and manage their own governmental affairs and the interests of local communities in accordance with the laws and regulations. As talking about the issue of regional autonomy will not be divided with the autonomous region (Anderson & Costa, 2016; Bayramov & Nolan, 2017; Charron, Dijkstra, & Lapuente, 2015; Heberer, 2017). The autonomous region, in this case referring to as the region of a legal community unity that has territorial boundaries that have authorizations to regulate and manage government affairs and the interests of local people according to their own initiative based on the aspirations of the people in the system of the Unitary State of the Republic of Indonesia (Salam, Rosdiana, Suarlin, & Akib, 2014). Theoretically, keywords in autonomy mean decentralization as well. Decentralization is defined as the transfer of government authority by the central government to the autonomous regions to regulate and organizing the government affairs within the system of the Unitary State of Republic of Indonesia.

Actually, beside the effectuation of regional autonomy as the constitutional mandate, nowadays, it is also an objective requirement for the central government. In fulfilling the objective needs, the implementation of regional autonomy is expected to make the administration much better, efficient, effective, encouraging in empowering the community, developing equitable and fair life and able to increase community participation in regional development. Moreover, the existence of regional autonomy is also expected to get an open opportunities further for each region to explore and empower the potential of the region, and provide flexibility for the region to manage its own government affairs.

When the enactment of Law No. 32 year 2004 about Regional Government is essentially directed to accelerate the realization of community health through improving services, empowerment and community participation in the implementation of development. In line with these expectations, in order to improve the acceleration and quality of local government in accordance with the soul and spirits of regional autonomy as stipulated in the Law No. 32 year 2004, so then it is seemed very necessary to conduct the expansion of the region either in regencies/ cities, districts or villages.

According to the Government Act of Republic of Indonesia No. 78 year 2007 concerning the establishment procedures, elimination, and merger of regions, the expansion of regions is the splitting of provinces or regencies/cities into two or more regions. The latest legal basis for regional expansion in Indonesia is that Law No. 23 year 2014 as a revision from the Law No. 32 year 2004 about Regional Governmental. The regions expansion policy is the one strategic of the concrete forms of decentralization and regional autonomy policy. It is one of the main steps chosen by the central government to improve the quality of the implementation of government duties in the context of public service, empowerment, and making an advanced societal development, independence, prosperity, fairly and prosperous.

The expansion of region is intended to make the process of government administration in the field of public services and regional development can be more equitable, sustainable and can reach all levels of society. Moreover, the expansion of the region is also intended to facilitate the government's control opportunities to the communities and facilitate public communication towards on the government (Hernawan, Salam, Haerul, & Suprianto, 2017; Salam & Rosdiana, 2016). The expansion policy has led to a pro and contra attitude in various circles of politicians, public figures, government officials, and among the experts. They debate the benefits or losses arising from the many areas that are split. Various opinions were shared by the community, some argued that expansion territory was carried out solely for obtaining funds either from the central government or from the local government, but also an allegation that expansion was a business among elites in the region who wanted a position or position of the division. On the other hand, however, there are many opinions that support the existence of this expansion policy, because It has provided an opportunity to the regions in managing their respective regions, in addition to the expansions can also shorten the range of government control in controlling the community.

In related to this case, there are two previous studies that discuss the issues about the expansion areas, is that research conducted by Zakarudin (2013) by the title of research: "The impact of expansion in availability of Societal facilities and infrastructure of Waturempe Village, Tikep District of Muna Regency". This study used a descriptive approach. From the results of his research showed that expansion territory did not have a significant impact on the availability of societal facilities and infrastructures that can be seen from the absence of good road facilities, water facilities that are not comparable with the

level of community needs, electricity network has not been built until now, traditional markets that do not operate thereby impeding the flow of playback of goods and services. There were some determinants influenced the village expansion did not have impact on Waturampe Village, such as; (1) geographic conditions, (2) lacking of Village Government initiatives in the management of its affairs, (3) Political tendency at the post district elections, (4) Lacking of village original revenue, and (5) Limited resources of the district government.

Another study has been carried out by Khair (2017) with the title of his research: "Village Expansion in terms of autonomy aspects ". This research used a qualitative descriptive approach. From the results of the research showed that there were three stages of the process of expansion of Wanasari Village, Angkona District, East Luwu District revealed at the first stage, the process of collecting aspirations where people sit together to conduct a deliberation to reach an agreement to unfold. The second stage, the formation of the expansion committee that was getting the agreement to split the community determine the village expansion committee in making the charge of proposals for the expansion of the Regent (Bupati). The third stage is the process of Regional Regulation Drafting (Raperda).

Based on the two results of this study illustrates that the expansion policy of village comes from the aspirations of people who want to the creation of regions to get a better quality of life. Although basically the purpose of the expansion is to improve the quality of life of the community, but frequently, it seemed have a positive impact on quality of life that is contrasted to the two previous studies, the focus of research on current researchers is the impact of the policy of village expansion on the aspect of public service about the service of Birth Certificate and Family Card.

As the time change, there are many demands of the public to obtain better public services and welfare, especially as perceived by the community of Sadar Village whom really need to have an region expansion. Sadar Village is a village of fractions from Tamuku Village. Before being expanded, Tamuku Village has an area of 10,2 kilometers with a population of 3.784 people, consisting of 810 Family Heads (KK), and is divided into four hamlets (Dusun), namely; Dusun Tamuku, Dusun Kembang Makmur, Dusun Walero, and Dusun Sadar. After splitting, Tamuku Village has a population of 2.308 people, consisting of 406 families, and is divided into four Dusun, Dusun Tamuku, Dusun Kembang Makmur, Dusun Tanatako, and Dusun Tondokura.

The result of expansions from Tamuku Village is Sadar Village. Sadar Village was inaugurated on October 1, 2012 by Luwu Utara Regent Drs. Arifin Junaidi, M.M. This village stands with the Local Regulation of Luwu Utara Regency No. 2 of 2012 about the Establishment of Sadar Village of Bone-Bone and Sumpira Village of Baebunta District. Sadar Village has amount of population is 1.475 people, consisting of 404 Head of Family (KK), and is divided into four Dusun (hamlet) namely, Dusun Sadar, Dusun Walero, Dusun Tetelangka, and Dusun Sappa.

As before it expanded into the village of Tamuku as its parent village, Sadar Village was the one area of the hamlet (dusun) that is located on the scope of Tamuku Village. Government office centered in the village of Tamuku involving the span of government control over the people of the village of Sadar when it is quite far, it affects the interaction between the community of Sadar village with the village government, so that government services to the community Sadar Village in terms of public services, especially in the field of



administration residence services such as; birth certificate and family card become less optimal.

By the expansion policy of this village, it is hoped that the community can easily receive the best service from the Village Apparatus especially in giving the service of Birth Certificate and Family Card. Besides that, it is also expected that the development of village infrastructure can be more evenly distributed at Sadar Village because in the essence the good infrastructure will contribute to the economic growth of the rural community.

Based on the above description, the authors conducted further research used the research title is that "Impact of Village Expansion Policy on public service aspect at Sadar Village of Bone-Bone District of North Luwu Regency".

## **2.0 Research Method**

The type of this research is descriptive. The reason why researcher is used descriptive one, because in doing the research, the researcher involves populations and individuals as a limited source of data, meanwhile the problems which have to be investigated are very deeply. The sources of data in this study obtained from books, documents, archival records, communities and village government institution making interviews at Sadar village, and also doing direct observation to this region, participant observation, and used physical device. In the context of collecting some data that coming from these various sources, so then, the results of the research will become clearer. The type of this study selected by the researchers also aims at to illustrate lightly the impact of expansion village that will be generated to the village expansion on the public service aspects that focus to the Birth Certificate Service and Family Card at the Sadar Village of Bone-Bone District of North Luwu Regency. The researcher wants to know more about how far the impact of conscious village fairly policy on the system and procedures, service periods, cost/tariff, facilities and infrastructure and apparatus competence on service of Birth Certificate and Family Card at the Sadar Village.

### **2.1 Research Location**

The location of the research in this study that is at the Sadar Village Bone-Bone District of North Luwu Regency which is one of the expansion village has been done. Based on the Local Regulation of Luwu Utara Regency No. 2 of 2012 on the Establishment of Village of Bone-Bone District and Sumpiran Village of Baebunta District. The reason why the researcher chooses the conscious Village as a research location because Sadar Village is one of the villages that has long desired the expansion of the village, and after the expansion the researcher wants to know how far is the impact of the expansion of the village especially the impact on public service at Sadar Village.

### **2.2 Research focus**

The research focus applied in this research is on Birth Certificate Service and Family Card at Sadar Village Office of Bone-Bone District by considering the following of five indicators such as: system/procedure, service period, cost/tariff, facilities and infrastructures, and the apparatus competencies.

### **2.3 Description of Research Focus**

The research focus of description will be discussing about the impact of village expansion policies on the public service aspects concerning on the Birth Certificate Services and Family Card by covering indicators such as System/ Procedures, service period, cost/tariff, facilities and infrastructure, and also apparatus competencies.

### **2.4 Data source**

Sources of data in this study are the responds and actions of the informants as the primary data, writing or documents that support the statement of informants. Sources of data in this study there are two kinds that is called primary and secondary data. This data are needed to obtain relevant information to the purpose of research.

### **2.5 Data collection technique**

Methods of data collection is a researcher' ways to get the necessary data as in holding on the research from sources of data. In this research, the researcher used the research methods are as follows:

- a. Observation
- b. Interview
- c. Documentation

### **2.6 Testing and Data Validity**

Validation of data in conducting research is a way to achieve the credibility of a researcher by performing the following steps:

#### **a) Data Triangulation**

Triangulation of data is done by comparing data of first interview result with result of subsequent interview from informant in Sadar Village Bone-Bone District of North Luwu Regency. Information that is considered equally and appropriate with the informants that will be selected and then drawing conclusions.

#### **b) Member Check**

The member check is done at the end of the interview by repeating broadly the answers or views as data, based on the researcher's notes on what the informant statements. It is needed to be done, so then the informants can correct their statements which have not suitable according to their perceptions, reduce or add informations that was still less enough. If the data found agreed by the informants, and then it can be said that the data have been good validity.

### **2.7 Data analysis technique**

Data analysis technique is the process of reviewing all available data from various sources, such as interviews, observations, official documents, and images or photographs that have been obtained in the field during the study. Data analysis in qualitative research

conducted since before entering field, during field, and after finished in field. The way of data analysis in this method is as follows:

a) Data Reduction

Data reduction is a form of analysis that is summarizing, classifying and directing data research results at Sadar Village. It also a way to remove things that are considered unnecessary in this study. Thus, the data obtained by researchers from the results of research in the field after reducing it, so then It will provide information or a clearer picture, making it easier for researchers to perform further data collection.

b) Data Display

Presentation of data in this context is a collection of information that has been compiled which allows the conclusion and the taking of action. In order to present the presentation of data will help researchers understand about what happened and what then researchers should do next research. The most common form of data presentation in qualitative research is narrative text, graph, matrix and chart.

c) Drawing Conclusion/Verification

At this stage the conclusions of the conclusions are also verified during the research. The significance arising from data must always be tested for its correctness and conformity so that the validity is assured. In this stage, the researcher formulates the proposition related to the principle of logics, raises it as a research finding, then proceeds by repeatedly reviewing the existing data, the grouping of established data, and also give the proposition that has been formulated. The next step is to report the results of a complete study, with new findings different from the existing findings.

### **3.0 Result**

#### **3.1 System/procedures**

System or procedures are a way for people to get public services. In good public service, the simplicity of procedures is needed, because it will have benefits for the community. A faster handling the problems, correct and no convoluted way of dealing is a matter that people need in doing public service. In Sadar Village itself, the procedure applied by the government apparatus of Sadar village became one example that so-called simplicity of procedures. The simplicity of procedures which carried out by the Sadar village government officials to the community in the form of easy communication system between officials to the community that can be done anywhere without having a formally by arriving into the village office, although it has been in outside of government officials' office hours. This is a policy given by Sadar village government officials to their people who want to need a public services such as; taking care of birth certificates and family cards, and ensure that this policy received a positive response from the community, because it will ultimately provide convenience to the public to get public service which has not a kind of service based-complicated. Moreover, this simplicity is one of several positive impacts arising from the expansion of the village on the public service process.

#### **3.2 Time period**

Duration of service is a grace period required by the service provider to the recipient of service. Each service agency should have a clear time certainty in providing services to recipients of services. The Sadar Village Government Apparatus have not been able to provide certainty of services to the public due to the process of handling birth certificates and family cards of many parties involved. Not only village government apparatus, but also involving parties on it, and districts to complete one birth certificate and family card. Nevertheless, according to the researchers should the Sadar village government apparatus can provide certainty of time to the public in order to gain the trust of the community.

### ***3.3 Cost or Tariffs***

Cost or tariffs are the fees charged to the recipient of services in obtaining the services of the service providers. In Sadar Village, basically government officials do not specify or charge a fee to the public who want to do public service. But It is not infrequently taking people also to spend the cost at the time of service management. Just as birth certificates and family cards are issued, people who want to take care of birth certificates and family cards will be charged a fee of Rp 50,000 to Rp 100,000. This fee is used for transportation costs for Sadar Village government officials who help the community take care of birth certificates and cards families in the District Office and at the district population office. According to some informants, the amount of expenses incurred by the community is better when compared to when the Sadar Village has not been expanded from the parent village.

### ***3.4 Facilities and infrastructure***

Facilities and infrastructure is everything that can be used as a support tool in achieving a goal. The availability of adequate facilities and infrastructure will help the public service process be better. The main function of facilities and infrastructure is to speed up the service process, deliver higher quality work, provide comfort and create a sense of satisfaction for people who need service. In the Sadar Village Office itself, the availability of the required facilities has not been fully met. Only visible tables, chairs and MCK (Bath, Wash, Toilets) shower, brush, and facilities that have been available at Sadar Village Office. This is because the Sadar Village Apparatus are currently in the process of development after the expansion. However, It is not an obstacle for the community to get the satisfaction of service from the Sadar village government apparatus and feeling comfortable while they were staying at Sadar Village Office.

### ***3.5 Apparatus Competencies***

Personnel competence is a capability possessed by the Sadar village government apparatus in providing services to the public service in order to realize a quality public service. Competence of apparatus in this case include the skills, responsiveness and friendliness of the government apparatus of Sadar Village during the process of service to their society. As viewed from human resources, village government officials are aware of the newly formed Human Resources and have never done any training during the post-expansion village. However, the performance of the government apparatus of Sadar village in the good categories which it is felt by the community, so that It can be said as the one proof that the village government apparatus of Sadar Village Government new human source has the ability and the reliable responsiveness even without any training from the central government. In addition, good skills and responsiveness, the Sadar village government

apparatus have hospitality that should be emulated by other government apparatus. Competence of apparatus is the one element that is needed by the community to build the village, especially the newly created village to realize the excellent public service in society.

#### 4.0 Conclusion

The impact of village expansion policy on birth certificate service seen from several indicators of service standard component such as; system/procedures, service period, cost / tariff, facilities and infrastructure and executing competency have positive impact for the community, and then the kind of facilities and infrastructures are unavailable at Sadar Village government office is very minimal because at this time, Sadar Village Office is still in development stage, but it does not affect the service process of Birth Certificate in Sadar Village. The impact of the policy of village expansion on the Family Card service in the Village Office that has been seen from some indicators of component service standards are not much different from the service of Birth Certificate. The impact of this expansion policy has had a positive impact on the service of the Birth Certificate. Consequently, the post is expanded from the parent village, the entire community in the village of Sadar has a Family Card. This is one of the positive impacts of the expansion of Sadar Village for the public service, especially the Family Card service.

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# **Implementation of Environmental Education by Using Script Model EDS-AV**

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## **Abstract:**

The urgency of environmental education is to develop environmentally friendly attitudes and behaviors. In early childhood, a learning process is needed that involves the interaction between the child, the teacher, the parents of the learners, and the learning resources. This study reveals the stages of developing a learning model that combines environmental, educational and social competence concepts. Approach used audio visual script. The learning model of environmental education in early childhood is developed with attention to 4 aspects of education, develop, society and audio-visual. Education aspect aims to foster positive habits early on in maintaining the environment. Developing aspect aims to develop environmental themes with technological support and visualization in a short film that lasts a maximum of 30 minutes. Society aspect aims to develop community involvement to help learners to recognize the environment. Audio-Visual refers to the senses that are being targeted from the learning model. Audio-visual products can be a media documentation and can also be a medium of communication.

**Keywords:** Environmental, education, develop, society, and audio-visual

## **1.0 Introduction**

Environmental education is the process of creating character and behavior in understanding, developing and training people in preserving the environment. Environmental education is not only provided for school-aged children and is also provided for early childhood. A learning model for early childhood to be able to simulate the developmental aspects of children simultaneously. Early childhood education model is fundamental to childhood development. The importance is related to the most critical phases of intellectual growth and the overall psychic skill (golden age).

Early childhood develops their thinking skills and problem-solving by experiences interpretation. Learning process helps them to bring about the achievement of the competence of learners in the beginning class. Furthermore, the formation of creativity through the giving of some activities in a natural atmosphere is the education by the learners' experiences. The integration of various subjects presents the packaging of materials and learning procedures that come from the natural conditions as they occur in the learner's environment. Facts and events do not stand alone, but rather a phenomenon arising from the interrelationship between a fact or event with facts or other events. Smilansky, (1968), reveals that young children learn through their senses and physical contact with their environment.

The content of environmental education materials is not an easy thing to understand by kindergarten students. During this time there are many obstacles faced to apply the concepts

of environmental education in early childhood. Learning model that is designed with the concept of learning while playing is not considered to grow environmental awareness for children. Learning activities involve hands-on experience for children and provide various information or understanding about the environment around the child. This activity also provides opportunities for children to develop further skills such as controlling exceptional motor skills, observing, comparing, summarizing, remembering, counting, role-playing as well as exploring ideas.

## **2.0 Theoretical Review**

The theoretical review is explained in details as follows.

### **2.1 *Environmental Education Concept***

Environmental Education is a process to build a human population in a world that is aware and concerned about the total environment and all its related problems. The awareness can emerge with environmental knowledge or the ability to solve current environmental problems, and prevent new problems, (Arcury, 1990).

Neal & Palmer, (2003) explains that environmental education becomes one of the reasonable alternatives to incorporate environmental education into the curriculum. Environmental Education is directed to the importance of the attitude and behavior of learners to understand the importance of the environment for life and how to love and protect the environment into a value that is embedded in their daily lives. Environmental Education as one of the materials taught at an early age in this case. Kindergarten program aims to form a harmonious person by paying attention to the needs of children's development in achieving intrapersonal, visual, spatial, musical and intelligence. The student reativity and their spiritual intelligence also are the part of learning goal.

### **2.2 *Learning Strategies for Early Childhood***

There are various studies on the nature of early childhood. Child is unique and expresses his behavior relatively spontaneously. Besides that the child is active and energetic. In the planning of early childhood learning strategies, teachers should consider several important factors, namely: a. Characteristics of learning objectives, b. Characteristics of children and how to learn, c. Place of learning activity, d. Theme of learning, and e. pattern of activities (Leong & Bodrova, 1996).

Piaget & Cook revealed that the intelligence of the child develops through an active learning process by giving the child the opportunity to be seen actively in activities that can optimize the use of all the five senses of the child.

Paul (1971); Craig (2005), argues that man can not produce his knowledge of himself. At birth, humans are like new, unfilled white papers. There is no idea inherited by God, no idea of moral truth and goodness, even innate tendencies or habits. The reason is still empty, but in that negative situation, man realizes that he can not produce something useful for his existence. In an attempt to manifest that existence, the man begins to establish contact with the surrounding environment and establish in him the experiences of each object he faces. Consequently, human reason begins to fill and he becomes a rational person.

Salovey & Mayer, (1990) emotional intelligence is the ability to recognize, process, and control emotions so that children can respond positively to any condition that stimulates the emergence of these emotions. The environment, in general, provides challenges for children to pass. Its utilization will enable the child to develop positive self-esteem. For example, if a child is invited to a park with several trees that allow them to climb, climbing the tree raises the aspect of courage as part of developing the emotional aspect. The self-esteem that the child has for himself and others is developed through real-life experiences. The environment itself provides facilities for the child to get real-life experience.

Children learn through direct interaction with objects or ideas. The environment offers teachers the opportunity to reinforce concepts such as colors, numbers, shapes, and sizes. Utilizing the environment is mainly explaining.

Specific concepts naturally. The concept of color that is known and understood by the child in the class will be more real if the teacher directs the children to see the concept of real color that exist in the environment. Similarly, several things related to the impact of environmental utilization on aspects of child development. However, teachers should also have the knowledge, skills, and skills in developing children's learning by utilizing the environment as a source of learning.

### **3.0 Research Method**

The development of EDS-AV learning model is done with Four D that consists of 4 development stages: Define, Design, Develop, and Disseminate.

The defining stage is: The defining stage is the stage for defining and defining the learning conditions. This define stage includes five necessary steps, front-end analysis, learner analysis, task analysis, concept analysis and specifying instructional objectives.

Design stage aims to design learning tools. The four steps to be taken at this stage are: firstly, the compilation of the test standard (criterion-test construction). Secondly is the selection of the media (selection) in accordance with the material characteristics and learning objectives. Thirdly is the selection of the format ), i.e. reviewing the existing teaching material formats and specifying the format of the instructional material to be developed,. The fourthly is making the initial design according to the selected format.

The stage of development is the stage to produce the final form of learning device. This stage is done by two steps, namely: (1) expert appraisal followed by revision, (2) developmental testing.

The stage of dissemination as the final stage of development is the stage of utilization of media by the user.

### **4.0 Result**

The defining stage produces an environmental education concept that has been applied to the kindergarten. In the definition obtained learning materials and learning media. The initial information found from written information in syllabus and result of an interview with a teacher at kindergarten school. The researcher concluded that the topic divided into three categories that are self-health, environmental health, and environmental recognition.



- (a) Environmental health is made in the theme of "dumping."
- (b) Self-health is made in the theme of "brushing your teeth."
- (c) The introduction of the environment is made in Theme "planting a tree in a pot."

Specifically, the results of the invention of the material are described in Table 1.

**Table 1:** Themes and sub-material

<b>Thema</b>	<b>Sub Thema</b>
Throw Garbage Habit	a. Introducing the waste characteristics and disposal methods, b. Introducing solid waste management (collection, transportation, and disposal methods) c. Introducing the concept Reduce – Reuse and Recycle programs to achieve zero waste programs,
Self Hygiene	The habit of brushing teeth, bathing, cleanliness of nails and hair, tidiness of clothes
Environmental maintenance	Plant flowers and keep the environment clean

Initially, information also found that teacher used limited learning media. The media is less attractive and did not develop the creativity of children. The facilities available at school were potential to develop the learning strategies. Schools provided facilities video, computer, and television as a media of learning.

#### 4.1 Design

The learning model developed is a script-oriented or a story that is packed in a short film (video). The reason for choosing the movie story can add skills (psychomotor) and understanding (cognitive) of children in the environment.

This research produces a device in the form of short film scripts oriented to education/learning (Education), development (Develop), and society (Society) that can be heard and seen (Audio Visual). The steps are systematically conducted in two stages, namely pre-development stage (research) and development stage (develop). The stages are described in the following:

- a. Description of learning materials

Learning material were developed based on the kindergarten curriculum (Table 2)

**Table 2:** Learning materials

<b>No.</b>	<b>Thema</b>	<b>Time Allocation (weeks)</b>
1	Myself (Me and the five senses)	3
2	My surroundings (My family, my house, and my school)	4
3	My needs (Food, drink, and clothing)	4
4	Animals	3
5	Planting	3
6	Recreation (Vehicles, coast, and mountain)	4
7	Employment	3
8	Water, air, and fire	2

9	Communication Tools	2
10	My homeland (my country, life in the city and the village)	3
11	The universe (sun, moon, stars, earth, sky, and natural phenomena)	3

- b. Design of media
- Draft script design
  - The script design (short movie script)
  - Player design
  - Audio design
  - Visual design
  - Editing and evaluation process

#### 4.2 Develop

The results of the script are checked by media and material experts as a validation of the 3learning model. The results of the examination of media experts are presented in Table 3 and Table 4

**Tabel 3:** Description of media validation

No	Aspect	Component
1	Prolog	Location of shooting and school atmosphere
2	Voice Quality	video sounds, music sounds; Narrative and dialog text in scripts.
3	Visual Quality	i) animation; ii) Writing, and iii) Colour
4	Visual Communication	The format of learning Video Program

**Tabel 4:** Description of learning model validation

No	Aspect	Component
1	Material reasonable	Relevance of material with the competence of early childhood The story presented can strengthen the child's memory Topics discussed by the ability of early childhood Material difficulty level Conformity Script with material Aspects of learning that include cognitive, psychomotor and affective
2	Aspect of Language	Clarity of the usage of script instructions Use of language appropriate to audience Use of polite language
3	Feasibility of presentation	Presentation of the material encourages learners to be actively involved in learning, Presentation of figures in the script exciting and proportional, The storyline presented in the form of Audio Visual support the ease of the reader to understand the material
4	Visual Communication	Script Based Serving; Learning format

### 4.3 Disseminate

Dissemination is the application of learning model on one kindergarten. This test is done by looking at students' responses at the time of learning and the knowledge (table 5 and Table 6)

**Table 5:** Results of student response test

No	Expression	Percentage student with respond(%)	Percentage student with no respond(%)
	Pleasure	<b>61.90</b>	<b>38.10</b>
1.	Smiling	66.67	33.33
2.	Laughing	66.67	33.33
3.	Applause	66.67	33.33
4.	Cheerfully	55.56	44.44
5.	Dancing	55.56	44.44
6.	Singing	66.67	33.33
7.	Shouting joyfully (hore, yeah)	55.56	44.44
	Satisfaction	<b>40.74</b>	<b>59.26</b>
1.	Saying Words (alhamdulillah, yeah/yes)	66.67	33.33
2.	Thumbs up	11.11	88.89
3.	Raised hands up	44.44	55.56

**Table 6:** Result of student knowledge

No	Knowledge	Category
1.	Knowledge how to throw the garbage	Good
2.	Knowledge about garbage	Good
3.	Knowledge about the waste	Good
4.	Knowledge about wet garbage	Good
5.	Knowledge of waste separation	Good
6.	Knowledge about the fertilizer	Good
7	Knowledge about how to wash hands properly	Good

Previous studies that fit this learner model revealed that the habit of children who like to watch TV. Similar studies show that over the weekend 12% of boys and 8% of girls and 30% watch television for more than two hours each day. Children have nearly five times more habits than their parents who spend about two hours of television over the weekend (Rubin, 1979).

EDS-AV learning model is considered useful to increase the interest of kindergarten students to follow the lesson. The learning activities with happy and satisfied student responses after following the learning video is the fact of benefit of media. Also, students' knowledge of the environment is also good. With this in mind, this learning model can be applied to early learning.

## 5.0 Conclusion

Implementation of environmental education with EDS-AV script model one of the development outcomes for learning with the concept of education, development, and social community. The concept of education refers to learning and teaching process. Development concept refers to the production processes of material and learning strategies especially visual learning media for early childhood. Society concept has meant that all learner has the same interest in achieving common goals in a social relationship.

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# Use of Experimental Method of Effect on Student Learning Activity at Lesson of Natural Science

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## Abstract:

The problem in this research is the lack of active learning of students on natural science subjects Inpres Toddopuli I Kecamatan Panakkukang Makassar City. The formulation of the problem in this research is (1) How is the description of the experimental method on the students' learning activity on the subject of natural science (2) What is the description of the students' learning activity after the experimental method used on the subject of natural science and (3) Is there any influence of the experimental method on students' learning activeness on the subject of natural science. The approach of this research is quantitative approach with experimental research type. The variables of this research are independent variable or experimental method contained in the experimental object which is given symbol (X) and dependent (dependent) or student learning activity on the subject of science which is given symbol (Y). The research design used is pretest-posttest control group design. The population in this study were all students of class IVA and class IVB which amounted to 81 people. The sample of this research is class IVA and class IVB which become experiment class and control class with stratified random sampling technique. Data collection techniques used are observation, questionnaires and documentation. Data analysis techniques with descriptive statistical analysis and inferential statistics. The result of the research shows that (1) description of difference seen from learning activeness by using student experiment method is very enthusiastic in following teaching and learning process while student learning activity using direct learning is lower (2) Student learning activity using experiment method is in good category and liveliness of student learning by using direct or conventional learning is in enough category (3) Experimental method have a significant effect on student learning activity on science subject.

**Keywords:** Experimental method, direct learning, Activity learning, elementary school students, dependent variable and independent variable

## 1.0 Introduction

The rapid development of technology in the current era of globalization has provided many benefits in the progress of various social aspects. The development of this technology must also be followed by the development of Human Resources. Human adaptation to new technologies that have been developed must be done through education. (Conley & Udry, 2010). This is done so that future generations are not left behind in the case of new technology. Education is an effective means of supporting the development and improvement of human resources towards a more positive direction. The progress of a nation depends on qualified human resources, where it is largely determined by education.

Education science natural knowledge emphasizes the provision of experience directly to develop the competence so that students are able to explore and understand the nature

around scientifically (Golinski, 2008). In learning science natural science is needed skills of an educator or teacher in delivering teaching materials so that students can easily understand the material presented. (Lawson, 1989). In addition natural science is also known as theoretical knowledge obtained by a special method.(Chisholm & Scheffler, 1966) .

The subjects of in Elementary School is one of the learning programs that aims to develop curiosity, positive attitude and awareness about the relationship of mutual influence between natural science, environment, technology and society and can solve problems and make related decisions with everyday life. The importance of education for students is a second component of education that is not less important in determining the success of the learning process that requires teachers to perform functions and roles well. The success of a student in learning can be seen from the liveliness and student learning achievement in question. One of the capabilities that must be owned by an educator or teacher is how to manage the learning process so that learning objectives can be achieved as much as possible. Therefore, a teacher is required to hold a renewal in the learning process, especially in Learning Natural Science Science. But the liveliness of learning that became the benchmark of success, is still far from being expected.

The learning process has a negative impact on the students, among them: (1) students are less concerned about teacher explanation; (2) students lacking in conducting the experimental process; (3) students feel saturated and less attention to the teacher when explaining; (4) students play around in the learning process; and (5) passive students in learning activities in the learning process, of course, a teacher does not want to give a bad impact on the students. Every teacher wants a fun and student-centered learning process.

One of the learning that can give opportunity to student to be actively involved in learning process that is through experiment method. According to last research that: "The experimental method is a way of teaching when students do an experiment on something, observing the process and writing the results of the experiment, then the results of observations are submitted to the class and evaluated by the teacher. The experimental method is very supportive of the creation of an optimal teaching and learning process where the attention of the students is more focused on the given lesson. During the learning process students can participate in active natural knowledge and gain hands-on experience, and can develop their skills, so that students can better understand the subject matter well taught, with experimental methods in learning can involve students actively in the process of the discovery of the material taught so that liveliness student learning can be better. (Kim, Brown, Fields, & Stichler, 2009).

The experimental method is as a way of teaching and learning involving students by experiencing, testing and proving their own experimental processes and results. Implementation of experimental methods helps students in their learning process. This method is also an opportunity for individual or group students, to be trained in a process or experiment and also students can be trained in a scientific way of thinking. With this method students are given the opportunity to experience themselves or conduct themselves, follow the process, observe an object, analyze, prove, and draw their own conclusions about a particular object, state or process. Thus, students are required to experience themselves, seek truth or try to find a law or proposition and draw conclusions from the process they experienced in learning.

The article shows about the description of experimental methods, learning activeness and effectiveness of learning model on the subjects of science nature science.

## **2.0 Research Methods**

The approach used in this research is a quantitative approach by quasi experimental design. The variables in this study are the influence of the experimental method as the independent variable given the symbol (X), and the learning activity of the students in the subjects of Science Natural Science in the fourth grade of Indres of Toddopuli I Subdistrict Panakkukang Subdistrict of Makassar City as the dependent variable given the symbol (Y). The design of this research is pretest-posttest control group design. In this design there are two classes chosen at random then given a pretest to know the difference of initial state between the experimental class and the control class. A good pretest result is if the class values differ significantly. The research design used described memalau table as follows:

The population in this study were all fourth grade students of SD Inpres Toddopuli I Kecamatan Panakkukang Makassar City in the academic year 2017 with the number of students as many as 81 people consisting of IVA class as many as 40 students, the number of female students 23 and 17 men, while the IVB class as much 41 students, the number of female students 22 and men 19. The technique used in sampling is stratified random sampling (random stratified sampling technique) consideration that this research is experimental research so that to facilitate doing treatment in the form of learning by applying method, hence set to do grouping to two classes, that is set class which become experiment class and class control group. To define the class that is the experimental group and the control group is done by drawing and determining the value of low student learning activity. Based on the agreement, the class IVA as the experimental group and the IVB class as the control group were determined.

Data collection techniques used in this study are observation, questionnaire and documentation. While analysis technique were descriptive analysis and inferential analysis.

## **3.0 Research Result and Discussion**

The collecting data about the students' initial ability was done in both groups of researchers to conduct preliminary or pretest tests. Then after treatment was given to the experimental group and subsequent control was given posttest in both groups. This posttest is the final test to determine students' ability after being given treatment.

### **3.1 Descriptive Statistics Analysis Result**

Pretest descriptive statistical analysis in the experimental and control classes. The result of descriptive statistic analysis is intended to obtain a description of the students' learning activeness level in the subjects of science natural sciences in the form of experimental method application in experimental group and conventional learning or direct instruction model in control class, the following is presented statistics of students' learning activeness scores on the subjects of science.

Based on the comparison of questionnaire value analysis, the students' learning activity of the experimental class before and after using the experimental method is assessed from the pretest statistic score or the initial questionnaire of the students on the subjects of science

natural science, in the fourth grade of Indres of Toddopuli I Subdistrict, Panakkukang Subdistrict, Makassar City, experiments in the experimental class showed that the sample size was 30 students, the mean (mean) was 79.23, the median value (middle value) was 80.40, the standard deviation value (statistical distribution) was 5,463, the variance value (kaudrad number) was 29,840, with score range 21, lowest or minimum score 67 and highest or maximum (highest score) 8 while the sum value (total probability value of initial test of experiment class) is 2377. This indicates that students' learning activity in The Natural Science Science class experiment before using meto de experiment is in good category (B).

While the result of data statistic processing for posttest that was taught by experiment method in experiment class showed that the sample size was 30 students, mean or mean value was 79.53, median value was 80.00, the standard deviation value was 3,928, the variance value was 15.432, with score range 21, the lowest or minimum score of 70 and the highest or maximum value 91 while the sum value or the amount of probability of the initial test of the experimental class of 2386. This indicates that the learning activities of the students on the subjects of the experimental class after experimental methods have improved and are located in either category (B).

Statistical analysis for experimental group using experimental method and control group with direct instruction grouped into five categories of students' learning activity level is very good category (SB), good (B), enough (C), less (K) and very less (K).

The frequency distribution shows the level of the students' learning scores on the subjects of science natural sciences, the experimental group students before being given treatment as much as 1 respondent are in enough category (C) with percentage (3%) and 24 respondents are in good category (B) with percentage ( 80%) and 5 respondents are in very good category (SB) with percentage (17%) with average score 79,23 which means it is in good category (B). While the frequency distribution of control group before being given treatment is 8 respondents are in enough category (C) with the percentage (26%) and 23 respondents are in good category (B) with percentage (74%) with the average value of 73,03 means to be in either category (C). The purpose of making the frequency distribution is to know the ratio of the percentage of student intervals from the highest value to the lowest value.

Posttest descriptive statistical analysis in the experimental and control classes. After the learning process using the experimental method, then held the final test or posttest as the final step in the implementation of this study. The description of the students' learning activity in the subjects of science nature know after the experimental method used in the experimental class and direct teaching on the control class can be seen in the table of descriptive statistical analysis as follows:

Statistical analysis for control classes with direct teaching or conventional learning shows that the sample size is 31 students, mean (mean) value is 73.03, median value (middle value) is 74.80, the standard deviation value (statistical distribution) is 5,958, the value variance (total kaudrad) of 35.499, with a range (range of values) score of 22, the lowest or minimum value (smallest value) 60 and the highest or maximum (82) and the sum sum This indicates that students' learning activeness in the subjects of natural sciences control class is in good category (B).



Posttest statistical analysis for control class with direct instruction or conventional learning shows that the sample size is 31 students, mean or average value is 75.16, median value is 54.50, standard deviation value is 4,252, variance value is 18,073, with score range 21 , the lowest or minimum score of 66 and the highest or maximum value of 87 while the sum value or the number of obstetric values of control class initial test amounted to 2330. This indicates that the learning activities of students on the subjects of control class or conventional learning also increased only still remain in the good category (B).

Distribution and percentage of posttest score questionnaire of students' learning activity on the subjects of science natural science, students are taught by experimental methods and direct teaching.

The frequency distribution shows the level of students' learning scores on the subjects of science natural sciences, the experimental group students after being given treatment as much as 1 respondent are in very good category (SB) with percentage (3%) and 29 respondents are in good category (B) with percentage (97%) with an average grade of 79.53 which means being in either category (B). While the frequency distribution of the control group after the learning process using the direct teaching without using the experimental method is as much as 1 respondent is in very good category (SB) with percentage (3%), 28 respondents are in good category (B) with percentage (90% ) and 2 respondents are in enough category (C) with percentage (7%) with average value 75.16 which means it is in good category (C). For more data can be seen in appendix 19.

Based on the results of the data can be seen comparison of the average value of the experimental group after treatment or posttest value with an average value of 79.53 while the average value of the control group 75.16. By the difference of 4 from the difference in the mean score of the two groups, this proves that there is a significant difference between the experimental group treated using the experimental method and the control group that did not use the experimental or direct teaching method.

### ***3.2 Inferential Statistic Analysis Results***

The analysis is used to find out the effectiveness of learning method. Based on the value  $t$  arithmetic experimental class  $> t$  table ( $4.233 > 1.70$ ) and the value of  $t$  arithmetic control class  $> t$  table ( $4.168 > 1.69$ ), then  $H_a$  accepted. This means that students' learning activeness in the subjects of science natural sciences, students who are taught using experimental methods are more effective than the learning activity of students who are taught by using direct instruction because the value of significance level is different. For the full data can be seen in appendix 22 of Statistical Package for Social Science (SPSS) version 20.

### ***3.3 Activity of Student Learning***

The result of observation on student learning activity in the experimental class which held three meetings during the learning process took place by using the experimental method can be described as follows:

- a) Students work when assigned by teacher 91.11%.
- b) Students express their opinions when asked by teachers to express an opinion of 81.11%.
- c) Students express opinion in doing group task 67.88%.

- d) Students ask things that are not clear to the teacher 63.77%.
- e) Students do group work 92.33%.
- f) Students answer questions from other friends 50.55%.
- g) Students join the conclusion made friends 55.77%.
- h) Students raised hands to participate in concluding lessons 84.22%

The result of observation of student learning activity on experimental class of meeting I, II, and III shows that the percentage of student learning activity has increased significantly. Based on these data it can be concluded that the existence of an increase in student learning activity in the experimental class using experimental methods with a descriptive scale is in either category (B).

### ***3.4 Learning through the use of direct instruction.***

The result of observation on student learning activity during the learning process took place by direct teaching method during three times meeting can be described as follows:

- a) Students work when assigned by teachers 60.21%
- b) Students give an opinion when asked by teacher to convey opinion 45,16%
- c) Students express opinion in doing group work 44,08%
- d) Students ask things that are not clear to the teacher 19,35%
- e) Students doing group work 87.09%
- f) Students answer questions from other friends 24.73%
- g) Students join menanggapi conclusions made friends 30.10%
- h) Students raised hands to participate in concluding lessons 40.86%

The result of observation of student learning activity in control class of meetings I, II, and III shows that the percentage of student learning activity has increased. Based on the data on the results of student learning activities on the subjects of science natural can be concluded that the percentage of average student activity taught through direct teaching model is in the category of enough (C).

The result of the observation showed that the student activity on the learning by using the experimental method is more active than by using the direct teaching model. This is indicated by the percentage of each item for students taught using a higher experimental method than by using a direct instructional model. This means that learning by using experimental methods is more positively responded by the students than the direct teaching model. From the results of the analysis obtained, enough to support the theory that has been raised on literature review. When viewed from the involvement of students in the learning process, at the time of the experiment was the group using experimental methods showed a high interest, more spirit in learning and students can learn effectively. By applying the experimental method students can improve their skills in solving problems, especially for students who have low ability and make students happy to learn science nature knowledge. Based on the above description it is clear that learning by using experimental methods has an effect on students' learning activities in the subjects of natural science.

The role of the teacher in the experimental method is the facilitator and mediator who guides and directs the students from the stage to the next stage in conducting the experiment, so that it is done effectively. The advantages of experimental methods are the following: (1) with experimental students trained using scientific methods in the face of all problems, so it is

not easy to believe in something that is not certain truth; (2) they are more actively thinking and doing; which is highly desirable by modern teaching and learning activities, where students are more actively learning by themselves with teacher guidance; (3) students in carrying out the experimental process in addition to acquiring knowledge; also found practical experience and skills in using experimental tools; and (4) with student experiments proving themselves the truth of a theory, so that it would change their superstitious attitude, is an unreasonable event.

In addition to having several advantages, the experimental method also has some shortcomings. that: (1) tools and materials used in conducting experiments must be complete and generally expensive (2) hamper the speed of learning because the experimental method takes a long time; (3) errors in experimenting will lead to errors in concluding; and (4) not all teachers and students master experimental methods.(Kim et al., 2009)

#### 4.0 Conclusion

Based on the discussion of research results can be concluded that:

- i. Description of students 'learning activeness by using experimental learning methods where students look enthusiastic follow the learning process while the students' learning activeness by applying direct learning where the students look less antusias or lack of enthusiasm in the learning process.
- ii. Activity of student learning after being given treatment by using experimental method on the subject Of Science Knowledge The fourth grade SD Inpres Toddopuli I Kecamatan Panakkukang Kota Makassar for experimental class is in good category (B) while control class is in enough category (C).
- iii. Learning with experimental methods have a positive or significant effect on the activity of student learning on the subjects of science natural knowledge.

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# The Effectiveness of Video Modeling Module To Increase Social Interaction Among 20 Autism Students in Johor Bahru

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## Abstract:

Autism spectrum disorder (ASD) is a developmental disorder that is typically diagnosed during early childhood and it always affects the ability of children to interact and communicate with others. The purpose of this study was to determine the effectiveness of Video Modeling Module to increase social interaction among autism students. Aligned with this research purpose, learning through a Video Modeling Module that emphasizes on social interaction was developed. The module was implemented through quasi-experimental research design using pre and post test involving forty autism students under the Ministry of Education in Johor Bahru. Twenty autism students were placed in the experimental group and another twenty were placed in the control group. Data were analyzed using paired samples *t*-test and *Wilcoxon Signed-rank* test. The analysis showed a significant increase between the pre-post mean scores of the experimental group and control group. The findings proved that the usage of Video Modeling Module could increase social interaction among autism students. The Video Modeling Module can be used as a guide by special education teachers to increase social interaction among autism students.

**Keywords:** Video Modelling Module, Social Interaction, Autism

## 1.0 Introduction

Autism Spectrum Disorders (ASD) is the most widely recognized developmental disorder characterized by severe and pervasive impairments in several areas of development, for example reciprocal social interaction skills, communication skills and the presence of restricted repetitive and stereotyped patterns of behavior, interests and activities (American Psychiatric Association, 1994). It is always diagnosed before the age of three, due to their profound communication delays (Solomon, Goodlin-Jones, & Andres, 2004). Children with ASD just make or accept fewer social interaction and spend more time playing alone compared playing with their friends (Nikopoulos & Keenan, 2007)

Children with ASD often have social interaction skills that are significantly below those of their neurotypical peers; peers who have had typical neurological development. The example of social interaction such as maintaining eye contact during a conversation, taking turns in conversations, reading nonverbal cues and maintaining appropriate social distances (Bellini & Akullian, 2007; Maag, 2006; Mechling & Gustafon, 2008; Shukla-Mehta, Miller & Callahan, 2011; Weiss & Harris, 2001 ). They do not have interest to join their peers' activities because they do not know how to start conversation with other person (Kokina & Kern, 2010). The inability to get engage with social situations is one of the important factors

of the problems. Due to have social interaction problems, children with ASD are often isolated (Symes & Humphrey, 2010).

Nowadays, there are many studies have been conducted to promote the social skills of children with autism by focusing on increasing their social interaction with others. A promising practice in this regard is the use of videotape technology, which has been used to teach a wide variety of skills to individuals across a range of disabilities and ages. Recently, there has also been interest in the use of treatments such as video modeling and video feedback for children with autism. Video modeling is defined as watching the target behaviour through video in order to learn the behaviour or skills. According to Crozier & Tincani (2005), Kokina & Kern (2010) and Schneider & Goldstein (2010), majority of children with ASD are visual learners, so visual instruction and information is very important for them. Children with ASD usually get benefits from visually cued instruction (Quill, 1997) and easy to process visual information compare to verbal information based on many studies using standardized intelligence tests (DeMyer, 1974; Shah & Frith, 1983; Happe, 1994; Freeman, 1985; Asarnow, 1987; Lincoln, 1988).

According to Cihak & Schrader (2008), video modeling is a technique used to teach a variety of skills including play behaviors, daily living skills, adaptive social behaviors, and conversation skills to children with ASD. Variety of theories have been presented to explain why video modeling is successful for many students with ASD. According to McCoy and Hermansen (2007), the visual nature of this strategy helps students with ASD to find an appropriate frame of reference for their behavior in a given context. Video modeling may help individuals with ASD to circumvent their difficulties with imitation and incidental learning. After watching the model's behaviour from the videotaped, then it is hoped that the children will show that specific behaviour in general settings (Haring, Kennedy, Adams, & Pitts-Conway, 1987; Morgan & Salzberg, 1992). Video modeling as one of the treatment to ASD children has been effective to increase pre-school children's social interaction and social play (Ballard & Crooks, 1984). As mentioned above, video modeling combines between visual cues and modeling. The combination between visual cues and modeling in instruction builds on the strengths of children with ASD. According to Bellini and Akullian (2007), video modeling is also suitable to ASD children who are visual learners.

Video modeling may also effectively help children with autism to learn from modeled behaviours and to concentrate on these behaviors in a way that they would not do if provided with live models (Charlop & Milstein, 1989). Children with ASD typically have strong visual learning styles and the use of video modeling supports this learning style (Mechling & Gustafson, 2008; Shukla-Mehta, 2010). The extensive use of videos in training may stem from the obvious shift in emphasis from language-based instruction to more visual instructional supports for teaching individuals with multiple disabilities and autism (Quill, 2000). Visual discriminative stimuli have been demonstrated to be effective for children with autism (Rao & Gagie, 2006). Research shows that children with autism look longer and more often at the human figure than at neutral objects when presented in pictures even though they may face major difficulties in orienting to social stimuli or in looking at people in real life contexts (Van der Geest, Kemmer, Camfferman, Verbaten, & Van Engeland, 2002; Dawson, 1998; Matson, Cherry & Swettenham, 1998).

Past studies showed that video modeling is a teaching methodology that may be more effective for children who have limited ability to comprehend verbal descriptions or whose visual processing abilities are relatively intact compared to their auditory processing skills

(Schreibman, 2000; Sherer, 2001). Charlop-Christy, Le, and Freeman (2000) investigated the effect of video modeling to teach children with ASD. Video and *vivo* modeling interventions were planned for five children ages 7-11 with ASD and compared the results. At the end of the intervention, video modeling facilitated faster acquisition of skills to four out of five children. All children were able to generalize the skills taught using video modeling, whereas none of the children were able to generalize the skills taught using *in vivo* modeling.

Hence, we can conclude that in order to improve social interaction among ASD children, appropriate training and well planned treatment strategies must be given which aims to increase social interaction among ASD children. The main objective of this study is to determine the effectiveness of video modeling module by looking at the rankings of social interaction instrument scores before and after the implementation of Video Modeling module in treatment groups.

## **2.0 Research Method**

This study was based on quasi-experimental research design using pre-test and post-test method (Creswell, 2007; Campbell & Stanley, 1963). Two groups of ASD children involved in this study, one from experimental group and another one from control group. Teachers from experimental group used the Video Modeling Module in the teaching and learning process to increase social interaction among ASD children while teachers from control group just used the usual learning activity.

### **2.1 Participant**

A group of 7-11 years ASD children from primary school around Johor Bahru were gathered as the sample for this study. The study involved 40 ASD children from 10 primary schools under the Ministry of Education. Twenty ASD children were selected as an experimental group while the other twenty ASD children were selected as the control group.

### **2.2 Research Instruments**

A set of questionnaires was developed to measure social interaction among ASD children. Researcher was conducted pre-test to both the experimental and control groups before ASD children from the experimental group were completed all the activities in the Video Modeling Module. After three months, the post-test was conducted. This is to test the effectiveness of the module in order to increase social interaction among ASD children.

This questionnaire consists of 19 question items. The question items were developed based on two variables, communication and social connection by referring Social Interaction Anxiety Scale (SIAS) put forward by Mattick dan Clarke (1998). The question items have been reviewed by four experts who were qualified in psychology and special education field to ensure the content validity of the questionnaire. The four experts were chosen based on their knowledge and experience acquired and also their willingness to guide the researcher improves the question items. To test the reliability of the test, a pilot study was carried out to 30 special education teachers from 7 schools who did not involve in the actual study.

### 2.3 Procedure

A 45 minutes to one hour Video Modelling Module is being conducted for 3 months on experimental group while the control group did not receive any training. For the first week, teachers from both experimental and control group answered the similar pre-test based on their students' social interaction problems. After that, teachers from experimental group conducted the Video Modelling Module to the ASD children. The activities in the module were compiled based on 10 sub modules which adapted from 10 video modelling. These activities complete with several graphic elements and interactive activities in order to increase interest and attention of ASD children for example, activities likes singing, colouring and incooperative play mode, which hope to increase social interaction among ASD children. After 3 months, teachers from both experimental and control group answered the similar post-test on their students' social interaction problems.

### 3.0 Result

There were 40 ASD children from 10 primary schools under the Ministry of Education involved in quantitative analysis using quasi experimental design. In this section, descriptive analysis test of social interaction scores before and after the implementation of Video Modeling Module in experimental and control groups are presented in Table 1. These scores showed the difference between the pre-test and post-test results.

**Table 1:** Descriptive Analysis for Social Interaction Test between experimental and control group.

Group	Eksperimental		Control	
	Pre Test	Post Test	Pre Test	Post Test
N	19	19	19	19
Mean	47.35	52.95	31.65	31.35
Standard Deviation	11.65	10.72	6.92	7.29
Varian	135.61	115.00	47.92	53.08
Kurtosis	0.36	1.34	-0.45	-0.49
Minimum	20.00	28.00	23.00	20.00
Maximum	61.00	63.00	45.00	45.00

The results of descriptive analysis test indicated that there were positive changes in all subtests of social interaction for experimental group after the intervention. The social interaction subtests for experimental group obtained the pre-test mean score of 47.35 and post-test mean score of 52.95. The increase in the mean score was 5.60. While the social interaction subtests for control group obtained the pre-test mean score of 31.65 and post-test mean score of 31.35. The control group had decreased 0.5 mean score compared to the experimental group had increased 5.60 score.

**Table 2:** Wilcoxon Signed Rank test results for pre and post test social interaction mean score experimental group

Group	Experimental		Z	p
	Pra Test	Post Test		
N	19	19		
Mean (M)	47.35	52.95	-3.832	.000
Standard Deviation	11.65	10.72		

The results of Wilcoxon signed-rank test analysis indicated that there were positive changes for experimental group after the intervention. Table 2 showed positive changes with the mean of 47.35 to 52.95 and showed significant differences ( $Z = -3.832$ ,  $df = 19$ ,  $p=.000$ ).

**Table 3:** T-test results for pre and post test social interaction mean score control group

Group	Control		T	p
	Pre test	Post test		
Test				
N	19	19		
Mean (M)	31.65	31.35	1.453	.163
Standard Deviation	6.92	7.29		

The results of paired samples t-test analysis indicated that there were negative changes for control group after the intervention. Table 3 showed negative changes with the mean of 31.65 to 31.35 and no significant differences ( $t = 1.453$ ,  $df = 19$ ,  $p=.163$ ).

**Table 4:** Wilcoxon Signed Rank and t-test results for mean score control and experiment group

Group	Test	Mean	Standard Deviation (SD)	Value	p
Experimental	Pre	47.35	11.65	$z = -3.832$	.000
	Post	52.95	10.72		
Control	Pre	31.65	6.92	$t = 1.453$	.163
	Post	31.35	7.29		

Based on Table 4, results of *Wilcoxon Signed-rank* and paired samples t-test showed significant differences in the experimental group ( $z = -3.832$ ,  $df= 19$ ,  $p= .000$ ) but not in control group ( $t = 1.453$ ,  $df = 19$ ,  $p=.163$ ). So, from the result, we can see that ASD children ( $n = 19$ ), who receive teaching using Video Modeling Module acquired significantly higher inferential score for social interaction subtest ( $M=52.95$   $SD=10.72$   $n=19$ ) than ASD children who followed the usual teaching process ( $M=31.35$ ,  $SD=7.29$ ,  $n=19$ ).

So, from the quasi-experimental analysis, the experimental group has gained a significant and higher increment in the mean scores compare to control group. The findings showed that the use of Video Modeling Module by the experimental group increase the social interaction among ASD children

#### 4.0 Discussion and Conclusion

This study showed the effectiveness of Video Modeling Module for children with ASD. It is shown by looking at the rankings of social interaction scores before and after the implementation in experimental (using the Video Modeling Module) and control groups (regular teaching) in children with ASD. The findings showed that there are positive changes for experimental group after the implementation of Video Modeling Module. Based on the result from this study, we can conclude that there was a significant increase in social interaction among ASD children. It can be explained that video modeling is a promising practice that we could consider implementing in children with ASD. Video modeling also can describe as an effective intervention strategy to improve social interaction of children with ASD.



This finding is supported by Bellini and Akullian (2007), who concluded in a meta-analysis of 23 studies published between 1987 and 2005, that video modeling could be effective in social-communication skills, functional skills, and behavioral functioning. Specific areas successfully addressed in research include social skills (Bellini, Akullian, & Hopf, 2007), play behavior (Reagon et al., 2006), conversation skills (Wert & Neisworth, 2003), and self-help skills (e.g., Shipley-Benamou, Lutzker, & Taubman, 2002). Very few studies have addressed behavioral functioning; however, these studies have examined problem behavior and off-task behavior with promising results (Bellini & Akullian, 2007).

Video modeling is also promising in the school environment because of its cost-effectiveness and the ease with which it can be implemented. Since videotapes provide a permanent product, one video recording of a model's actions could reduce the cost of live models employed in training programs (Racicot & Wogalter, 1995). In addition, they also analyzed the time needed to execute both methods, and concluded that the amount of time needed for video modeling was substantially less than the amount of time needed for regular teaching (Charlop-Christy, 2000). The use of video modeling also may be successful because the video can repeatedly provide reinforcement of the behavior or skill while a teacher may be interrupted and cannot always provide repetition of instruction (Mechling & Gustafson, 2008)

In a nutshell, ASD children of the treatment group in this study showed positive significant changes in social interaction instrument after the implementation of video modeling module. The findings proved that the Video Modeling Module could significantly increase social interaction in children with autism. The previous teaching skills for ASD children which were based on verbal information were transformed to visual information which more fun. For future study, in order to see the effectiveness of this Video Modeling Module; it is best to do a study on other ASD children using this module.

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# **Reliability Index of Creative Thinking as Higher Order Thinking Skills among Electrical Technology Teacher**

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## **Abstract:**

Teachers are the backbone of the education system in technical education and the executor of the policies and goals that have been set by the government through the Ministry of Education. Creative thinking is one of the higher order thinking skills that are involves both cognitive skills and dispositions. Empirical research suggest that people begin developing creative thinking at a very young age. Teachers are urged to provide explicit instruction in creative thinking which to teach how to transfer knowledge creatively towards students. In order to transfer creative thinking, teacher should be infused with the sub skills that are contributing to the development of creative thinking among teacher.

**Keywords:** Creative Thinking, Higher Order Thinking Skills, Teacher

## **1.0 Introduction**

Higher order thinking skills has been implemented in Malaysia since 1988 through Malaysia Integrated Curriculum for Secondary Schools (MICSS). The objective of this implementation is to make students learn how to think more creatively and critically (Yee et. al, 2011). Thinking skills are needed not only in the worlds of work, education and training but in the context of family friendship and community and in the construction of personal and shared beliefs and values. There is a good evidence that organizations are more successful the more they involve their members in the process of problem solving and decision making. In the information age, qualities of independence and flexibilities are highly valued and learning to learn has become an important goal. Rapid changes in the world in of work required vocational college or technical and vocational education and training providers to strengthen their role in producing highly skilled human capital to supply the industrial demand (Jailani, Wan Mohd Rashid, Noraini and Wahid, 2005).

## **2.0 Background of Study**

In preparing students for rapid changing world, Sean et. al (2014) stated that educators must realize that the need to cultivate higher order thinking skills in addition to technical competencies within curriculum. This is supported by Duderstadt (2010) and Phase (2005) which stated that higher order thinking skills enable learners to analyze data from a variety of information sources, to develop and analyze requirements stemming from the problem space as well as to analyze proposed solutions. In the early of 20th century, education focused on the acquisition of basic skills such as reading, writing and counting. Most schools have not emphasized on think critically or to solve the complex problem. The textbooks are filled with facts that required students to memorize and their ability to remembered. Students will have tested based on how much they remember the facts. The teacher's main role only transferring

the knowledge and provide the information to their students (Nor 'Azah and Shamsiah, 2017).

Malaysian technical and engineering education teacher and graduates are lack of soft skills and thinking skills. This reflected to the graduates as Idham et. al (2014) and Hasliza (2002) conclude that graduates were unable to find a place in the market is due to of lack the generic skills or soft skills such as higher order thinking skills. According to the structure of Malaysia Occupational Skills Qualification (MOSQ) generic skills and soft skills is one of the elements that are needed National Occupational Skill Standards (NOSS). National Occupational Skills Standards (NOSS) is used as the main criteria in determining the level of competencies which the trainee required.

According to Siti Marlina (2013) teachers are often to confuse whether to teach creative and critical thinking skills in isolation or to integrate them into daily lessons. Teachers in Malaysia also lack the time to carefully plan and create a lesson that effectively infuse the thinking skills. In addition, teachers in Malaysia also lack creativity in thinking planning and implementing a lesson which they find very difficult to infuse higher order thinking skills which creative thinking, (Kim and Reeves, 2007) in daily lessons without overwhelming the content.

### **3.0 Objective**

The objective of this study is to determine the reliability index of items and separation index of the creative thinking sub-skills.

### **4.0 Methodology**

It is very important researcher to understand the underlying philosophy of research. This is due to researcher will be able to adopt the most appropriate techniques and approaches in research methods (Mohd Tobi, 2013). Definition of research design is to describe the general procedure for carrying out scientific a scientific research as well as guiding in the research procedure to gather, analyze and interpret data (Nornazira, 2016). The research design will help the researchers to get information and objective of the study was conducted. This study is to obtain feedback on the application of higher order thinking skills gained through teaching and learning approach. Research design describes the general procedure for carrying out a scientific research. It serves as a guide in the research procedure to gather, analyze and interpret the data. Choosing an appropriate research approach is critical for any researchers who intend to conduct any type of research (Cresswell & Plano, 2011).

This study employed quantitative approach. According to (Kothari, 2009), quantitative research is used based on the understanding that the amount of observable fact in a research can be described on the parameter of its quantity. As for this research quantitative research will be used to describe the data collection from structured questionnaire (data collection instrument).

#### **4.1 Rasch Model Analysis**

Measurement in instrument development process is very important because it affects research in many ways. Rasch model analysis had been proved as an excellent measurement method by many researchers around the globe (Carvalho, Primi and Mayer,2012).

Measurement is referred as a process with the aims to discover ratios rather than assigning numbers (Ewing, Salzberger and Sinkovic, 2005). There are shown that it is increasing numbers of research that are using Rasch model analysis in development of instrument and also validate the instrument especially in the context of providing evidence of validity and reliability of constructs being measured (Zhang and Zhang, 2015).

By using Rasch model analysis, it allows researcher to comprehend several measurement issues such as the requirement of variant measurement for example the ratio of difficulties between any pair of the items remains constant across ability levels of respondents. By using Rasch model analysis also researcher be able to determine the requirement for the validity of transformation to interval scaling, appropriate category ordering whether or not in the category ordering polytomous items is working as expected by researcher and also differential item functioning or whether the item is biased among subgroups in the sample. In designing questionnaire, it is often that the ordinal score will be summed (Prieto, Alonso and Lamarca, 2003). Because of that reason, Rasch model analysis be the best at testing the internal construct validity of the scale for unidimensionality identification. By using Rasch model analysis also be able to utilise to demonstrate the relationship between difficulty and person ability. The latent variable is conceptualized as existing along a continuum. Item in the questionnaire can be hierarchically ordered along the continuum. Results provided by Rasch model analysis is specific place on the continuum (Bond and Fox, 2007; Pensavalle & Solinas, 2013).

In this study, 122 teachers who are teaching electrical technology in vocational college across Malaysia had been selected to be respondent. There are 12 sub skills (Rajendran, 2016) that contributing in developing creative thinking is tested. Those 12 sub skills are:

1. Developing constructive idea
2. Relating perception and concept
3. Take multiple point of view
4. Making generalization
5. Combining ideas
6. Expressing ideas
7. Response to the idea
8. Give opinion
9. Response to the idea
10. Developing communication
11. Analyze the idea.

During instrument testing, respondents need to give their opinion on how these 12 sub skills are important in developing creative thinking among them. Respondents are asked to rate their opinion according to five-point Likert Scale. g dikeluarkan oleh Abdul Aziz (2005) yang menyatakan bahawa kepimpinan transformasi akan memberikan kebaikan kepada pekerja.

## 5.0 Result

The value for person reliability is 0.78 with the person separation index of 1.90. The person separation index value shows that there are two level of person ability that can be categorized by the instrument. So, we can conclude here there are two level of respondents. Figure 1 shows the person reliability and person separation for creative thinking skills.

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	51.0	12.0	2.26	.49	1.03	.0	1.00	-.1
S.D.	5.5	.0	1.08	.12	.55	1.4	.53	1.4
MAX.	59.0	12.0	4.93	1.03	2.93	3.6	2.94	3.6
MIN.	26.0	12.0	-1.30	.34	.09	-3.9	.08	-4.0
REAL RMSE	.55	TRUE SD	.92	SEPARATION	1.67	Person	RELIABILITY	.73
MODEL RMSE	.50	TRUE SD	.95	SEPARATION	1.90	Person	RELIABILITY	.78
S.E. OF Person MEAN = .10								

Figure 1

On the other hand, the value of items reliability for creative elements is 0.86. As for the item separation there are three level which produce the separation index 2.51. Its mean that there are three level of difficulties across all the item. Figure 2 shows the item reliability and item separation for

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	522.7	122.0	.00	.15	1.00	.0	1.00	.0
S.D.	19.3	.0	.40	.01	.21	1.5	.24	1.6
MAX.	544.0	122.0	.73	.16	1.32	2.2	1.38	2.6
MIN.	486.0	122.0	-.47	.13	.67	-2.5	.75	-1.8
REAL RMSE	.15	TRUE SD	.37	SEPARATION	2.39	Item	RELIABILITY	.85
MODEL RMSE	.15	TRUE SD	.37	SEPARATION	2.51	Item	RELIABILITY	.86
S.E. OF Item MEAN = .12								
UMEAN=.0000 USCALE=1.0000								
Item RAW SCORE-TO-MEASURE CORRELATION = -1.00								
1392 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 2469.33 with 1262 d.f. p=.0000								
Global Root-Mean-Square Residual (excluding extreme scores): .6335								

Figure 2

## 6.0 Discussion and Conclusion

One of the skill that is important in infusing higher order thinking skills among electrical technology teacher is creative thinking. According to Fautley and Savage (2007), creativity among teacher is about how a teacher to captivate students interest in learning electrical technology. This is including suitable approach that a teacher is using during teaching and learning session. Creative thinking is important as a creative electrical technology teacher be able to adapt, create and evaluate ideas for their own curriculum needs. According to Ken (2013), a creative electrical technology teacher is the person who empowers sensible dangers and capricious circumstances while fortifying creative exercise in the classroom or workshop during teaching and learning. Based on the results, it shows that all sub skills are needed in developing creative thinking. Figure 3 shows that fit statistic in measuring the subskills that contribute in developing creative thinking.

Item STATISTICS: CORRELATION ORDER													
ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PT-MEASURE CORR.	EXP.	EXACT MATCH OBS%	EXP%	Item
12	531	122	-.16	.15	1.11	.8	1.26	1.7	.46	.55	65.5	58.5	I0012
3	530	122	-.14	.15	1.32	2.1	1.33	2.1	.47	.55	58.6	58.5	I0003
1	492	122	.63	.13	1.32	2.2	1.38	2.6	.50	.61	42.2	51.6	I0001
5	486	122	.73	.13	1.10	.8	1.22	1.6	.54	.62	44.8	51.8	I0005
2	499	122	.50	.14	1.21	1.5	1.19	1.4	.57	.60	50.9	53.7	I0002
11	544	122	-.47	.16	1.05	.4	.84	-1.0	.60	.53	67.2	62.2	I0011
9	540	122	-.37	.16	.92	-.5	.82	-1.2	.60	.54	70.7	60.5	I0009
10	535	122	-.25	.15	.89	-.7	.82	-1.2	.61	.55	69.0	60.0	I0010
7	540	122	-.37	.16	.80	-1.4	.75	-1.7	.61	.54	66.4	60.5	I0007
4	513	122	.23	.14	.79	-1.6	.87	-.9	.61	.58	61.2	55.8	I0004
8	537	122	-.30	.16	.67	-2.5	.75	-1.8	.62	.54	69.0	60.2	I0008
6	525	122	-.02	.15	.79	-1.5	.78	-1.7	.64	.56	63.8	57.9	I0006
MEAN	522.7	122.0	.00	.15	1.00	.0	1.00	.0			60.8	57.6	
S.D.	19.3	.0	.40	.01	.21	1.5	.24	1.6			9.3	3.4	

Figure 3

Figure 3 shows that all 12 sub skills that named as I001,I002,I003,I004,I005,I006,I007,I008,I009,I009,I010,I011 and I012 have the range of the outfit meansquare value from 0.75 until 1.38. According to the Linacre (2002) stated that item which are below or exceeded 0.6 to 1.4 has to be seperated due to the out of accepted value. According to the analyzed results, there shows that all the item are fit to measure creative thinking.

As the conclusion, in developing creative thinking among teachers who are teaching electrical technology in college vocational, 12 sub skills are needed to be infused in their teaching and learning session. 12 sub skills are developing constructive electrical technology idea, relating between perception and concept in electrical technology, be able to take multiple point of view regarding electrical technology, making generalization about content in electrical technology, combining electrical technology related ideas, generating new idea regarding electrical technology, give their opinion about electrical technology, developing communication about electrical technology and analyze the idea regarding electrical technology.

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# Pendidikan STEM Bersepadu ke Arah Meningkatkan Kemahiran Penyelesaian Masalah Matematik

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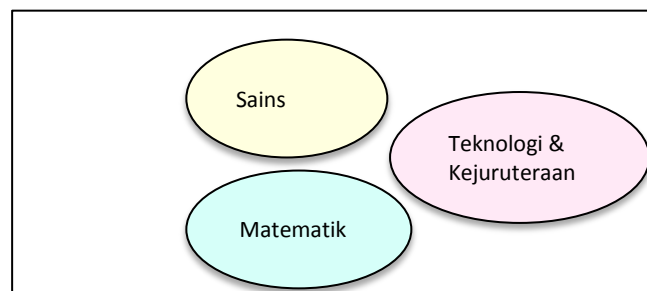
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## Abstrak:

STEM adalah akronim bagi sains, teknologi, kejuruteraan dan matematik dan telah menjadi agenda penting pendidikan di Malaysia selari dengan pelaksanaan Pelan Pembangunan Pendidikan Malaysia 2013-2025 bagi menyediakan generasi muda yang berdaya saing menjelang abad ke 21. Kemahiran abad ke 21 merupakan kemahiran yang amat diperlukan dalam pasaran kerja masa kini terutamanya dalam industri pembuatan yang memerlukan kemahiran penyelesaian masalah, interpersonal dan kemahiran berfikir. Untuk memastikan generasi muda berupaya mengaplikasikan kemahiran abad ke 21 dalam pelbagai situasi, pengenalan STEM bersepadu di peringkat persekolahan dilihat sangat suatu kaedah yang berpotensi untuk menjayakannya. Penyelesaian masalah melibatkan konteks dunia sebenar memerlukan pelajar memindahkan strategi penyelesaian yang dipelajari kepada masalah yang dihadapi. Kompetensi penyelesaian masalah ditakrifkan sebagai keupayaan untuk menyelesaikan masalah dengan menggunakan kemahiran kognitif seperti pemikiran logik (Jonassen, 2011; OECD, 2004). Objektif utama artikel ini ialah memperkenalkan pendekatan STEM Bersepadu dalam pengajaran dan pembelajaran penyelesaian masalah matematik di sekolah menengah.

## 1.0 Pengenalan

Pendidikan STEM Bersepadu ialah kombinasi sains, teknologi, pendidikan dan matematik ke dalam satu pengajaran bertujuan untuk memastikan pelajar berupaya memahami perkaitan di antara empat disiplin tersebut dengan kehidupan seharian. Walaupun, STEM Bersepadu telah diperkatakan secara meluas di seluruh dunia, namun pengajaran dan pembelajaran di dalam bilik darjah di Malaysia masih mengekalkan pengajaran sains, teknologi, pendidikan dan matematik secara *silo*. Pelan Pembangunan Pendidikan 2013-2025 telah menggariskan keperluan pendekatan STEM dalam sistem pendidikan di Malaysia supaya dapat melahirkan generasi baru yang berdaya saiang di peringkat global. Rajah 1.1 menunjukkan pendekatan *silo* yang selalunya dilaksanakan di sekolah-sekolah di Malaysia



**Rajah 0.1:** Pendekatan silo dalam pendidikan STEM

Berdasarkan Rajah 2.2, setiap bulatan mewakili disiplin dalam STEM yang di ajar secara individu dan terasing. Setiap domain pengetahuan hanya terbatas kepada setiap disiplin sahaja memandangkan ianya di ajar secara berasingan. Oleh kerana pendekatan ini secara *silo*, Dickstein (2015) menegaskan bahawa wujud kelemahan dalam penggunaan pendekatan ini dalam pengajaran dan pembelajaran di bilik darjah. Salah satu kelemahan yang ketara ialah kegagalan pelajar menggabungkan kemahiran daripada pelbagai bidang (sains, teknologi, kejuruteraan dan matematik) dalam masalah sebenar yang dihadapi.

Perspektif yang sempit menjurus kepada persepsi buruk pelajar terhadap bidang berkaitan STEM. Ini kerana, pelajar secara tidak langsung membuat tanggapan bahawa tidak wujud perkaitan antara disiplin ilmu dalam STEM dan hubungannya dengan situasi dalam dunia sebenar. Akhirnya, pelajar menganggap tiada kepentingan untuk menceburi kerjaya STEM kerana tidak wujud pengintegrasian di antara STEM dengan kehidupan mereka (Breiner *et al.*, 2012). Tanggapan pelajar ini akan mendorong kepada halangan terhadap perkembangan akademik apabila pembelajaran berpusatkan guru dalam bentuk syarahan lebih dominan berbanding dengan penyertaan aktif pelajar dalam bilik darjah. Pelajar hanya menerima tanpa perlu berfikir secara kritikal terhadap isi kandungan yang disampaikan sedangkan hakikatnya pendekatan “hands-on” terbukti lebih wajar untuk pembelajaran (Dickstein, 2010; Deslauries *et al.*, 2012)

## 2.0 Pendidikan STEM Bersepadu

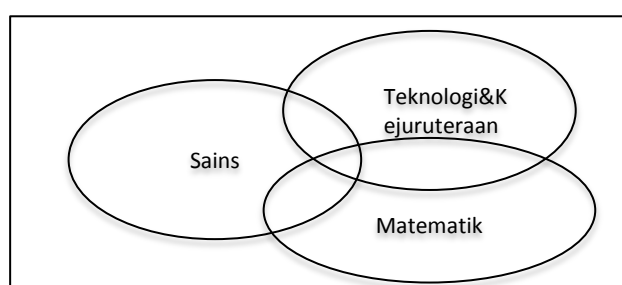
Pendidikan STEM Bersepadu ditakrifkan sebagai pengajaran dan pembelajaran isi kandungan serta amalan bidang ilmu yang menjadikan sains dan matematik sebagai teras dengan mengintegrasikan amalan saintifik dan kejuruteraan (Bryan, Moore, Johnson dan Roehrig, 2016). Pengenalan kepada pendidikan STEM adalah selaras dengan perkembangan semasa yang memerlukan tenaga kerja berkemahiran STEM menjelang abad ke 21. Kemahiran ini merujuk kepada komunikasi dan kolaborasi, pemikiran kritikal dan penyelesaian masalah, literasi maklumat dan kebolehan menyesuaikan diri dengan ekonomi global yang semakin pantas berubah. Hampir setiap pekerjaan sekarang memerlukan kecekapan teknologi gunaan dan pertumbuhan pesat karier yang melibatkan matematik dan sains. Takrifan pendidikan STEM telah dipelbagaikan daripada pendekatan disiplin sehingga pendekatan transdisiplin (Burke *et al.*, 2014; Madam *et al.*, 2014; Moore dan Smith, 2014; Vasquez, 2014/2015; Vasquez *et al.*, 2013; Rennie *et al.*, 2012). Jadual 2.10 menunjukkan peningkatan tahap pengintegrasian yang diadaptasi daripada Vasquez *et al* (2013).

**Jadual 1.1:** Peningkatan tahap pengintegrasian

Bentuk Pengintegrasian	Ciri-ciri
Disiplin	Konsep dan kemahiran dipelajari secara berasingan dalam setiap disiplin
Multidisiplin	Konsep dan kemahiran dipelajari secara berasingan dalam setiap disiplin tetapi dalam tema yang sama.
Interdisiplin	Konsep dan kemahiran yang hampir dikaitkan dipelajari dari dua atau lebih disiplin dengan tujuan mendalamkan pengetahuan dan kemahiran.
Transdisiplin	Pengetahuan dan kemahiran yang dipelajari dari dua atau lebih disiplin digunakan untuk masalah dan projek dunia nyata, dengan itu membantu membentuk pengalaman pembelajaran.

Pengajaran dan pembelajaran dalam bidang sains, teknologi, kejuruteraan dan matematik yang meliputi semua aktiviti pembelajaran dari peringkat pra sekolah hinggalah ke

universiti, dan semua pembelajaran formal atau tidak formal (Gonzalez dan Kuenzi, 2012) merupakan takrifan pendidikan STEM. Menurut Gonzalez dan Kuenzi, inkuiri penemuan sains diperolehi melalui penyiasatan manakala reka bentuk kejuruteraan melibatkan pembentukan masalah yang boleh diselesaikan melalui penilaian di peringkat akhir sesuatu reka bentuk. Namun begitu, kedua-dua penyelidik ini berpendapat, pendidikan STEM menggabungkan konsep saintifik dan reka bentuk kejuruteraan ke dalam ke empat-empat disiplin ilmu tersebut. Tsupros (2009) menyatakan pendidikan STEM merupakan pendekatan interdisiplin terhadap pembelajaran melalui pengukuhan konsep akademik yang padat dan ditambah dengan pembelajaran secara tidak langsung terhadap situasi dalam dunia sebenar. Apabila pelajar menggunakan sains, teknologi, kejuruteraan dan matematik semasa menyelesaikan masalah, mereka sebenarnya sedang mengaitkan sekolah, masyarakat, tempat kerja dan usaha global yang mendorong kepada pembangunan literasi STEM dan keupayaan untuk bersaing dengan ekonomi baru



**Rajah 2.2:** Pendekatan Bersepadu dalam Pendidikan STEM

Rajah 2.2 menjelaskan tentang pengintegrasian di antara komponen STEM yang membawa maksud kandungan STEM diajar sebagai satu matapelajaran apabila dua atau lebih disiplin ilmu disepadukan. Pengintegrasian ini diwakili oleh pertindanan antara bulatan. Menurut beberapa orang penyelidik, pengintegrasian merupakan pendekatan terbaik bagi pendidikan STEM (Sanders dan Wells, 2010; Laboy-Rush, 2011; Wang *et al.*, 2011). Pendidikan STEM Bersepadu mempunyai banyak kelebihan termasuk menjadikan pelajar sebagai penyelesaian yang baik, pencipta, pemikir yang logik dan celik teknologi (Morrison, 2006). Kajian juga menunjukkan pengintegrasian matematik dan sains mempunyai kesan kepada sikap positif, motivasi dan minat pelajar di sekolah (Guthrie, Wigfield dan VonSecker, 2000) dan meningkatkan pencapaian (Hurley, 2001). Untuk memastikan manfaat pendidikan STEM Bersepadu dapat dilaksanakan, guru memainkan peranan penting untuk meningkatkan pengetahuan dan ilmu pedagogi berkaitan STEM Bersepadu dalam pengajaran dan pembelajaran.

### 3.0 Penyelesaian Masalah Matematik dalam Konteks Dunia Sebenar

NCTM (2000) menegaskan bahawa pengajaran matematik berpusatkan kepada penyelesaian masalah dapat membantu pelajar meningkatkan motivasi untuk mempelajari konsep dan kemahiran bagi isi kandungan dalam matematik serta prosesnya. Fuchs, Fuchs, Finelli, Courey dan Hamlett (2004) menjalankan kajian untuk mengenal pasti kesan pendedahan terhadap penyelesaian masalah dalam konteks dunia sebenar terhadap pemindahan pengetahuan pelajar sekolah rendah. Pelajar sekolah rendah diberikan empat jenis soalan penyelesaian masalah matematik dalam konteks dunia sebenar. Dapatan kajian menunjukkan bahawa pelajar memerlukan masa untuk membiasakan diri dengan soalan berbentuk konteks dunia sebenar. Kajian ini merumuskan bahawa guru perlu menyediakan

soalan penyelesaian masalah yang berkaitan dengan kehidupan sebenar bagi membolehkan pelajar memindahkan pengetahuan tentang penyelesaian masalah matematik kepada masalah yang diberikan. Lubenski (2000) menjalankan kajian dengan menggunakan *Connected Mathematics Project* (CMP) terhadap pelajar menengah rendah pelbagai sosioekonomi. CMP adalah projek pembangunan kurikulum sekolah menengah untuk menghasilkan set soalan penyelesaian berpusatkan masalah dalam konteks dunia sebenar. Tumpuan utama kajian ini ialah isi kandungan dan proses pembelajaran matematik melalui penyelesaian masalah respon terbuka dan kontekstual. Dapatan kajiannya menunjukkan pelajar yang mempunyai tahap sosioekonomi yang rendah dan telah diberi pendedahan terhadap penyelesaian masalah dalam konteks dunia sebenar telah menunjukkan peningkatan dalam penyelesaian masalah dan keupayaan menterjemahkan masalah dengan lebih baik berbanding dengan pelajar yang menerima pembelajaran melalui hafalan.

Kajian oleh Bomar (2009) menunjukkan pengajaran melibatkan aplikasi konsep masalah dalam dunia sebenar menyebabkan pelajar kurang bertanya tentang prosedur pengiraan, sebaliknya soalan lebih tertumpu kepada scenario masalah yang dikemukakan. Dapatan kajian juga menunjukkan pelajar tidak berminat terhadap penulisan jurnal tetapi suka berbincang tentang kuiz yang telah dicatatkan penyelesaiannya dalam jurnal tersebut. Namun begitu, kajian ini juga mendapati pelajar yang biasanya aktif dalam pembelajaran sebelum ini menunjukkan sikap tidak berminat untuk mengambil bahagian dalam aktiviti pembelajaran yang disediakan. Pelajar-pelajar ini lebih berminat dengan aktiviti pembelajaran yang melibatkan pengiraan matematik seperti biasa (Bomar, 2000).

Mudaly (2004) membuktikan penggunaan *Geometer's Sketchpad* dalam pembelajaran penyelesaian masalah matematik telah meningkatkan keyakinan pelajar dalam memberikan hujah dan bukti bagi setiap penyelesaian masalah yang diselesaikan menggunakan permodelan masalah dalam konteks dunia sebenar. Dapatan kajian ini bertentangan dengan kajian terdahulu oleh Hogson dan Riley (2001) yang merumuskan bahawa tiada bukti kukuh menunjukkan hubung kait di antara aktiviti permodelan melibatkan situasi dalam dunia nyata dengan keupayaan membuat pembuktian. Namun begitu, Hogson dan Riley (2001) bersetuju bahawa pengalaman pembelajaran melibatkan permodelan dalam konteks kehidupan menjadi pemangkin kepada pengenalan pembuktian dalam kalangan pelajar.

Namun begitu, terdapat kajian lepas yang menyokong penggunaan teknologi seperti *Geometer's Sketchpad*, web atau kaedah pembelajaran lain di dalam bilik darjah berpotensi meningkatkan kemahiran penyelesaian masalah pelajar. Penyelidik seperti Hwang, Hung dan Chen (2014); Ackcaoglu, 2014; Yang, 2012) menggunakan pembelajaran berasaskan permainan sebagai intervensi untuk kumpulan rawatan di sekolah menengah manakala Weng, 2015 dan Hwang *et al.*, 2013 menggunakan pelajar sekolah rendah sebagai sampel kajian. Pembelajaran berasaskan permainan mempunyai pelbagai cara penggunaannya. Sebagai contoh, Weng (2015) memperkenalkan animasi permainan komputer sebagai suatu usaha untuk meningkatkan kemahiran penyelesaian masalah pelajar manakala Hwang *et al.*, (2014) membangunkan dan mereka bentuk permainan khusus untuk membantu pelajar menguasai kemahiran penyelesaian masalah. Pembelajaran berasaskan masalah (PBM) juga merupakan kaedah pembelajaran penyelesaian masalah yang kerap digunakan dalam kajian. Aurah *et al.*, (2014) dan Klegeris dan Hurren (2011) memberi pendedahan terhadap penyelesaian masalah melalui langkah-langkah sistematik dalam aktiviti *hands-on* PBM. Manakala, Kim dan Hannafin (2011) menggunakan teknologi sebagai pendekatan dalam PBM untuk memastikan pelajar sekolah rendah terlibat secara aktif dalam aktiviti pembelajaran yang dijalankan. Namun begitu, penggunaan modul pembelajaran oleh Wan Syafii dan Ruhizan (2013) juga

membantu meningkatkan kemahiran penyelesaian masalah pelajar. Yang membezakan kajian Weng (2015), Aurah *et al.*, (2014), Klegeris dan Hurren (2011), Kim dan Hannafin (2011) dan Hwang *et al.*, (2014) dengan Mudaly (2004) hanyalah dari segi masalah matematik yang dikemukakan iaitu tidak berpusatkan kepada masalah dalam kehidupan seharian.

Bokar (2013) membuat kesimpulan bahawa pelajar perlu diberikan persediaan untuk mengaplikasi matematik dalam penyelesaian masalah sebenar. Kajiannya mendapati pendedahan kepada masalah dalam konteks dunia nyata membantu pelajar membina penaakulan matematik dan penaakulan logik yang sangat berguna dalam menyelesaikan masalah. Penyelidik ini juga menekankan kepentingan penggunaan jurnal sebagai suatu cara untuk pelajar mengekalkan kefahaman terhadap proses penyelesaian yang telah dilakukan kerana pelajar bukan sahaja menunjukkan pengiraan bagi masalah tersebut tetapi juga menyatakan sebarang masalah yang ditemui atau idea baru yang diperoleh semasa proses menyelesaikan masalah berlangsung. Penulisan jurnal ini juga boleh digunakan untuk memulakan interaksi dalam bilik darjah sesama rakan sebaya atau guru (Hamdan, 2005; Bokar, 2013). Penulisan jurnal dan jurnal refleksi membantu pelajar membina pengetahuan baru dan membolehkan pelajar mengaitkan konsep matematik dengan masalah yang diberi (Lew dan Schmidt, 2011).

#### 4.0 Penyelesaian Masalah Matematik dalam Konteks STEM

Penyelesaian masalah matematik dalam konteks STEM yang dibincangkan dalam artikel ini merujuk kepada empat isu yang diadaptasi daripada Bybee (2010) merangkumi isu kesihatan, kecekapan tenaga, kualiti alam sekitar dan sumber asli. Pembelajaran berasaskan penyelesaian masalah melalui pengintegrasian STEM dilaksanakan menggunakan modul pembelajaran yang dibangunkan melibatkan aktiviti *hands-on* dan aktiviti penyelesaian masalah. Modul pembelajaran ini mengetengahkan aktiviti penyelesaian masalah melalui pengintegrasian sains, teknologi dan reka bentuk kejuruteraan, Namun begitu, artikel ini hanya membincangkan satu contoh soalan penyelesaian masalah melibatkan pengintegrasian sains iaitu dalam konteks kesihatan. Jadual 2.1 menunjukkan penerangan terperinci bagi kerangka proses penyelesaian masalah Polya (2004).

**Jadual 1.2** Kerangka Proses Penyelesaian Masalah (Polya, 2004)

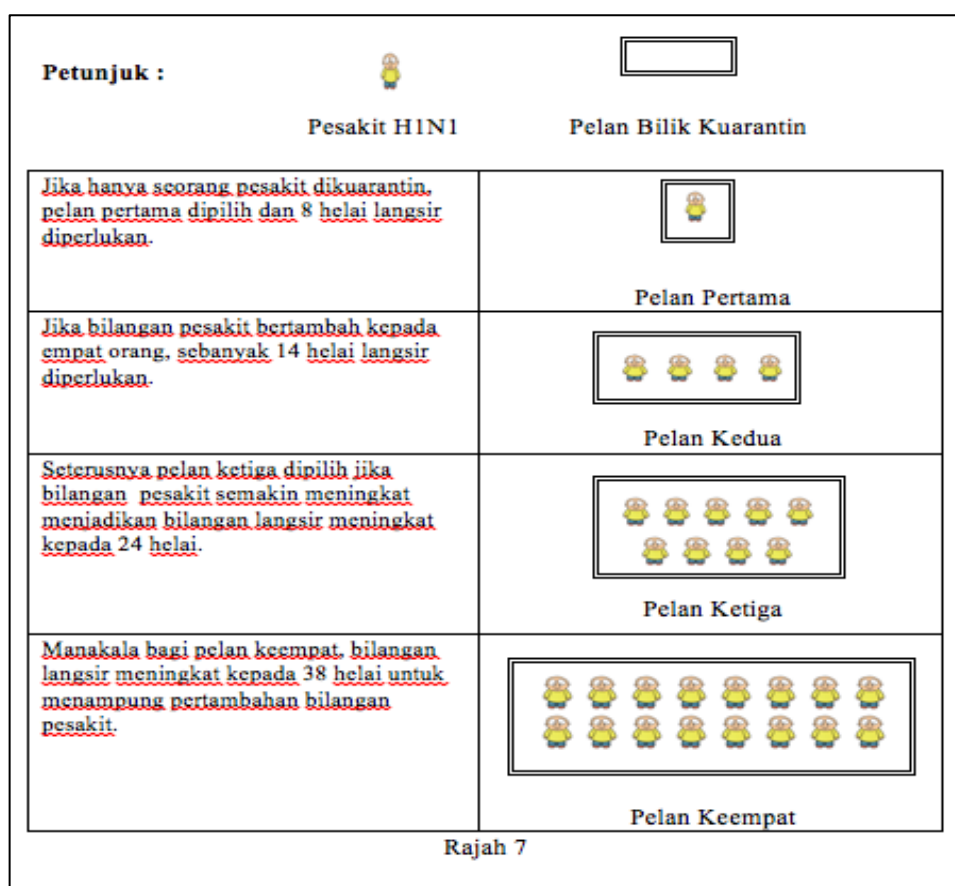
<b>Kriteria</b>	<b>Penerangan</b>
Memahami Masalah	<ul style="list-style-type: none"> <li>▪ Mengeluarkan semua maklumat yang diberi dan menulis semula masalah yang ingin dicari</li> </ul>
Merancang Penyelesaian	<ul style="list-style-type: none"> <li>▪ Menulis semula masalah yang ingin dicari menggunakan ayat sendiri</li> <li>▪ Menentukan strategi penyelesaian yang boleh digunakan seperti melukis rajah, meneka dan menyemak, melihat pola maklumat, membuat simulasi atau membuat senarai</li> </ul>
Melaksana Penyelesaian	<ul style="list-style-type: none"> <li>▪ Jalankan penyelesaian mengikut strategi yang dirancang. Jika gagal, patah balik kepada langkah dua dan cuba strategi lain</li> </ul>
Menyemak Semula	<ul style="list-style-type: none"> <li>▪ Semak jawapan anda semula samada memenuhi kehendak soalan ataupun tidak.</li> </ul>

Fasa dalam kerangka penyelesaian masalah Polya (2004) yang digunakan dalam kajian ini diperjelaskan dengan lebih terperinci melalui satu contoh soalan penyelesaian masalah matematik berasaskan STEM yang terdapat dalam ujian pra yang diselesaikan menggunakan

kerangka penyelesaian masalah Polya (2004). Berikut merupakan satu contoh soalan penyelesaian masalah melalui STEM Bersepadu dalam konteks kesihatan.

#### 4.0 Penutup

Pendekatan STEM Bersepadu yang dipraktikkan kepada pelajar sekolah menengah melalui intervensi modul pembelajaran melibatkan pengintegrasian fasa penyelesaian masalah (Polya, 2004) dan proses reka bentuk kejuruteraan (Cunningham, 2005; MoS, 2012) telah menunjukkan peningkatan yang lebih baik dari segi penglibatan aktif pelajar, pembelajaran lebih bermakna dan peningkatan kemahiran penyelesaian masalah pelajar. Program pendidikan berkaitan STEM Bersepadu dalam pembelajaran penyelesaian masalah matematik diharapkan dapat diteruskan dalam bilik darjah bagi memastikan pengintegrasian teori dan amali dapat diselarakan dengan ilmu pengetahuan yang telah diperoleh



Pelajar menunjukkan proses penyelesaian masalah berdasarkan empat fasa dalam kerangka Polya (2004). Berikut merupakan contoh penyelesaian bagi soalan penyelesaian masalah dalam konteks kesihatan.

- (a) Memahami Masalah menunjukkan pelajar dapat mengenal pasti maklumat dan membuat perkaitan di antara maklumat tersebut. Contoh, pelajar dapat mewakili pemboleh ubah yang dikenal pasti dengan symbol atau *unknown* yang sesuai. Pelajar menggunakan perwakilan yang berbeza bagi pemboleh ubah yang berbeza; bilangan pelan =  $n$ , bilangan langsir =  $y$  dan bilangan pesakit =  $x$ . Pelajar juga dapat menghubungkan kait antara maklumat;  $x$  bertambah dua kali ganda daripada  $n$  atau  $x = n^2$ .

- (b) Keupayaan pelajar merancang penyelesaian bermakna pelajar menggunakan maklumat yang telah dikenal pasti untuk mengenal pasti kata kunci sebelum menentukan strategi penyelesaian. Contoh, pelajar membanding beza kata kunci dalam Tugas 1 iaitu kesimpulan secara aruhan dengan kesimpulan secara deduksi. Seterusnya, menulis semula maklumat dalam bentuk kesimpulan secara aruhan;

$$\begin{aligned}8 &= \blacksquare + 6 \\14 &= \blacksquare + 6 \\24 &= \blacksquare + 6\end{aligned}$$

- (c) Melaksana penyelesaian menunjukkan pelajar berjaya menunjukkan proses kerja secara sistematik dan berupaya menjelaskan setiap proses kerja dengan terperinci. Contoh, pelajar menghubungkan kait antara  $n$ ,  $x$  dan  $y$  dengan membina persamaan.

$$\begin{aligned}8 &= 2(1) + 6 \\14 &= 2(4) + 6 \\24 &= 2(9) + 6\end{aligned}$$

Kesimpulan secara aruhan;  $2x + 6$ , di mana  $x = 1, 4, 9, 16, \dots$

- (d) Menyemak semula memerlukan pelajar menggunakan penggantian nilai, menyemak penggantian nilai dari belakang dan menyediakan alternatif penyelesaian bagi tujuan semakan. Contoh, pelajar berjaya memanipulasikan persamaan daripada  $y = 2x + 6$  kepada  $y = 2n^2 + 6$  dan  $x = n^2$  untuk alternatif semakan. Semakan dari belakang;

$$\begin{aligned}2(1) + 6 &= 8 \\2(4) + 6 &= 14 \\2(9) + 6 &= 24 \\2(16) + 6 &= 38\end{aligned}$$

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# Development of Android-Based Academic Information System

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## Abstract:

Academic information system as a service for students and lecturers should be developed simultaneously. The ease and convenience of accessing are the goals of program development. This study is the development of an academic information system model based on previous information systems services. Model development using ADDIE that has five-steps process of model: analysis design, develop, implement, and evaluate. The analysis step resulted that academic information system can be accessed by using computer and smarthphone. However, the display on the smartphone is less interesting and difficult to be accepted by students. The design stages is to prepare the information system that can be accessed with smarthpone easily. The developing step, the feature and tools of system were created in application form. Implementation of the application in students by field testing for 30 students and 10 lecture resulted well response for system. Evaluating step resulted that the application can be accessed by smarthpone.

**Keywords:** Information system, developing and smartphone

## 1.0 Introduction

The development of information technology around the world makes human life easier. Currently, self-service can be generated by technological transformation and useful in the effectiveness of information services. (Park & Jayaraman, 2003). The benefits of information and communication technologies for the provision of services are able to expand the reach of services in widespread with the number of users. Smart service is a trend of information techonogy. (Jin, Gubbi, Marusic, & Palaniswami, 2014)(Robinson *et al.*, 2014).

Internet network causes the communication becomes increasingly unlimited and without obstacles. Furthermore, utilization of information technology in data management has become a very important requirement and facilitate in getting information whenever and wherever. Its use is almost in all agencies that have very high data transactions. The technology is very instrumental in the utilization and management of data.

Universitas Negeri Makassar is one educational institution has implemented data management system of students using web-based online academic information system. However, complaints about the difficulty of accessing the system require continuous development. A more flexible and easy-to-access information system to guide users' needs. Students and lecturers highly expect information systems that can be accessed by smaller devices (mobile devices) both in terms of capability size and screen resolution. Therefore, the thought of developing web-based academic information system needs to be improved and developed into an academic information system application that can be accessed by mobile devices.

Android-based academic information system is one way problem solving where academic information system that will be designed this is devoted to mobile device application. The system is designed to provide data relating to academic information provided to students that includes student value information, course list information, lecturer list information and filling system of study plans. This effort becomes the answer to the needs of users in obtaining academic information anywhere and anytime.

## **2.0 Theoretical Review**

### **2.1 Android**

Android is the operating system for mobile phones based on Linux. The system provides an open platform for developers to create their own applications for use by various mobile devices. Linux-based operating system for mobile phones such as smart phones and tablet computers. Google along with OHA released a complete SDK software package to develop applications on mobile devices. As programmers and developers we can do everything from SMS application creation makers to just two lines of code, to change the event on Home Screen Android device. In addition, even easily we can create and customize the Operating System, or replace all default applications from google. (Arzt *et al.*, 2014) The superiority of android devices are:

- a. Android strongly supports multitasking applications, or users can easily switch apps just by touching an icon on the system bar.
- b. The technology has better capacity for widgets. For example, widgets for Gmail email are on display Google, users do not need to open the Gmail app to see the contents in it.
- c. The device improved copy-paste ability. Some previous Android series are already able to copy-paste, but some users of text selection problems are rather difficult. Now it is trying to be solved, in addition to copy-paste Google also add share it on the selected text.
- d. Android has the better performance by faster Chrome Browser There is one missing feature in the Chrome browser laid out on previous Android, Tab capabilities. Chrome on Honeycomb can now do that. In addition users can also synchronize between the browser on the phone with Chrome on the computer.
- e. With a larger screen, it automatically makes Google more flexible to place notifications on the screen.
- f. Improved Drag and Drop and Multitouch Larger screen size, demanding Google to increase multitouch capabilities within Android, not to mention the drag and drop feature. In a live demo, users can drag and drop to move email within the Gmail app.

### **2.2 Academic Information System**

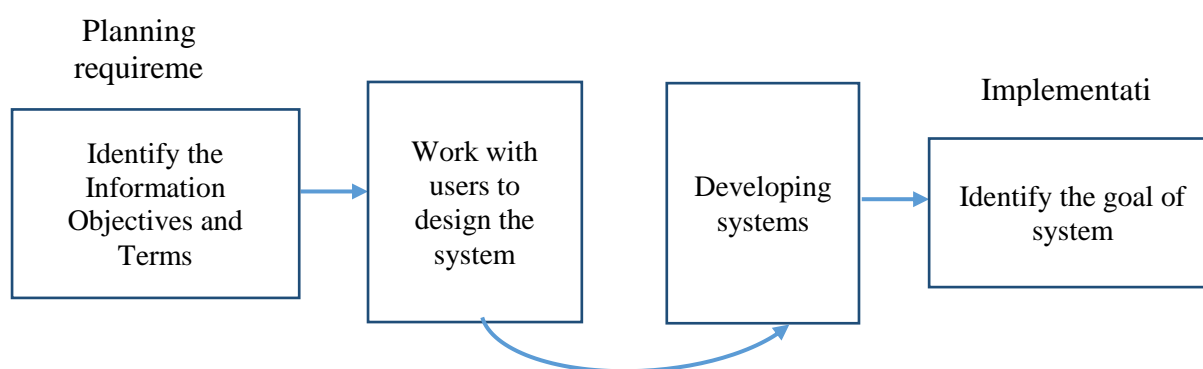
Academic Information System is a technology for managing, disseminating computer-based academic information. This system as a supporter in the storage of academic data. In addition, this system serves as an academic information media that provides information of each actor involved in the system. (Walls, Widmeyer, & El Sawy, 1992)

Android-based academic information system can be said is a replication of academic information systems applied to mobile devices. Mobile device itself is generally defined as a

device that has a small physical size, can be operated anywhere, mobile devices can provide voice and communication services can be a message exchange text or images, mobile devices can access information from the Internet network and display content from information systems, mobile devices can also store large amounts of information.

### 3.0 Research Method

This study uses a qualitative method to describe the process of development and the quality of learning model. Development process model refers to ADDIE model. There are five-step ADDIE processes, they are analysis, design, develop, implement, and evaluate. System development using Rapid Application Development (RAD). The stages of the developmental path are as follows (Clark, 1997)



**Figure 1:** The Development Phase

The purpose of the design is the establish a system that can be implemented into a model of academic information system based on android.

### 4.0 Result

#### 4.1 Analysis

The result of the need assesment indicated that the intensity of academic information system access by students and lecturers is increasingly high. The users also needed the system by using easy and lightweight devices. In addition, users required the intensive communication between students and lecturers based on academic information systems.

#### 4.2 Design

The design of an academic-based information system application using UML (Unified Modeling Language). UML consists of Use Case Diagrams, Activity Diagrams, Class Diagrams and Sequence Diagrams. In addition to the spat with UML, there is a database interfaces.

##### a. Use Case Diagram

Preparation of *Use Case Diagram* based on the actor needed to build an academic system based on android. Actor related to academic information service is admin, lecturer

and student. Design use case diagram Use Case Diagram Admin based on the description of the actor. (Table 1).

**Table 1.** Description of actor

<b>Actor</b>	<b>Description</b>
Admin	Have rights over all access to the data that exist on the system as a whole.
Lecturer	Have the right of access in entering grades and viewing course grades
Student	Have the right to see transcript of value, study result card, and completion of study plan

1) *Use Case Diagram for lecturer*

Menus was created for lecturers' services are lecturers' menus, courses, grades and students. Lecturers do login first by filling in the default username and password. After login, the lecturer can access the menu on the lecturer's page. Lecturer can change the username and password on lecturers edit menu (user). In addition, lecturers can see and print the schedule of courses that diampuh. Lecturers can also access the students' grades along with the names of students who program the courses taught.

2) *Use Case Diagram for Student*

The menu display for students includes students, lecturers, courses and grades. Students login first by filling the default username and password. After login, students can access the menu on the faculty page. Lecturer can change the username and password in the student edit menu (user). In addition, students can view and print course schedules, faculty pengampuh, and transcripts of value. And do inpur the Card Study Plan.

b. Activity Diagram

Activity diagram is a technique to describe procedural logic, business process, and work path. In some cases, the activity diagram is almost identical to a data stream. The principle difference between the activity diagram with flow chart notation that activity diagram more support to behavior parallel.

### 4.3 Develop

Based on user needs and requirements of the development of information system model, the researcher develops a system model with the following description:

- a. The system consists of three user levels, admin, lecturer, and student. Each user obtains the user account along with the default password used in accessing the application in the form of an android based information system.
- b. The system displays the menu according to the needs of each user
- c. Admin has full access rights in managing admin data, student data, lecturer data, value data, etc.
- d. The lecturer has access to input, edit, and delete values.
- e. Students have access in the form of charging KRS, download Transcript and Card Study

### 4.4 Result Implementation

Implementation is a test of system view on smartphone. This system consists of various forms of pages. Various forms of display are presented in the figure 2.

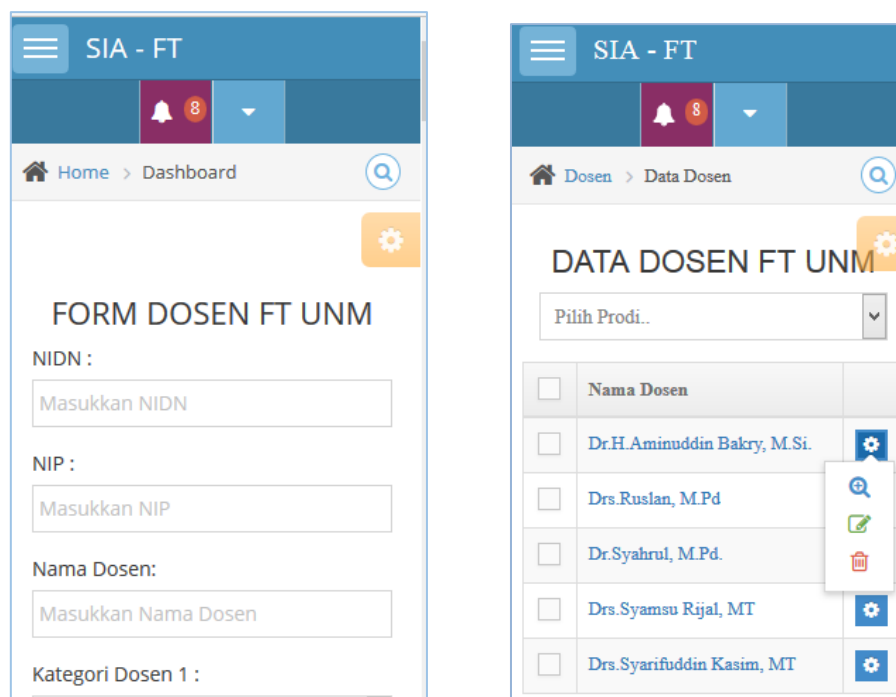


Figure 2: Display of System

### 4.5 Evaluation

Black Box testing method with Equivalence Partitioning method to find out whether the system or application can run properly. Selection of this method is done to be able to find fault on application function, application interface, and application data structure error. Thus the input and response received accordingly, resulting in a match between the user and the application. Table 2 presents the model test instrument

Tabel 2: The testing of Model

Focus	Testing	Scenario	Expected Result	Result
Versi Android	Test compatibility version of android operating system	Testing on android version 5.0 (Lollipop)	Compatible with android operating system version 5.0 (Lollipop)	Suitable
		Testing on android version 6.0 (Marshmallow)	Compatible with android operating system version 6.0 (Marshmallow)	Suitable

The results of testing the implementation of academic-based information systems involving 30 students and 10 lecturers at the Faculty of Engineering UNM result that this

system is very effective, accessible with smartphones and attractive presentation. Thus, it can be concluded that the built system shows high effectiveness.

## 5.0 Conclusion

Based on the results of discussion and analysis, it can be taken some conclusions as follows:

1. The design of academic android based information system is done through the steps are: 1) preliminary study / needs analysis done to obtain various academic information faculty of engineering and other information required 2) Analysis of information systems that are running and 3) Analysis of design as well database design.
2. System of academic-based information android Faculty of Engineering Universitas Negeri Makassar is feasible to be used based on black box testing.

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# **Relation between Physical Condition and the Incidence of Pneumonia in Children Under Five in Urban Village in Palu, Central Sulawesi, Indonesia**

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## **Abstract:**

Pneumonia was dubbed as a major assassin of infant mortality, and under five in Indonesia, estimated pneumonia deaths in Indonesia reached five cases among 1000 infants / children under five die each year, or 12,500 casualties mount or 416 cases a day. Home and neighborhood sanitation is closely related to the incidence of infectious diseases, especially respiratory infections, house window does not meet the requirements, the house is damp and the walls and the morning sun is difficult to enter the house also easier for children stricken with pneumonia. This study aimed to know the relationship ventilation, humidity, natural lighting and the type of floor with the incidence of pneumonia in children under five in Palu City. This type of research case-control analytic approach, done at East Palu, District with a sample of 63 cases and 63 controls. The analysis used were univariate and bivariate with the chi-square test. The results showed that there is three physical house variable associated with the incidence of pneumonia disease in children under five in the city of Palu. The variables are the condition of home ventilation, natural lighting, and humidity. While the type of floor of the house is not associated with the incidence of pneumonia in children under five. The results of this study illustrate that people who have a habit to open windows every day can reduce the risk of pneumonia. The condition of the open window produces good air circulation and low humidity, thus preventing culture of germs.

**Keywords :** The physical condition of the house, and the incidence of pneumonia in children under five

## **1.0 Introduction**

The purpose of health development in Indonesia aims to provide health services to obtain healthy living ability for society in order to realize the optimal health status. Indicators of a community's health status can be seen from the healthy level, sickness, and death of the population. Mortality and disease incidence rates for unhealthy household residents are usually dominated by diseases caused by germs, such as pneumonia.

Pneumonia is a disease often reported as the 10 major diseases in developing countries. According to a 2008 World Health Organization (WHO) report, pneumonia deaths worldwide are around 19% or around 1.6 to 2.2 million, of which about 70% occur in developing countries, especially in Africa and Southeast Asia. Data WHO 2016 showed that the worldwide death rate from pneumonia in children under 5 years of age is as significant. 15%. Data in Indonesia shows that the death of pneumonia in Indonesia reaches five cases among 1000 babies / toddlers die each year, or 12,500 victims per month or 416 cases. Pneumonia or



respiratory infection due to household conditions such as malnutrition, overcrowding, parental smoking and household air pollution.

Inadequate ventilation of the house affects the health of residents. The obstructed air exchange from outside into the house cause the increased risk of disease caused by bacteria. Inadequate ventilation also causes increased humidity of the room due to the process of liquid evaporation from the skin. Therefore high humidity of the room will be a suitable medium for the proliferation of bacteria that cause disease Pneumonia. The house with limited air exchange has bad air conditioning as a result of kitchen smoke or cigarette smoke.

The infants and children who often smoked the smoke in the home more susceptible to upper infection respiratory tract. Furthermore, the humidity condition of the house also allows children attacked by Pneumonia. In Chine, the incidence childhood pneumonia with high prevalence associated with ambient particulate air pollution and house condition.(Havens, Jary, Patel, Chiume, & Mortimer, 2015)(Jiang *et al.*, 2018). Furthermore, the reduced housing conditions in households indicated that limited access to clean water and humidity of home-related to the health status of the family.(Tasnim, Dasvarma, & Mwanri, 2017).

This study aims to reveal the relationship between the condition of the home with the incidence of pneumonia in children under five in the city of Palu. Location of study in East Palu District as the region with the highest incidence of Pneumonia in 2017.

## 2.0 Method

This research is observational analytic research with case-control approach. The research was done by direct observation in the field and measurement using the tool, then the data were analyzed by Univariate and Bivariate analysis by using Chi-Square test to find out the relationship between ventilation, humidity, natural lighting, and type of floor with the incidence of pneumonia, the data in this study is presented in the form of tables and narratives about everything related to research.

## 3.0 Result and Discussion

### 3.1 Univariate Analysis

This analysis is conducted to determine the frequency distribution of each of the variables studied, both independent and dependent variables (Table 1)

**Table 1.** The Sample Characteristic by Univariate Analysis

Variable	Category	Frequency	Percentage
Age	1-12 months	21	16,7
	13-24 months	18	14,3
	25-36 months	32	25,4
	37-48 months	46	36,5
	>48 months	9	7,1
Gender	Boys	70	55,6
	Girls	56	44,4
Conditions of home ventilation	Eligible	91	72,2
	Not Eligible	35	27,8

Variable	Category	Frequency	Percentage
Conditions of home Natural Lighting	Eligible	84	66,7
	Not Eligible	42	33,3
Humidity	Eligible	104	82,5
	Not Eligible	22	17,5
Type of home floor	Eligible	113	89,7
	Not Eligible	13	10,3

Table 1 shows that the age of children with the highest frequency is 37-48 month age group of 46 people (36.5%) and the least are age group > 48 months as many as 9 people (7.1%). Most of the male sex were 70 (55.6%), and women were 56 (44.4%). The condition of the toddler's house is generally well viewed from home ventilation, natural lighting, humidity and the type of floor that generally qualifies.

### 3.2 Bivariate Analysis

The bivariate analysis aims to obtain the relationship between independent variables and dependent variables. (table 2)

**Table 2:** Bivariate analysis of house conditions and the incidence of pneumonia

Variable	Category	Sufferer (%)	Unsufferer (%)	P-value	Conclusion
Conditions of home ventilation	Eligible	44	56	0.047	Condition of home ventilation related to the incidence of pneumonia
	Not Eligible	65.7	34.3		
Conditions of home Natural Lighting	Eligible	45.2	54.8	0.035	Condition of home natural lighting related to the incidence of pneumonia
	Not Eligible	72.7	27.3		
Humidity	Eligible	42.9	57.1	0.038	Condition of home humidity related to the incidence of pneumonia
	Not Eligible	64.3	35.7		
Type of home floor	Eligible	46.9	53.1	0.079	Type of home floor did not relate to the incidence of pneumonia
	Not Eligible	76.9	23.1		

## 4.0 Discussion

### 4.1 The Relationship of Ventilation with the Incidence of Pneumonia in Children Under Five

The result of statistical analysis with Chi-square test for the relationship of house ventilation with the incidence of pneumonia disease in children under five resulted in  $p = 0,049$ . The value is smaller than a value (0.05). It concludes that there is a relationship between home ventilation with the incidence of pneumonia disease in children under five. The ventilation area is not eligible caused the room does not allow for good air exchange, and the airflow inside the room remains fresh. Based on observation of window researchers at home respondents are not opened on average and still a lot of windows on the home of respondents made of glass that can not be opened, so the process of air exchange in the house is not lancer, and there is also a small size is the size of ventilation is recommended should be 10% floor area.

#### ***4.2 The Relationship of Humidity with the Incidence of Pneumonia in Children Under Five***

The result of statistical analysis with Chi-square test for house humidity relationship with the incidence of pneumonia disease in children under five obtained p-value = 0.031 is smaller than a value (0.05). Thus there is a significant relationship between house humidity with the incidence of pneumonia disease in children under five. Respondents affected by pneumonia had a house-eligible moisture of 104 homes (82.5%) and unsuitable house humidity of 22 houses (17.5%). Humidity is considered reasonable if it meets 40-60% and is bad if it is less than 40% or more than 60%. The observation of humidity researchers that less or more air humidity in the home becomes a good medium for the growth of bacteria that cause pneumonia.

Humid houses allow rats and cockroaches to carry bacteria and viruses that can all play a role in triggering respiratory illness and can multiply within the home (Korelia, 2017)

#### ***4.3 The Relationship of Natural Lighting with the Incidence of Pneumonia in Children Under Five***

The result of statistical analysis with Chi-square test for the correlation between natural lighting in the house with the incidence of pneumonia disease in children under five, got p-value = 0,039 smaller than value 0,05. The analysis result indicated that there is a significant correlation between house lighting with the incidence of pneumonia disease at the toddler. Respondents affected by pneumonia had house lighting that fulfilled the requirements of 84 houses (66.7%) and unfit house lighting for 42 houses (33.3%). According to observation resulted that natural lighting in the home is closely related to the window size. Small window size does not allow the entry of sunlight into the house. The lack of sunlight that enters the house is a good place to live and breed the seeds of disease. The home with sufficient lighting, both natural light (sunlight) and artificial light can affect air humidity. In addition, Sunlight is very important for human health, because it can kill pathogenic bacteria in the house., (Krieger & Higgins, 2002)

#### ***4.4 Relationship Type of Floor with the Incidence of Pneumonia in Children Under Five***

The result of statistical analysis with Chi-square test for the relationship between the house floor and the incidence of pneumonia disease in children under five obtained p-value (0.079) higher than the value of a (0.05). The result indicated that there is no significant relationship between the house floor with the incidence of pneumonia in toddlers. Respondents exposed to pneumonia had eligible home floors of 113 houses (89.7%) and unqualified home floors of 13 houses (10.3%). The result of observation at the research location shows that most of the houses have the floor with the low quality concrete material. This material is easily broken and damaged and potentially produce dust in the house.

The incidence of pneumonia is strongly associated with bacterial growth in an environment. Houses with low air ventilation can allow the rapid development of bacteria. Dust in a house containing bacteria is difficult to circulate with the outside air under the proper ventilation conditions. The dust contained in the room contains about 5 million bacteria per gram. Bacteria that often float in the air are bacteria that live in the human respiratory tract released by sneezing, coughing, breathing or while talking. Pneumonia and

tuberculosis are potentially contagious in the home with conditions that do not meet health requirements.

## 5.0 Conclusion

The results showed that there is three physical variable house associated with the incidence of pneumonia disease in children under five in the city of Palu that is the condition of home ventilation, natural lighting, and humidity. While the type of floor of the house is not associated with the incidence of pneumonia in children under five. The results of this study illustrate that people who have a habit to open windows every day can reduce the risk of pneumonia. The condition of the open window produces good air circulation and low humidity, thus preventing culture of germs.

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# Farmer Knowledge about Sustainable Agriculture in Soppeng Regency, South Sulawesi, Indonesia

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## Abstract:

The knowledge of farmers is beneficial and support the ability to adopt technology in its farming business. The higher the level of knowledge the mindset of farmers will also be more extensive. Conversely, the low level of knowledge of a farmer is one of the inhibiting factors in the development of agricultural sector. The high level of knowledge of farmers can also support in sustainable agriculture. This study aims to obtain a description of farmers' knowledge about sustainable agriculture in Soppeng District. The type of this research is quantitative descriptive by using 100 farmers as a sample. The technique of collecting data by using questioner. Research results showed that farmers' knowledge about sustainable agriculture is high (score 0.55). Farmers have a high knowledge of superior seeds, while knowledge of irrigation farming is low.

**Keywords:** Soil processing, Fertilizers, Pesticides, Superior Seeds, Irrigation

## 1.0 Introduction

Increased production that supports food security characterizes the role of agriculture as a mainstay of the national economy. The policy of increasing rice production has been rapidly achieved by farmers with the application of modern agricultural technology. The policy of the Government of Indonesia through Agriculture Ministry of Indonesia Government related to the increase of agricultural production is *Panca Usaha Tani* consisting of five types of business namely: tillage, fertilization with artificial fertilizer, repair of irrigation network, superior seed planting, and pest and disease control with pesticide.(Elizabeth, 2017; Suryana, Daud, & Irawan, 2016)

Sustainable agriculture development as a safeguard not only takes into account the needs of today's society. However, this concept also considers aspects of preserving the carrying capacity of the environment. Thus, agricultural development should build harmony between the fulfillment of needs with the conservation of land resources. Implementation of sustainable agriculture development in Indonesia is not easy because it is faced with many obstacles. Firstly, On the aspect of human resources, the level of education of farmers is relatively low, and the productivity of work and motivation are lacking. Still low. Secondly, natural resources. The availability of volumes of fluctuating water accompanied by the quality of land productivity also decreases. Thirdly, the constraint of technological applications that agricultural activities are only supported by technologies that are not environmentally friendly such as the use of fertilizers and chemical pesticides (Flor *et al.*, 2016; Warnaen & Cangara, 2016).

Sustainable agriculture which is the principle of land management that supports the preservation of ecological quality. This concept is an integrated system with the objective to

meet the needs of human food, to maintain the quality of the environment and natural resources, to use natural resources efficiently and to improve the quality of life of farmers and communities whole.

The knowledge of farmers is beneficial and support the ability to adopt technology in its farming business. As an assumption that the higher the level of knowledge and the mindset of farmers the wider of access to adopt of technology. Furthermore, the low level of knowledge of a farmer is one of the obstacles in the development of the agricultural sector, with the high level of knowledge of farmers can also support in the management of agricultural land that does not damage the surrounding ecosystems.

A person's knowledge is defined as knowledge and perception which is a combination of real experience of an object with related information from other sources. Knowledge is everything that includes memories of things that have been learned and stored in memory. This may include facts, rules, and principles, as well as known methods (Winkel, 2009).

Soppeng Regency is one of the areas in South Sulawesi Province that has potential in the development of agriculture and livestock sector. Area of 150,000 ha mostly in the form of an agricultural area that is 42% is rice field and 21% in the form of a garden. This fact shows that most of the people in this region work as farmers. The pattern of rice production is generally influenced by the practice of land intensification. Farmers generally use fertilizers and pesticides intensively to produce optimal production. Also, the support of irrigation facilities is also an essential part of the agricultural business.

Pesticides are chemicals used to eradicate pests that can increase farmers' crop yields. The use of pesticides by farmers is increasingly increasing, but not balanced with an increased understanding of farmers in using pesticides. The impact of the use of pesticides is pollution of water, soil, air, and impact on the health of farmers, farm families and consumers (Yuantari *et al.*, 2013).

The use of pesticides and fertilizers in agriculture is in fact proven to reduce the number of pests and increase the fertility of plants. However, with the provision of chemical fertilizers and pesticides can also cause various negative impacts on plants and especially for humans. With the excessive use of pesticides and fertilizers in plants can lead to deposits of chemicals present in fertilizers and pesticides that eventually become residues on soil and plants (Tarumingkeng, 2008).

This study outlines the limitations of human resources in farming in Soppeng Regency, which refers to the policy of the five farming enterprises. The study variable is the level of knowledge of farmers in supporting sustainable agriculture in Soppeng District.

## **2.0 Research Method**

This type of research is descriptive quantitative as an effort to get the portrait in a systematic, factual and accurate. The sampling technique is using the proportional random sampling method or the sample determination based on the number of farmers in the area. The sample selected in this study is 100 farmers with the assumption that the sample data is a comparable data. The data collection used is a test instrument to measure farmers knowledge about five aspects: soil processing, fertilizer, superior seeds, pesticides and irrigation maintenance. Assessment of respondents' answers is between the values of 1 to 4.

Data analysis with a scoring technique that is a comparison between the value of respondent with maximal value. The knowledge scores are divided into four categories (table 1).

**Table 1:** Knowledge category

Score	Category
0.00 - 0.25	very low
0.26 - 0.5	low
0.51 - 0.75	high
0.76 - 1.00	very high

### 3.0 Result and Discussion

#### 3.1 *Farmers Knowledge about Soil Processing*

Soil processing methods that support sustainable agriculture are building the stability of topsoil, the presence of soil organisms and maintaining organic matter on the land. The knowledge of the farmers on the methods of soil processing is presented in the table:

**Table 2:** Farmers Knowledge About Soil Processing

Grade	Frequency	Freq × Grade
4	4	16
3	16	48
2	67	134
1	13	13
<b>Total</b>	100	211
Score = $211/400 = 0.53$		

The result of grade calculation shows that most of the respondent have grade 2 (two) is 64%. Respondents with the highest grade are only 4%. This analysis shows that farmers' knowledge is relatively low. The score calculation shows that farmer knowledge about land management is 0.53 or with the high category. However, this value tends to approach the low category.

#### 3.2 *Farmers Knowledge about Fertilizer Usage*

The use of fertilizer in sustainable agriculture is to prioritize the potential of land as a soil fertilizer, the optimal use of organic fertilizer and knowledge of compost and manure. The knowledge of the farmers on the methods of soil processing is presented in table 3.

**Table 3:** The Farmer's Knowledge about the fertilizer Usage

Grade	Frequency	Freq × Grade
4	8	32
3	23	69
2	56	112
1	13	13
<b>Total</b>	100	226
Score = $226/400 = 0.57$		

The analysis in table 3 indicated that there are 56% of respondents who have an average grade of 2 (two). The highest grade respondents were only 8%. The level of knowledge of farmers about fertilizer showed a score of 0.57 or high category. However, the value of fertilizer knowledge shows a tendency to approach the low category.

### 3.3 Farmer's Knowledge about The Superior Seeds

Superior seed is an essential factor in achieving land productivity. The use of superior seeds aims to obtain plants resistant to pest attacks and potentially produce a lot of fruit and quality. Farmers' knowledge of the purpose of using superior seeds and how to recognize them is presented in table 4.

**Table 4:** The Farmer's Knowledge about the superior seeds

Grade	Frequency	Freq × Grade
4	15	60
3	31	93
2	46	92
1	8	8
<b>Total</b>	100	253
Score = $253/400 = 0.63$		

The results of the analysis in table 4 indicate that farmers know the purpose of using superior seeds and how to recognize them. Most respondents with grade 2 (two) were 46%, but there were 31% of respondents with grade 3 and 15% with grade 4. Generally. A score of farmers knowledge about superior seeds is 0.63 or with the high category.

### 3.4 Farmers' Knowledge about Pesticide Use

The use of pesticides in agricultural activities aims to control plant-disturbing organisms. Proper use of pesticide begins with the introduction of plant pests, knowledge of biological control of pests and selective use of pesticides. The result of farmer knowledge about pesticide is presented in table 5.

**Table 5:** Farmers' knowledge about pesticide usage

Grade	Frequency	Freq × Grade
4	6	24
3	20	60
2	62	124
1	12	12
<b>Total</b>	100	220
Score = $289/400 = 0.55$		

Based on the data in table 5. then most respondents do not understand the technique of using pesticides is the highest frequency of grade 2 as much as 62%. There are even 12% of farmers with grade 1. The score of knowledge score is 0.55 indicates a high category for pesticide knowledge.



### 3.5 Farmer's Knowledge about Irrigation

Irrigation management in sustainable agriculture activities is characterized by careful water utilization, water regulation techniques and cropping patterns appropriate to water availability. Farmers with knowledge about irrigation will support sustainable agriculture systems. Table 6 shows the analysis of farmers' knowledge of irrigation.

**Table 6:** Farmer's Knowledge About Irrigation

Grade	Frequency	Freq × Grade
4	6	24
3	24	72
2	30	60
1	40	40
<b>Total</b>	6	196
Score = $196/400 = 0.49$		

Frequency analysis shows that there are 40% of respondents with grade 1 or lowest knowledge. The result of the score analysis shows that the farmers' knowledge about agriculture is 0.49 or low category.

This study reveals the level of farmers' knowledge of sustainable agriculture. The results of the farmer knowledge analysis are presented in table 7.

**Tabel 7:** The summarize of Farmer's Knowledge

Knowledge	Score	Category
soil processing	0.53	High
Fertilizer	0.57	High
superior seeds	0.63	High
Pesticides	0.55	High
irrigation maintenance	0.49	Low
<b>Average</b>	<b>0.55</b>	<b>High</b>

Table 7 shows that the average value of farmers knowledge is 0.55 or high category. In the five variables studied, the highest knowledge is knowledge of superior seeds and the lowest knowledge on irrigation maintenance. This fact shows that the government can make programs related to the optimal utilization of irrigation utilization.

## 4.0 Conclusion

Knowledge of farmers in supporting sustainable agriculture in Soppeng Regency in the high category. Supporting factors of knowledge level are supported by knowledge of superior seeds. The results of this analysis into consideration for the government to create a program of sustainable agriculture development based on community participation.

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# **Thinking Critically in Science: Why does it matter?**

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## **Abstract:**

Malaysia education system undergoes curriculum transformation to equip students with necessary skills for the 21st century such as critical thinking and problem solving. Enhancing students' higher order thinking skills is the main goal in science curriculum in Malaysia. Critical thinking is a part of higher order thinking skills, and previous findings showed that concept of critical thinking skills is still vague. Thus, there is a need to discuss higher order thinking skills and one of its element, critical thinking and its importance in science.

**Kata kunci:** Higher Order Thinking Skills, Critical Thinking, Science

## **1.0 Introduction**

Malaysia introduced new curriculum transformation to ensure that the education system is relevant with the 21st century learning, and also to be globally competent. The new curriculum aimed to produce students not only knowledgeable but also have thinking skills. To achieve those aspirations, higher order thinking skills are introduced in the learning process. Applying, analyzing, evaluating, and creating are higher order thinking skills based on revised Bloom's Taxonomy by Anderson. Higher order thinking skills are infused in teaching and learning in classroom which the focus are based on inquiry-based learning, problem solving, contextual learning, collaborative learning, project-based learning and STEM approach (Ministry of Education, 2016).

Higher order thinking skills are relatively new in the field, which is why the concepts of higher order thinking and one of its element, critical thinking is still vague. Thus, there is a need to discuss further in details the component of higher order thinking skills and critical thinking and its relation with science curriculum. This article also discusses a conceptual framework by Tajudin and Chinnappan (2016) on the link between higher order thinking skills, representation, and concept in enhancing TIMSS task. Since Malaysia participated in TIMSS which focused on the content and cognitive aspect of the students, the study is aligned with Malaysia's new curriculum transformation, to produce quality students and also globally competent.

## **2.0 Issues of critical thinking in science classroom**

### **2.1 Teaching HOTS in classroom.**

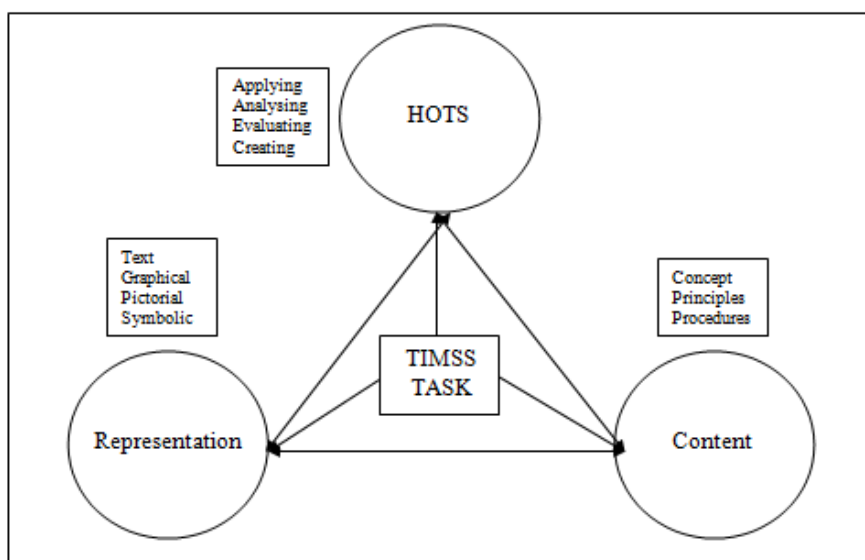
Higher order thinking skills in Malaysia are based on the revised Bloom's Taxonomy (Ministry of Education, 2016a). The level of thinking in the revised Bloom's Taxonomy are classified into two category, lower order thinking skills (LOTS) and higher order thinking

skills (HOTS). The detailed descriptions of Lower Order Thinking Skills and Higher Order Thinking Skills are shown as Table 1 below:

**Table 1:** Descriptions of Thinking Skills (Ministry of Education, 2016a)

Level	Thinking skills	Descriptions
HOTS	Creating	To produce idea or product or method creatively and innovatively
	Evaluating	To make judgment and decision based on knowledge, experience, skills, and values, and give justification
	Analysing	To break down information to small section to understand deeper and to have interrelationships between the sections
	Applying	To use the knowledge, skills and values in different situation to do something
LOTS	Understanding	To recall the information and can explain ideas and concept
	Remembering	To recall the information, facts, and concept

Tajudin and Chinappan (2016) made a conceptual framework on higher order thinking skills in Malaysian context. The conceptual framework represents three constructs in the study that are interwoven and interdependent on each other. It shows that in HOTS are important skills needed for the students to connect with relevant Content and applying the information during the construction of Representation, and this relationship are required to be understood in order to solve problems such as those from TIMSS assessment. Interesting enough, TIMSS task can be replaced with any problems or assessment in school, while maintaining the relationship between the three constructs (HOTS, Content, Representation).



**Figure 1:** Link between HOTS, Content, and Representation in TIMSS Task (Tajudin and Chinnappan, 2016)

Higher Order Thinking Skills allows students to solve problem effectively, however it must be aligned with knowledge to ensure students able to understand the content and apply in the learning process. A study by Tuan Lasan, Che Noh and Hamzah (2017) on higher order thinking skills in Tasawwur Islam has showed that teachers that focused on the skills in

learning process able to increase students' understanding on the subject. Repeated exposure of higher order thinking skills in the learning process allows students to master the content, because it stimulates students to think and also motivate students to learn.

In the context of chemistry, for example in Chemistry SPM 2016 question (Tee, 2017), a higher order thinking skills question required students to explain for a reason on why a particular substance is suitable to remove nail polish, and at the same time make a justification why this substance is more suitable for the problem compared to another substance in a context of chemistry principle. It is clear that critical thinking must be employed to give explanation for the arguments given within the context of chemistry such as analysing the different structure of the substances, and later making an explanation for the answer. It is also clear that in order for student to answer the question based on the context of chemistry, cognitive skills of critical thinking and content are interdependent. Thus, it is important to have a clear view on the cognitive skills and its link to the content. This is because based on the conceptual framework by Tajudin and Chinnappan (2016), the focus of the framework is on higher thinking skills and critical thinking can be said as one of the element in higher order thinking skills (Mohd Zhaffar, Hamzah & Abdul Razak, 2017). So, what is critical thinking, and how critical thinking relates to higher order thinking skills?

In mathematics, representation can be shown in a form of symbols, diagrams, and figures. Representation varies from one context to another, depending on the problem. Similar to chemistry, representation can be illustrated as those points of Representation in Figure 1. For example, in SPM 2013 Chemistry Paper 2 (Tee, 2017), the question asked student to solve a problem about rusted key. In order to solve this problem, students must be able to understand the concept of electrolysis, and draw appropriate diagram to solve the problem.

### 3.0 Definition of Critical Thinking

Sternberg (1986) defined critical thinking as a mental process, strategies, and representations people use to solve problems, make decisions, and learn new concept. Critical thinking is a mode of thinking, with a set of cognitive skills: Interpretation, Analysis, Evaluation, Inference, Explanation, and Self-regulation (Facione, 1990). According to Edward (1941), critical thinking comprises of three elements: skills, attitude, and knowledge. Some authors explain critical thinking skills as follows (Facione, 1990; Masek and Yamin, 2011):

1. Interpretation=clarifying meaning through categorization and translation
2. Analysis=identifying and examining ideas and arguments
3. Evaluation=assessing arguments
4. Inference=drawing conclusion
5. Explanation=justifying results, arguments and procedures
6. Self-regulation=reflection and self-assessment

In summary, critical thinking is a higher order thinking skills that require the thinker to think critically with by analysing the context with the support of evidence (Yuretich, 2004). Good critical thinker makes decision and judgment better in complex situation (Gabbrill, 2006). As critical thinking is dependent on the memory, this process is not possible without prior knowledge in certain content (Krathwohl, 2002). Thus, in short, critical thinking is a set

of cognitive skills, with appropriate knowledge that can help in reaching the best solution needed to solve problem.

A qualitative study on teachers' definition of critical thinking conducted by Choy and Cheah (2009) has reported that teachers perceived critical thinking in two different ways. The teachers perceived critical thinking as a method of thinking, which the teachers perceived critical thinking as a tool for students' learning to achieved better learning outcomes. Meanwhile, another teacher perceived critical thinking as a reasoning which helped students analyze their learning. Both perceptions showed that critical thinking's definition are rather vague (Yen & Halili, 2015), hence the confusion in integrating critical thinking in the classroom.

Another case study conducted by Sulaiman *et al.* (2017) on teachers' perspective on critical thinking in science classroom. One teacher analysed students' critical thinking based on "analyzing skill, following procedure, interpreting data, and making conclusion". Meanwhile critical thinking involves interpretation, analysis, evaluation, and inference (2014). Another study by Choy and Cheah (2009) stated teacher perceived critical thinking as a method to maximize outcomes or results, and involved logical reasoning, compare and contrast. Meanwhile another participant stated that critical thinking helped students to analyze information and solve problems (pg. 201). The ongoing issue on the element of critical thinking skills must be addressed to avoid further confusion and misconception, especially during learning process and assessment.

#### **4.0 Assessment**

Malaysia participated in Trends in International Mathematics and Science Study (TIMSS), an international assessment focusing on assessing students' performance in science. TIMSS assess two domains; content (Chemistry, Physic, Biology, and Earth Science), and cognitive (knowledge, application, and reasoning). In 2011, the performance reached lowest score of all history of participation in TIMSS, but has showed significant increase in 2015. Despite that, in depth investigation on students performance in Science in TIMSS 2015 showed that Malaysian students are still below the average score set for international benchmarking. More disappointing statistic is shown in the TIMSS 2015 report by Ministry Of Education (2016) that students' performances in both domains (cognitive and content) are at below the average score. These results suggested that students able to understand basic concept in science, however when it comes to problem solving task, Malaysian students are unable to transfer knowledge to the problems given.

Due to disappointing results in TIMSS 2011, the government has introduced and implemented new curriculum, with emphasis on higher order thinking skills in the lesson. One of transformation in the curriculum is in the aspect of pedagogy. Education system for secondary school in Malaysia has shifted from rote learning and memorizing contents towards emphasizing higher order thinking skills. Higher order thinking skills (HOTS) is the ability to apply knowledge, skills and values in reasoning and reflection to solve problems, making decision, innovation and able to create something new (Ministry if Education, 2016). HOTS are skills that are taught in classroom to enhance critical thinking among students. Especially in Science and Chemistry, skills in HOTS such as Analyzing and Evaluating are very important to reach conclusion and solve problems, which the cognitive skills of higher order thinking skills are align with the cognitive skills of critical thinking by Facione (1990) and Masek and Yamin (2011). Accordingly, if cognitive skills were to align with higher order

thinking skills, it is clear that the link between critical thinking skills, content, and representation are also interdependent as the conceptual framework proposed by Tajudin and Chinnappan (2016) illustrated in Figure 1.

There are numerous studies by previous researchers that incorporated critical thinking in teaching strategies using project-based learning and problem-based learning which improves students' critical thinking (Garcia, 2016; Mapeala & Siew, 2015; Sulaiman, 2011). There are also studies found in the databases mainly focused in international perspectives (Mohammed Saldo *et al.*, 2015; Alosaimi, 2013; Paideya, 2011; Gunn *et al.*, 2008; Bolstad & Hipkins, 2005), which their curriculum is different from Malaysia education system. Findings on higher order thinking skills and critical thinking in science in Malaysia context are rather limited, and mostly focuses on different subject such as Tasawwur Islam (Tuan Lasan, Che Noh & Hamzah, 2017), Mathematics (Tajudin & Chinnappan, 2016; Shamsuddin, Ruzlan & Siti Noor, 2016). With the government implementing HOTS in Chemistry and Science classroom, it will be interesting to study how students use critical thinking skill to answer questions.

### **5.0 Effect of critical thinking in science classroom**

Integrating critical thinking in science education will helps students to become more active and responsible with their learning (Kogut, 1996), where they are able to reflect on what they learnt, and be responsible with their learning (Paideya, 2011). However, teaching science can be challenging due to its tremendous amount of concepts and principles needed to be understand (Sulaiman *et al.* 2017), which can lead to teacher's dominance in the process of learning is also the cause of dwindling motivation to learn the subject (Naor, 2014, Ibrahim *et al.* 2017). Science and Chemistry are taught in school to produce students with knowledge and skills in the subjects. Students with conceptual understanding in science education can demonstrate critical thinking that can be used to solve problems including laboratory measurement (Holme *et al.*, 2015). Application of the knowledge and skills can help students to make decision and solve problems, within the context of the subject and more importantly in life. As a result, the students will be able to overcome challenges and difficulties and also becomes a critical knowledge society.

### **6.0 Conclusion**

The chemistry-oriented critical thinking skills are vital in establishing critical scientist, as well as producing quality society especially at the age of internet where there are boundless information can be found. Integrating critical thinking skills in a already-implemented higher order thinking skills in a difficult and abstract subject such as chemistry can provide not only basic knowledge to the students, moreover integrating the skills in the subject can help students to solve problems related to chemistry itself, and real life problem in general. In this paper, a discussion on the role of critical thinking using suitable cognitive skills is presented to understand the link between Chemistry content and the cognitive skills of critical thinking. Through selected chemistry problems, critical thinking skills and its role in solving the problem is highlighted.

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# Scientific Reasoning Skills And Stem Education: Why, When, How?

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## Abstrak:

The education system has become an important tool to produce an individual with multiple talents and knowledge. In order to be all rounded and excellent performing student, it is important for students to acquire scientific reasoning skill. Students are able to manipulate science concept they learn if they acquire scientific reasoning skill. Students will master what they have learned and apply in daily life with this skill. One of the learning approaches integrates the content knowledge and skill to find a solution for real world problem is STEM learning. Science, technology, engineering and mathematics (STEM) aims to produce students with good quality to compete in real world challenges. One of the core elements of STEM is scientific reasoning skills. There are numerous research has been done to measure students scientific reasoning skills through several available establish instruments. This paper will discuss about scientific reasoning skills in STEM education. The study finds that it is important to develop scientific reasoning skill among students. It is also important to measure if students have acquired the scientific reasoning skill. Assessment is the bridge between teaching and learning. Thus, an accurate instrument is needed to measure students scientific reasoning skill.

**Keywords:** Scientific reasoning, Science, Malaysian student, Assessment, STEM

## 1.0 Introduction

It was the vision of the Malaysian government to be developed country by 2020. The vision can be achieved by producing more individuals with the expertise of science and technology (Hamdan, 2012). Malaysian education system since then, giving importance and priority in developing scientifically talented individuals (Nor Ain, 2016). Aligned with this aim, the Malaysian Science Integrated Curriculum focusing on improving students thinking, reasoning skill at a deeper level. Since 2010 Malaysian education has introduced the scientific reasoning skills in science curriculum (Suhaimi, 2010).

Science is one of the main subjects taught in Malaysian schools starting from primary one to tertiary education. In the beginning stage, science is taught in basic skill involves reading, writing and arithmetic and move forward to other skills in deeper stage. The main objective of science education is to produce scientifically literate individuals (Hand, 2010). The current curriculum emphasizes the involvement of students in learning science content (Chen, 2011). Students must possess scientific reasoning skills in order to actively involved in the learning process.

In international assessment such as Trends in Mathematics and Science Study (TIMSS) and Programme of International Student Assessment (PISA), performance of Malaysian students are not in the satisfactory level. The results indicated only 2-10% of the students

excelled in solving problems that are abstract and able to make conclusion (Mullis, 2012). According to Mullis report, 60% of the students are in low international benchmark. It can be interpreted that Malaysian students have difficulty in transferring their knowledge to situational questions. In a study conducted by Osborne (2013) it revealed that science students showing lower levels of thinking skill. This is aligned with the statement released by the National Science Foundation (2010) stating students not able to solve real world problems due to lack of science literacy or scientific reasoning skill.

TIMSS assesses students' thinking skills in three main cognitive domains, namely knowing, applying and reasoning (Mullis, 2012). According to Gonzales (2008), sixty percent of the assessment is covered by applying and reasoning domains. It would be difficult for students with inadequate scientific reasoning skills to solve the assessment. PISA is another international assessment for students aged fifteen years, which measure students scientific reasoning skill (OECD, 2013). Students should be able to understand the science issues, explain the issue scientifically and draw a reasoning for the issue.

## **2.0 STEM Learning and Scientific Reasoning Skills**

STEM is a learning approach which combined the aspect of science, technology, engineering and mathematics (Gerlach, 2012). The approach of STEM requires students to solve problem using inquiry methods, design and research. Creativity and curiosity to learn can be nurtured through the approach of STEM (Lou et al., 2017). STEM learning requires the skills of problem solving and reasoning. STEM learning fosters students to think critically. The integration of content and skill of science can be seen in STEM approach. Students need to utilise the content they learn from science, technology, engineering and mathematics to find solution for the given tasks.

To achieve the objective of STEM learning students should have scientific reasoning skill. Students should use their ability to identify a problem, analysis the evidence and draw a suitable conclusion. According to Bao (2009) scientific reasoning skill is important for students of science, technology, engineering and mathematics to handle real world tasks. Students need to involve themselves in series of investigation to understand the issues and challenges given to them. They engage themselves in scientific reasoning to find the solutions. They analyse the issue, use the content of STEM and create innovative solutions..

## **3.0 What is Scientific Reasoning Skill?**

Scientific reasoning skill can be defined as a process of reasoning a science concept which involves understanding a concept or situation (Curriculum Development Center, 2012). Scientific reasoning requires students to draw inference based on observation, facts and assumptions. Lawson (2004) describes the scientific reasoning as a process of deriving a conclusion beyond direct experience. According Hand (2001) scientific reasoning involves understanding of the concept and construct knowledge. Scientific reasoning is defined as 'formal reasoning' or 'critical thinking (Han, 2013).

The two main criteria in scientific reasoning are domain-specific conceptual knowledge and domain-general reasoning and problem solving strategies (Zimmerman, 2000). What children learn in school is known as domain specific knowledge which is the science content of the lesson. Whereas domain general reasoning is about the cognitive development which leads to scientific thinking (Dunbar & Klahr, 2012). The combination of these two criteria is

known as scientific reasoning. The scientific reasoning skill is utilized in everyday life to deal with real problems. It is a proven fact students' achievement is increasing with the mastery of scientific reasoning skill (Adey & Shayer, 1994).

There are several skill dimensions in scientific reasoning skill. The dimensions are as follows:-

- Control of variables
- Proportions and ratios
- Probability
- Correlational reasoning
- Basic logical reasoning
- Inductive reasoning
- Causal reasoning
- Hypothetical-deductive reasoning

#### **4.0 Relation Between Scientific Reasoning Skill and STEM Achievement**

Achievement is a way to measure student learning outcomes if the teaching method achieved its objective (Smnuek, 2014). Learning achievement usually measured by examination scores. In STEM, learning achievement is measured by students' projects, their feedback and their examination scores (Hwang, 2010). It is a proven fact that scientific reasoning has a positive impact on students' achievements (Ayan, 2012). Fostering scientific reasoning skill definitely increases STEM achievement.

Students with a high level of reasoning skill is able to deduce the hidden facts beyond the challenges assign to them. Hence, they able to perform the challenges and find solutions effectively. Learning can be difficult if inadequate of scientific reasoning skill because they will face difficulty to transfer the knowledge in formal writing (Wong, 2013). Reasoning skill permit students to express their thoughts in writing a proof (Blanton, 2014). This is an achievement of STEM learning. With the learning experiences and scientific reasoning skill, students are more involved in STEM major. Good scientific reasoning skill can improve students' achievement.

#### **5.0 The role of scientific reasoning skill in STEM learning**

Scientific reasoning act as role of retention in STEM learning (Jensen, 2015). Based on past research it is shown that students majoring in STEM will develop high scientific reasoning skill. Scientific reasoning skill becomes a key element to teach STEM components. The approaches used in STEM learning will enhance students' inquiry learning. One of the main scientific reasoning skill seen across the STEM learning is hypothetical-deductive (Bao, 2009). Without this skill, students will find it difficult to find solutions in STEM learning. Mastering scientific reasoning skill is a must to face the rigorous challenges in STEM learning.

Besides, scientific reasoning skill in STEM learning gives authentic learning experience to students (Rockland, 2010). The inquiry based learning method which utilizes scientific reasoning skill enables students to perform investigations and complete the tasks. Students discover new knowledge by themselves and also discover solutions by themselves with minimal guidance of teachers. Students able to transfer their prior knowledge in performing a task.

Students learning process can be affected if there is lack of reasoning skill. Thus, it is undeniable the role of scientific reasoning is crucial in STEM learning.

## 6.0 Assessment of Scientific Reasoning Skill

Assessment is a way to find out if students are learning what has been taught. It is essential to have an assessment tool to measure students scientific reasoning skill. The Piagetian clinical interview was the traditional assessment of scientific reasoning skill. The traditional method special materials, experienced interviewers and consume a lot of time (Inhelder, 1958). Moving forward, several researchers build instrument using the Piagetian method as a basis.

Some of the assessments available are the Group of Logical Thinking Test (GALT), Test of Logical Thinking (TOLT) and the Lawson's Classroom Test of Scientific Reasoning (Han, 2013). TOLT is built in 1981 by Tobin and Cabie. The test contains 10 items of multiple choice question. The test requires students to understand to identify variables to answer the question. In 1982, Roadrangka Yanny developed GALT which is a 21 item paper pencil test. The test built as such students give answers and justify their answer. Lawson develops scientific reasoning test in 1978. Later he update the version in the year 2000. It contains 24 multiple choice questions. It is a two-tier questions. Students need to justify the answers they choose.

## 7.0 Conclusion

It is important for the Malaysian education system to foster students scientific reasoning skill to prepare them for the international assessment. A standardize assessment to measure students scientific reasoning is crucial to analyze the level of students and make proper efforts to improve it. Assessing students scientific reasoning skills will help authority to construct suitable curriculum to develop their scientific reasoning skill. Thus, Malaysian students able to compete with students of another country in the international arena. A misfortune can occur if Malaysian Education fails to produce quality learners (Wun, 2015). It is important to develop scientific reasoning skill among students. It is also important to measure if students have acquired the scientific reasoning skill. Assessment is the bridge between teaching and learning (Bramwell et al., 2014). Thus, an accurate instrument is needed to measure Malaysian students scientific reasoning skill. With the proper assessment we able to analyze students strength and weakness. STEM learning approaches can be improved with the mastery of scientific reasoning skill.

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## **Kepimpinan Instruksional Pengetua Sekolah Amanah Negeri Johor**

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### **Abstrak:**

Kajian ini bertujuan untuk mengenal pasti amalan kepemimpinan instruksional Pengetua Sekolah Amanah Negeri Johor. Kajian juga akan mengenal pasti cabaran yang dihadapi dan strategi yang digunakan oleh pengetua Sekolah Amanah terpilih dalam amalan kepemimpinan instruksional. Kajian ini menggunakan kaedah gabungan kuantitatif dan kualitatif dengan reka bentuk penjelasan (*explanatory design*). Seramai 226 orang guru dari Sekolah Amanah di negeri Johor akan dipilih sebagai sampel kajian. Peserta kajian bagi kualitatif adalah terdiri daripada tiga orang pengetua dari tiga Sekolah Amanah yang terpilih di Johor. Selain daripada pengetua, seorang Guru Penolong Kanan dan seorang Pemimpin Pertengahan turut dipilih dari setiap Sekolah Amanah tersebut sebagai informan kepada kajian. Pengumpulan data dilaksanakan melalui soal selidik, temu bual, pemerhatian dan analisis dokumen. Data kuantitatif akan dianalisis menggunakan perisian SPSS 22, manakala bagi data kualitatif pula akan dianalisis melalui beberapa peringkat iaitu reduksi data secara tematik, pengekodan, mengkategorikan, analisis silang-kes dan interpretasi dengan menggunakan perisian NVivo 11. Jangkaan dapatan kajian akan menunjukkan amalan kepemimpinan instruksional dalam kalangan pengetua Sekolah Amanah dan satu rangka kerja Kepimpinan Instruksional Sekolah Amanah akan dihasilkan daripada kajian ini dan diharapkan ia boleh dijadikan sebagai panduan kepada pemimpin sekolah yang bercita-cita untuk menjadikan sekolah mereka terus cemerlang.

**Kata kunci:** Kepimpinan Instruksional, Sekolah Amanah, amalan, cabaran, strategi

### **1.0 Pengenalan**

Kepimpinan Instruksional merujuk kepada kepemimpinan seorang pemimpin sesebuah organisasi pendidikan yang menumpukan kepada peningkatan kualiti pengajaran dan pembelajaran. Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 menuntut kepimpinan sekolah untuk memainkan peranan sebagai pemimpin instruksional yang berkesan. Anjakan 5 dalam PPPM menyatakan keperluan kepimpinan berprestasi tinggi ditempatkan di setiap sekolah bagi meningkatkan prestasi sekolah. Namun begitu, banyak kajian mendapati pemimpin sekolah tidak kompeten dan tahap amalan kepimpinan instruksional mereka tidak memuaskan. Walau bagaimanapun, terdapat pengetua Sekolah Amanah yang telah mempraktikkan amalan kepimpinan cemerlang hingga membawa kepada lonjakan kualiti pengajaran guru dan peningkatan pencapaian pelajar secara holistik. Oleh itu, ciri-ciri dan amalan mereka perlu dikaji dan dijadikan panduan kepada pemimpin sekolah yang lain.



Kajian ini akan dijalankan berdasarkan Kerangka Kepimpinan Instruksional dengan menggunakan Model Hallinger dan Murphy (1985). Hallinger dan Murphy (1985) telah membangunkan satu kerangka kepimpinan instruksional yang terdiri daripada tiga dimensi iaitu, mendefinisi misi sekolah, mengurus program instruksional, dan membentuk iklim sekolah yang positif. Hallinger dan Murphy (1985) telah menyenaraikan sebelas tugas utama pemimpin instruksional iaitu merangka matlamat sekolah dengan jelas, menyampaikan matlamat sekolah dengan jelas, mencerap dan menilai pengajaran, menyelaras kurikulum, memantau kemajuan murid, melindungi masa pengajaran, mempromosi pembangunan profesional, mengekalkan keterlihatan yang tinggi, memberi insentif kepada guru, merangka dan menguatkuasakan standard akademik dan mewujudkan insentif untuk pembelajaran

Banyak kajian mendapati tahap amalan kepimpinan instruksional dalam kalangan pengetua adalah kurang memuaskan (Hallinger dan Lee, 2014; Talip, 2016) dan rendah (Quah, 2011; Packard, 2011; Yaser dan Amal, 2015). Malahan, menurut Mohd Yusri dan Aziz (2014), pengetua tidak dapat mengamalkan fungsi kepimpinan instruksional. Pengetua dibebani dengan tugas-tugas pentadbiran (Hallinger, 2011; Jameela dan Jainabee, 2012; Arsaythamby *et al.*, 2013; Azlin dan Roselan, 2015). Situasi ini bertambah buruk apabila pemimpin instruksional dikenalpasti kurang pengetahuan tentang kurikulum semasa (Weber, 1996; James dan Balasandran, 2012; KPM, 2013). Kesan daripada masalah ini membawa kepada kegagalan pemimpin instruksional untuk melaksanakan penyeliaan pengajaran dengan berkesan (Mohd Yusri dan Aziz, 2014; KPM, 2014). Kelemahan pengetua menjalankan tugas sebagai pemimpin instruksional memberi kesan secara langsung kepada pengajaran guru dan pembelajaran murid. Isu yang berlaku ini mendorong pengkaji untuk melihat amalan kepimpinan instruksional pengetua di Sekolah Amanah yang berfokuskan kepada pengajaran dan pembelajaran.

Antara faktor utama keberkesanan sekolah adalah pemimpin instruksional yang terlibat dengan pengajaran (Hallinger dan Murphy, 1985; Hallinger, 2011; James dan Balasandran, 2013; Mat Rahimi dan Mohd Yusri, 2015; Hussien, 2016). Kajian yang dibuat oleh Ritthirong dan Thanomwan (2013) di Thailand mendapati terdapat hubungan antara kepimpinan instruksional dengan keberkesanan sekolah. Kenyataan ini disokong oleh Aniza dan Zaidatol (2013) dalam kajiannya di Pahang mendapati kepimpinan instruksional mempengaruhi keberkesanan sekolah. Tugas pemimpin instruksional adalah mendefinisi misi sekolah dengan merangka matlamat sekolah dan menyampaikan matlamat tersebut kepada warga sekolah (Hallinger dan Murphy, 1985). Namun, isu yang seringkali timbul adalah warga sekolah tidak berkongsi misi yang diterapkan oleh pemimpin sekolah dengan tidak melaksanakan misi tersebut (James dan Balasandran, 2013). Walaupun demikian, terdapat kajian yang menunjukkan dimensi mentakrif dan menjelaskan matlamat sekolah adalah dimensi tertinggi yang menjadi amalan kepimpinan instruksional (Talip, 2010; Mendels, 2012; Hallinger dan Lee, 2014; Syafinaz, 2017; Yen dan Abdullah, 2017).

Kepimpinan instruksional berkait rapat dengan mengurus program instruksional terutamanya penyeliaan pengajaran (Hallinger dan Murphy, 1985). Kajian yang dibuat oleh Blase dan Blase (2000) untuk melihat bagaimana pengetua mempromosi pengajaran dan pembelajaran di sekolah menurut pandangan guru mendapati dua dimensi pemimpin instruksional yang efektif adalah berbincang dengan guru untuk refleksi pengajaran dan menggalakkan perkembangan profesional. Kenyataan ini disokong dengan kajian oleh Mohd Yusri dan Aziz (2014) di Terengganu mendapati kepemimpinan instruksional mempunyai hubungan positif dan menyumbang secara signifikan terhadap pengajaran guru. Pemimpin sekolah yang memberi perhatian kepada perkembangan profesional guru dapat

mempengaruhi ke arah peningkatan kualiti pengajaran (Mariani *et al.*, 2016). Kajian yang dibuat oleh Rahmad *et al.* (2016) di Kuala Pilah, Negeri Sembilan menunjukkan bahawa penganjuran perkembangan profesional merupakan faktor yang paling mempengaruhi pedagogi kreatif guru-guru. Menurut Mohd Ibrahim *et al.* (2015), penyeliaan adalah salah satu tugas utama pemimpin instruksional untuk meningkatkan pencapaian sekolah. Namun begitu, Quah (2011) dalam kajiannya mendapati pengetua kurang memberi perhatian dalam memantau proses pengajaran dan pembelajaran. Kajian oleh Lokman *et al.* (2013) juga mendapati pengetua kurang memberi sokongan dalam aktiviti pengajaran dan pembelajaran. Oleh yang demikian, para pengkaji mendapati fungsi kepimpinan instruksional yang paling rendah diamalkan adalah fungsi mencerap dan menilai pengajaran guru.

Menurut Hallinger dan Murphy (1985), pengetua selaku pemimpin instruksional mempunyai tugas untuk memantau pencapaian murid. Kajian yang dibuat oleh Quah (2011) terhadap 220 orang guru di Johor mendapati pengetua telah memainkan dua peranan dengan cemerlang iaitu mengenalpasti murid yang cemerlang dalam akademik dengan diberi insentif dan menggunakan masa perhimpunan untuk memotivasikan murid dalam pembelajaran mereka. Namun pengetua kurang untuk bertemu dengan murid yang menghadapi masalah dalam pelajaran. Beliau juga mendapati amalan kepimpinan instruksional pengetua sekolah kajiannya mempunyai hubungan yang signifikan dengan pencapaian akademik pelajar. Kajian yang dibuat oleh Mohd Yusri dan Aziz (2014) juga menunjukkan bahawa kepimpinan pengetua memberi sumbangan kepada pencapaian murid. Namun dapatan ini bercanggah dengan kajian yang dibuat oleh Premavathy (2010) terhadap 14 buah sekolah kurang murid di negeri Pulau Pinang mendapati hubungan tidak signifikan antara dimensi kepimpinan instruksional dengan pencapaian akademik murid. Dapatan ini disokong pula oleh kajian yang dibuat oleh Zakaria (2016) yang mendapati hubungan yang lemah antara kepimpinan instruksional dengan pencapaian murid.

Dimensi ketiga dalam kepimpinan instruksional adalah membentuk iklim sekolah yang positif. Iklim merujuk kepada nilai dan sikap kakitangan dan pelajar yang boleh mempengaruhi pembelajaran di sekolah (Hallinger dan Murphy, 1985). Kajian yang dibuat oleh Mariani *et al.* (2016) terhadap enam orang guru besar sekolah rendah berprestasi tinggi di Wilayah Persekutuan Kuala Lumpur dengan menggunakan pendekatan kualitatif mendapati mereka mengamalkan lima dimensi membentuk iklim sekolah yang positif dalam kepimpinan instruksional. Shazwaatirah (2014) dalam kajiannya di Kuala Lumpur mendapati terdapat hubungan yang sederhana antara tingkah laku kepimpinan instruksional pengetua dan iklim sekolah. Shazwaatirah (2014) juga mencadangkan agar pengetua lelaki lebih melibatkan diri dengan amalan kepimpinan instruksional agar iklim sekolah menjadi lebih baik. Walau bagaimanapun, kajian yang dibuat oleh Zakaria (2016) mendapati amalan kepimpinan instruksional yang diamalkan oleh guru besar Sekolah Kurang Murid (SKM) dengan dimensi membentuk iklim sekolah lebih menonjol diamalkan oleh mereka.

Oleh kerana pelaksanaan Sekolah Amanah di Malaysia baru sahaja memasuki tahun ketujuh, maka kajian tentangnya masih kurang dan hanya menyentuh tentang pelaksanaan kurikulum dan pengurusan pentadbiran. Kajian oleh Ravi *et al.* (2016) yang menggunakan pendekatan kualitatif terhadap empat orang informan yang terdiri daripada Guru Besar, Penolong Kanan dan dua orang guru mendapati bahawa telah pelaksanaan kurikulum di Sekolah Amanah di Sekolah Kebangsaan Sultan Hisamuddin Alam Shah Kuala Lumpur telah meningkatkan prestasi pelajar secara menyeluruh dan mencapai matlamat strategik Program Sekolah Amanah. Kejayaan ini adalah hasil kerjasama yang padu antara sekolah, murid, ibu bapa dan komuniti. Namun kajian oleh Muhammad Afiq dan Mohd Izham (2017) terhadap

16 orang pentadbir dan 143 orang guru melibatkan 7 buah sekolah rendah berstatus Sekolah Amanah di Sarawak mendapati tahap prestasi guru di bawah amalan pentadbiran Sekolah Amanah menunjukkan nilai min pada tahap yang sederhana. Dapatan kajian yang menggunakan Teori Laluan Matlamat sebagai kerangka kajian juga menunjukkan bahawa nilai min perspektif pentadbir terhadap amalan pentadbiran mereka di Sekolah Amanah adalah pada tahap yang sederhana.

Konsep Sekolah Amanah di luar negara melibatkan sektor swasta dalam pendidikan cuma menggunakan nama yang berbeza. Rabea *et al.* (2015) dalam kajiannya tentang perkongsian pengurusan dalam pendidikan di Punjab dan Sindh mendapati hasil pembelajaran di Sekolah Angkat (*Adopted School*) bertambah baik dan para guru melaksanakan amalan terbaik dalam pedagogi dalam kelas. Namun dapatan kajian Hoxby dan Rockoff (2004) mendapati Sekolah Piagam (*Charter School*) dapat memberi pendidikan berkualiti tinggi tetapi terdapat kejatuhan pencapaian murid di sekolah tersebut.

## 2.0 Metodologi Kajian

Kajian ini dijalankan secara pendekatan gabungan kaedah kualitatif dan kuantitatif dengan reka bentuk penjelasan (*explanatory design*). Kaedah ini perlu dibuat secara berperingkat melalui dua fasa yang berbeza iaitu kaedah kuantitatif dijalankan dalam fasa pertama dan disusuli dengan kaedah kualitatif pada fasa kedua. Seterusnya, laporan penyelidikan dibuat berdasarkan daripada dapatan kuantitatif diikuti dengan dapatan kualitatif. Dalam kajian yang menggunakan pendekatan gabungan ini, terdapat dua jenis persampelan. Pertama, bagi kajian kuantitatif, persampelan rawak mudah digunakan. Kedua, bagi kajian kualitatif, pengkaji menggunakan kaedah persampelan secara bertujuan (*purposive*) homogen. Untuk menjawab persoalan pertama yang menggunakan pendekatan kuantitatif, pengkaji akan menggunakan soal selidik yang diadaptasi oleh pengkaji daripada kajian Syafinaz (2016) dan diubahsuai mengikut keperluan kajian. Untuk menjawab persoalan kedua dan ketiga yang menggunakan pendekatan kualitatif, maka instrumen yang digunakan dalam kajian melibatkan pengumpulan data secara triangulasi iaitu temu bual, pemerhatian dan analisis dokumen yang berkaitan. Protokol temu bual diadaptasi daripada kajian Zakaria (2016). Bagi menganalisis data kuantitatif, pengkaji akan menggunakan perisian SPSS 22 untuk mendapatkan nilai statistik deskriptif. Manakala bagi menganalisis data kualitatif, pengkaji akan menggunakan perisian NVivo 11.

## 3.0 Jangkaan Dapatan

Kajian akan mendapati tahap amalan kepimpinan instruksional dalam kalangan Pengetua Sekolah Amanah Negeri Johor adalah tinggi. Kajian akan dapat mengenal pasti cabaran yang dihadapi oleh Pengetua Sekolah Amanah dalam amalan kepimpinan instruksional. Kajian juga akan dapat mengenal pasti strategi yang digunakan oleh Pengetua Sekolah Amanah dalam melaksanakan dimensi-dimensi Kepimpinan Instruksional iaitu mendefinisi misi sekolah, mengurus program instruksional dan membentuk iklim sekolah yang positif. Setiap dimensi mempunyai tugas pemimpin yang tersendiri iaitu merangka matlamat sekolah dengan jelas, menyampaikan matlamat sekolah dengan jelas, mencerap dan menilai pengajaran, menyelaras kurikulum, memantau kemajuan murid, melindungi masa pengajaran, mempromosi pembangunan profesional, mengekalkan keterlihatan yang tinggi, memberi insentif kepada guru, merangka dan menguatkuasakan standard akademik dan mewujudkan insentif untuk pembelajaran. Akhirnya, satu Rangka kerja Kepimpinan

Instruksional Pengetua Sekolah Amanah Negeri Johor yang merangkumi amalan terbaik akan dapat dihasilkan.

#### 4.0 Metodologi Kajian

Kepimpinan Instruksional adalah satu gaya kepimpinan yang dikenal pasti berdasarkan kajian-kajian lepas dapat merealisasikan hasrat Kementerian Pendidikan Malaysia (KPM) dalam Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025. Pengetua Sekolah Amanah boleh dijadikan contoh dalam amalan Kepimpinan Instruksional. Kepimpinan Instruksional yang diamalkan di Sekolah Amanah dapat meningkatkan kualiti pengajaran dan pembelajaran di kelas seterusnya dapat membentuk modal insan yang holistik. Hasil dapatan kajian ini dan rangka kerja yang akan dihasilkan boleh digunakan sebagai panduan kepada kepimpinan sekolah dalam amalan Kepimpinan Instruksional.

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# Empowering Community through Agripreneurship Training in Organic Catfish Processing

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## Abstract:

The aims of this research are to describe the effectiveness of training in organic agripreneurship catfish processing to the breeder. This study was conducted at Gowa regency with the farmer all at once as a breeder of catfish and training as subject as many as 25 people. Four steps arrange the training method consists of Necessary identification, panning of training models, implementation and evaluation. Analysis of effectivity conducted by Comparing the knowledge value and breeder skills before and after training. Non-parametric statistics used as the methodology by using a Wilcoxon test. The results of training effectivity show that awareness and expertise of the people are increased after the training. Also, Influence analysis indicates that the training method had given a significant influence toward the competence and knowledge of the society.

**Keywords:** training, empowering, community

## 1.0 Introduction

In global food security, fisheries have been playing important roles. Food fish provides world population with an average on one fifth on total animal protein intake (Youn *et al.* 2014). One of the favorite trade food in the world is fish, about 50% coming from developing countries. Wild and farmed fish are the sourced of trading foods (Claret *et al.* 2014). Catfish is the one fishery commodity that its development increased rapidly and highly prospective in supporting food security program. It species globally produced over 1 million tons per year. Vietnam, Indonesia, Malaysia, Cambodia, Bangladesh, China, and Laos are the major producer of catfish in the world and growing both for local consumption and export (Thong *et al.* 2016).

As one source of animal protein, organic catfish farming has been on the additional job of rural communities. Its cultivation is cheap and easy due to developed catfish can be maintained with limited land and watering. Organic catfish farming relies on microorganisms that serve to decompose the feces and ammonia which saved and kept in the pond to keep it healthy. Organic catfish farming is relatively short between 45 to 60 days and the yields of the harvest become a primary reason (Gross *et al.* 2000).

Utilization of natural catfish by the social community can be developed with an entrepreneurship program. Agripreneurship is a branch of the enterprise that its superior product is agricultural production. Four aspects of agripreneurship are innovation, manufacturing, financial and markets. The outcome that can be obtaine with agripreneurship is socio-economic benefits, income, and sustainability (Vyavahare & Bendal 2012; Tripathi & Agarwal n.d.; Ukpata & Onyeukwu 2014).

By the concept of agripreneurship, the society that relies on the agriculture product can develop their financial capabilities. This empowerment requires an agricultural product innovation, support of markets network and government policy. Hence, it is necessary to measure community empowerment through training. Training is a learning process which is emphasized in practice rather than theory to improve the knowledge and specific skills. Moreover, achieving the desired objectives, the training designed according to the characteristics of group targets. It considered into the five principles in the implementation of the training are: everyone is a learner, people learn from each other, learning enables change, learning is continuous and learning in investment, not an expense (Goad 1997).

Training program refers to the adults learning model; then the learning motivation supported internally by the desired to increase the work satisfaction, self-esteem, and improved quality of life. Further, adult-leaning characteristics are the autonomy of adults is quite high, accumulated of experiences and knowledge, goal orientation, the relevant of orientation to the something relevant to their needs, as well as requiring attention and appreciation (Galusha 1998).

## 2.0 Research Method

This study was conducted on May-June 2016 in Gowa, south of Sulawesi. The training objects are 25 of organic catfish farmers. The research variables are knowledge and skills that tested by the pre-test and posttest method. Data analysis is used to non-parametric statistical techniques Wilcoxon test to see the differences of knowledge and expertise people before and after training.

Target training is a housewife in Gowa which aims to increase knowledge and skills in the processing of organic catfish. The processed product that introduced to the public is fish nuggets. It is one of the products prepared from finely ground fish meat and flavored with spices, printed and then smeared with egg and fried. These products can last up to a month with a storage temperature lower than 20 0 C. However, people's knowledge toward the various of processed catfish still small (Gross *et al.* 2000).

## 3.0 Result and Discussion

The most of the subject in this research are a woman with the last education is senior high school. The range of age of the participants are between 25-50 years and dominated by 40-50 years. Participants should have a similar social and economic characteristics as shown in Table 1.

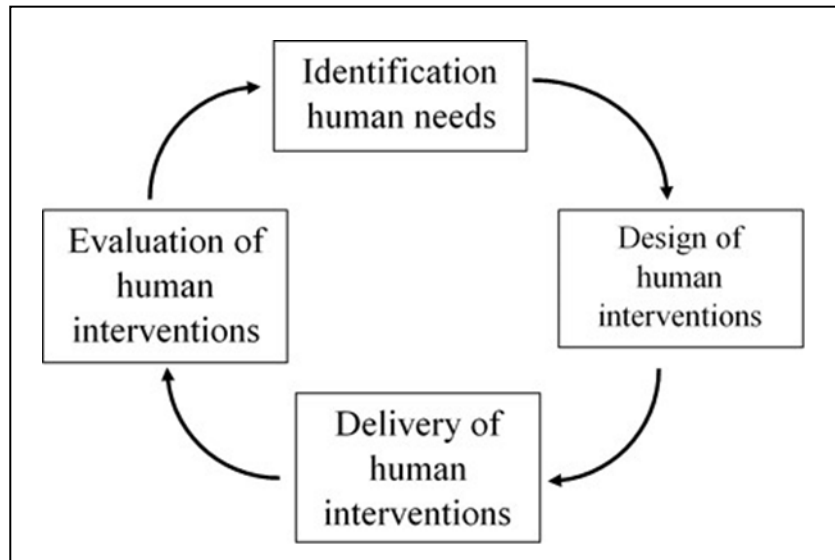
**Table 1:** Characteristics of subjects training

Characteristics of Respondents	Percentage (%)
<b>Gender</b>	
Women (65%)	76
Male - Male (35%)	24
<b>Last education</b>	
Secondary school	64
University	26



Age	
25-30 years	8
30-40 years	24
40-50 years	68

Training model that built in community empowerment activities for utilization of organic catfish based on the phases introduced by Mankin shows in Figure 1;



**Figure 1:** Steps of development training

The first step is to identify the necessary of community that produces a description which knowledge and skills needed in the processing of organic catfish. The people's desire to develop knowledge and expertise are also very high, even the number of applicants exceeds the capacity of trainers and a study room. The second step is the preparation of a training model which formulate the learning objectives, a participatory approach, supporting systems such as media training, time, and evaluation instruments. The third step is training implementation during the first meetings to discuss the quality of organic catfish, processing, quality of the nugget and packaging system. At the second meeting, the practice of making fish nuggets begins with the supply of material.

The materials are organic catfish, tapioca, flour, cornstarch, flour, and salt. The fourth stage is to evaluate the learning outcomes consist of knowledge test and participant skills evaluation. The training effectiveness is measured based on the data of knowledge and expertise of people before and after training. Overview of the results of non-parametric statistical tests for learning variables is presented in Table 2 and Table 3.

**Table 2:** Public awareness of the use of organic catfish before and after training

	N	Mean	Std. deviation	Minimum	Maximum
KnowPre	25	65.71	7.57	50.00	82.14
KnowPost	25	88.57	8.56	67.86	100.00

Table 2 shows that the value of the training given is between 50.00 to 82.14. Having given the knowledge training values increase by the range 67.86 to 100.00. The average value also increased from 65.71 to 88.57. Standard deviation or diversity of knowledge societies are relatively the same before and after training. Table 3 shows that the well-training results of the participants and they were showed an increase of knowledge.

**Table 3:** Increasing the knowledge society

		N	Mean Rank	Sum of Ranks
KnowPost - KnowPre	Neg. Ranks	0 <sup>a</sup>	,00	,00
	Pos. Ranks	25 <sup>b</sup>	13.00	325.00
	Ties	0 <sup>c</sup>		
	Total	25		
	Z	-		
	Asymp. Sig.(2-tailed)	4.379 <sup>b</sup>		
			,000	

Analysis results with the Wilcoxon test  $n = 25$ , 5% error level 5% indicates the value of Asymp. Sig. 0,000 (Asymp. Sig.  $< 0.05$ ). Z count value at the Wilcoxon test 4,378 an absolute value and comparing with Z table = 1.64, so the Z count is greater than Z tables. The result shows that the training undertook significant effect in improving the knowledge of trainees.

Results of non-parametric statistical tests for community skills by training approach as following in Table 4 and Table 5.

**Table 4:** Skills community about organic catfish utilization before and after training

	N	Mean	Std. dev	Minimum	Maximum
SkillPre	25	37.6156	2.72230	32.69	44.23
SkillPost	25	81.4632	2.71358	76.92	86.54

**Table 5:** Increased knowledge of society

		N	Mean Rank	Sum of Ranks
SkillPost- SkillPre	negative Ranks	0 <sup>a</sup>	,00	,00
	positive Ranks	25 <sup>b</sup>	13.00	325.00
	Ties	0 <sup>c</sup>		
	Total	25		
	Z	-4376		
	Asymp.Sig. (2-tailed)	.000		

Table 4 shows that skills before the training about 32.69 to 44.23. Having given training this value increases with a range of 76.92 to 85.54. The average value also increased from 37.61 to 81.46. The standard deviation of knowledge societies is relatively same before and after training. Table 5 shows well-results toward the improvement of company skills that proved with all subjects showed an increase in skills training.

Development of knowledge supported by training support system that designed previously. Support system includes the training room that is laid out according to the needs of adults. Similarly with training media and practice support tools. Wilcoxon test analysis by comparing knowledge of trainees through pretest and posttest showed significantly enhance knowledge and skills of the participants.

The research proves that the model of participatory has increased knowledge and expertise in the processing of organic catfish. The model is consistent with Wannasai & Shrestha (2007) said that the training could improve human capabilities. Knowledge about technologies will increase the farmer skill and practice in land well-management.

Furthermore, awareness of the community in the development of processed fish products also hoped will increase the economic capacity of farmers. Catfish prepared product development aimed at utilizing the large fish. Also, it also seeks to anticipate market saturation.

#### 4.0 Conclusion

The result of training effectivity test demonstrates that there is an increased of knowledge and skills of the community after the training. Influence analysis also shows the influence of significant training toward enhancement of knowledge and expertise of the communities.

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## **Educational Issues In Fak Fak, West Papua Province**

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### **Abstract:**

Papua Province is one of the provinces with low welfare levels compared to other regions. This condition affects the educational activities of the community. Fakfak as one of the administrative areas also experienced various obstacles in the field of education. The main problem is the availability of very low quality human resources. As a result, there are many population with low literacy and low school enrollment rates

**Keywords:** human resources, literacy and educational program

### **1.0 Introduction**

In the development of the world, today is in the era of globalization many changes occur both in urban communities and in village communities. These changes have an impact on all aspects which one is education. Papua is an island located at the eastern end of the territory of Indonesia. The island of Papua administratively consists of two, Papua and West Papua Provinces. However, the island is not only filled by the State of the Republic of Indonesia, but also other countries become one island with Papua, Papua New Guinea or East New Guinea located in the east of Papua Indonesia. Papua province used to cover the entire western part of Papua, but since 2003 it has been divided into two provinces where the eastern part still retains the name of Papua while the western part uses the name of West Papua.

One of the regencies in West Papua province is Fakfak Regency. Astronomically Fakfak Regency is located between 1310 53'03 " - 1330 29'19" East Longitude and 20 30'58 " - 30 57'51" LS with an area of 14,320 km<sup>2</sup>. Regency of Kaimana is adjacent to Regency of Kaimana in the west, Seram and Teluk Berau in the west, Regency of Bintuni Bay in the north and Arafuru Sea and Kaimana Regency in the south. Regency of Fakfak consists of 17 districts ) and nine villages and 142 villages. The population of Fakfak Regency based on the projected population in 2017 grew by 1.77 percent. Density is only five souls / km<sup>2</sup> with the average number of people per household four people.

Education problems in Indonesia are related to quality. The focus of education management development refers to the principle of autonomy, accountability, accreditation, and evaluation. The four pillars of management is a reference to improve the quality of education. Autonomy implies that in the management of education there is a form of division of authority as in the management of learners and faculty, curriculum development, teaching materials, and academic standards. Accountability implies that the organization of education is required to produce output and outcomes by the expectations of the community. These goals also include norms, ethics, and values to be achieved with the learning program. Accreditation as an external control system through the evaluation process of quality improvement of educational institutions While evaluation is a systematic effort to collect and

process information that results in conclusions about value, benefits, and performance of educational institutions. (Wardhani, 2017) This article describes the various issues of education in Fakfak District along with various programs to improve the quality of education as a solution to the issue.

## 2.0 Research Method

This review uses documentation method and interviews on behalf of local government. Informant research as much as six people that is three people from Education Office of West Papua Province and three people from District Fakfak.

## 3.0 Result and Discuss

### 3.1 Facts about educational issues

Interviews with informants resulted in five educational problems in Fakfak district presented in Table 1

**Table 1:** Resume on Educational Issues

<b>Problems</b>	<b>Cause</b>	<b>Effect</b>
Lack of Elementary School Teachers in Remote Areas	- Remote, isolated area. - There are still many elementary schools in remote and isolated areas where there are no headmasters and teachers' homes, so many headmasters and teachers leave the duty	The learning process is not effective
There are still 30% of the population aged 15-59 in Fakfak who do not know reading	Low learning interest Lack of teachers	Information access is low and has an impact on the degree of economy
School participation rate of elementary and junior high school students is low	School buildings and supporting infrastructure are minimal	
The quality of teaching staff is minimal,	There are still many teachers who are not certified and do not have status as civil servants	The learning process is not effective.

Factors influencing the development of education problems in Papua, especially in Fakfak Regency are:

### *Development of Science and technology*

Fakfak Regency with limited information means causing limited access to science and technology. The limited educational system has an impact on the lack of innovation or renewal of school management and learning models.

### *Development of Art*

Art is a creative activity of humans, individually or in groups that produce something beautiful. Through human art can channel the urge to create (create) that is original (not imitation) and spontaneity encouragement in finding the beauty. The development of art in

Fakfak Regency is prolonged. This fact is evidenced by the lack of modern art performance events

### ***Citizen deployment***

The population distribution in Fakfak Regency is uneven. There are densely populated areas, but some rare inhabitants are inland areas especially in remote areas located in the mountains and on the islands. Such a picture of the population distribution is causing difficulties in providing educational facilities. The Effort of education problem in Fakfak District through the Special Autonomy policy the government prioritizes the management of special autonomy funds for the education sector to get a portion of 30% of the total to encourage the acceleration of educational development to pursue the backwardness of the education sector felt so far in Papua.

- 1) Provision of education infrastructure.
- 2) Scholarships for Papuan sons and daughters for schools/credits at schools or colleges at home and abroad.
- 3) Increased teacher competence. In addition to these activities, the central government and provincial governments held various programs, namely:

### **3.2 Educational Affirmation Program**

Educational Affirmation Program initiated with the Ministry of Education and Culture and Universities / Schools / Institutions in the form of Higher Education Affirmation (ADIK), Secondary Education Affirmation (ADEM), and Vocational Affirmation which includes education in STAN, STIS, STPI, AKMIL, and AKPOL.

#### ***Higher Education Affirmation Program (ADIK)***

This Higher Education Affirmation Program (ADIK) provides an opportunity for Papuan sons and daughters of high school graduates to continue to State Universities outside Papua. This program started in 2012 by sending 770 students graduating from SMA / SMK to 32 PTN. Through coordination, synchronization and facilitation of the Directorate General of Higher Education and the Rector of University and the Provincial Government of Papua, West Papua and Regency / City. The parties agreed to provide quota and scholarships for OAP reaching 600 students for higher education in 39 state universities outside Papua and West Papua. After going through the selection stages until the graduation announcement, the prospective students of ADIK have been dispatched to 39 state universities in 29 cities spread from Banda Aceh to Maluku. In 2015 ADIK program has entered the fourth year. At the beginning of the ADIK program, there were many difficulties in persuading Papuan children to attend the program to continue to higher education, but in the fourth year, ADIK participants are increasing.

#### ***Secondary Education Affirmation Program (ADEM)***

The ADEM program is a national program to accelerate Papua's development through affirmative action for Papuan and West Papuan Youths to continue their education in some areas in Java and Bali. The ADEM program aims to develop Human Resources in the Provinces of Papua and West Papua in shaping the nation's character and printing the nation's cadre for Papuan sons and daughters who can build Papua and West Papua more advanced.

The ADEM program is rolling since 2013 and entering its third year (2015). A total of 1,304 Papuan children have studied at high school or vocational level in Yogyakarta, East Java, West Java, Central Java, Banten, and Bali. For the ADEM program, 505 Papuan children are enrolled in Senior High School and Vocational High School in Six Provinces.

### ***Vocational Affirmation Program***

The Development Acceleration Unit of Papua and West Papua Provinces (UP4B) has initiated several affirmations of vocational education to produce OAP experts in various fields with specific specializations. The vocational education graduates are equipped with knowledge and skills and professional expertise according to their respective fields. Some of the vocational education that has been implemented is at the State High School of Accountancy (STAN), Indonesian High School (STPI), College of Statistics (STIS), the TNI Academy, and the Police Academy (AKPOL).

### **3.3 Government Partnership for Development Program**

Since 2007, The University of Sunshine Coast (USC) and the Provincial Government of Papua, have implemented various activities to improve the quality of education in Papua. The first activity begins with the signing of the MoU by the three leaders of the above institutions, followed by sending high school teachers from several schools in Papua to attend training for approximately 2-3 months at the USC Campus in Sunshine Coast, Queensland, Australia. The partnership has sent more than 150 Papuan teachers and principals to practice on the USC campus, involving approximately 12 government schools and private schools scattered across the state of Queensland, Australia.

### **3.4 Educational Undergraduate Programs in Outlying, Left, and Underdeveloped Areas (SM-3T)**

The SM-3T program is a program of educational graduate dedication to participate in the acceleration of educational development in the 3T area for one year as a professional educator preparation that will be followed up with the Teacher Professional Education Program. The SM-3T program is one of Papua and West Papua's development programs which consists of three critical things. This program is addressing the needs of teachers in the short term for one year, teacher education in Indonesia, and educating the sons and daughters of Papua to various state universities that accept to build Papua and west Papua if already graduated.

## **4.0 Discussion**

Analyzing the problem described above, it takes various approaches to find a solution. Improving the quality of education can be done with three perspectives: an economic perspective, sociology, and education. The economic perspective means that educational activities must contribute highly to economic growth. In the context of quality, schooling is seen as the ability of schools to respond and meet the needs of pupils and the community. Meanwhile, according to educational perspective, education activities should include improvements in the teaching and learning process and terms of the ability of graduates. Quality of education viewed from the product side that is if the graduate can complete the study with the level of mastery of science and technology is good. Also, the community

gained satisfaction with the results of education because there is a match between the mastery of science and technology with the necessities of life. (Herawan, 2017)

Furthermore, the issue of education can also be analyzed by a sociological approach that is the social choice of Fakfak community about the direction of regional development as well as taking into consideration local customs and norms. Such choices will naturally impact on the achievement of local welfare improvements. (Sen, 2017)

## 5.0 Conclusion

The educational problems in Fakfak Regency are the lack of primary school teachers in remote areas, the high population with low literacy and low school enrollment rates. The cause of the issue is limited human resources and low community motivation in developing education. The causes of such problems are the limited development of science and technology, the development of art and the uneven distribution of the population. The solution of this problem is by improving the capacity of the community with an affirmative education program or sending the best high school graduates to continue their education at universities in major cities in Indonesia. Also, the government is actively developing the capacity of educational institutions through the procurement of professional teachers from other provinces as well as the development of teacher competence.

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# **The Influence of Environmental Knowledge, Locus of Control and Environmental Attitude to the Environmental Behavior of Farmer**

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## **Abstract:**

This study aims to know the influence of environmental knowledge, the locus of control and environmental attitudes toward the environmental behavior of farmer in Maros District. This type of research is correlational research. The population of research is all heads of households who work as farmers in the vilage irrigation area at Maros regency. Samples of farmers as many as 50 were selected by Systimatic random sampling method. The variables to be considered are as follows: (a) the behavior of farmers preserving the environment (Y); (b) environmental knowledge (X1); (c) Locus of control (X2); Environmental attitude (X3). The analysis used is a statistical analysis of inferensial. The analysis model is multiple regression. The results of the research are environmental knowledge, the locus of control and environmental attitude of farmers have a significant influence individually and collectively to the behavior of farmers to preserve the environment in the village irrigation area.

**Keywords:** behaviour, the locus of control and attitude

## **1.0 Introduction**

One form of government support for the farmer's welfare is the provision of irrigation facilities. The irrigated rice fields are the most essential land resources supporting Indonesian rice production. The importance of irrigation on food security in Indonesia is 85% of rice production is sourced from irrigated rice fields and only about 11% which is rain-fed rice field (Small & Carruthers, 1991).(Pasandaran, 2016). As the built environment, the quality of the environment in irrigated areas is highly dependent on human activities. However, the agricultural activities as a dominant function of this area to trigger the occurrence of damage.

Based on the Hines theory, the factors that influence one's environmental behavior are environmental knowledge, the locus of control, environmental preservation motivation, attitudes toward the environment, social factors, skills of applying knowledge, and individual response. (Bamberg & Möser, 2007). Knowledge is the memory of an issue, manner or process. Bloom outlines three components of knowledge that are cognitive, affective, and psychomotoric components (Huitt, 2004). The cognitive component of emphasis on memory or trust, the affective component of emphasis on feelings, emotions, levels of acceptance or rejection, and psychomotor components on matters involving physical skills. Environmental knowledge is one of the factors that determine the behavior of society to preserve the environment. Consequently, the environmental education process that aims to change human behavior based on knowledge and understanding, awareness, values, beliefs, attitudes, and behavioral changes.

Locus of control is one's self-control of the physical environment and its social environment caused by internally and externally. Locus of control is a social learning theory that links the level of individual understanding to control their lives and the environment. Locus of Control or individual control center of action and belief in self-efficacy. The internal control focus is confident to be responsible for work behavior while the external control locus is in the form of an impulse to show the behavior that comes from outside. Individual beliefs stem from luck and opportunity. (Reynolds & Miller, 2015)

Furthermore, the attitude or tendency to act as a response to a particular object. A person's attitude can be measured by three components such as feeling (affection), thinking (cognition) and predisposing a person's actions (conations) to the surrounding environment. The behavior of a person takes the form of action as a reflection of the individual formed by the desire or need. (Chen & Chai, 2010). Specifically, Hungerford and Volk revealed that environmental behavior is a proof of one's responsibility to the environment.

This study aims to determine the influence of environmental knowledge, the locus of control, and environmental attitudes simultaneously to the behavior of village irrigation farmers preserve the environment in Maros regency.

## 2.0 Research Method

This research is included in quantitative research with the correlational approach. The study population is farmers in the village irrigation area in Maros Regency. The sample area was chosen by purposive sampling method, i.e. Simbang District as much as 50 heads of farming families. Data analysis techniques using multiple regression analysis to determine the influence of environmental knowledge, the locus of control, and environmental attitudes together on the behavior of village irrigation farmers preserve the environment in Maros regency.

## 3.0 Research Result

### 3.1 Description of Farmer's Behavior to Preserve the Environment

Farmer's behavior in environmental conservation in village irrigation area in Maros Regency is presented in Table 1.

**Table 1:** The Farmer's Behavior to Preserve the Environment

No	Category	Score	Frequency	Percentage (%)	Percentage Kumulatif
1	Very low	10 – 17	6	12	12
2	Low	18 - 25	38	76	88
3	Medium	26 - 33	6	12	100
4	High	34 - 41	0	0	-
5	Very High	42 - 50	0	0	-
<b>Total</b>			50	100	

Table 1 shows that 76% of farmers have low behavior in preserving the environment. The results of the descriptive statistical analysis show that the minimum value = 16 and the maximum value = 27, Moreover the average value of 20.94.

### 3.2 Description of Environmental Knowledge of Farmers

The farmers' environmental knowledge on village irrigation areas is presented in Table 2.

**Table 2:** The Environmental Knowledge

No	Category	Score	Frequency	Percentage (%)	Percentage Kumulatif
1	Very low	1 – 2,9	0	0	0
2	Low	3 – 4,9	8	16	16
3	Medium	5 – 6,9	24	48	64
4	High	7 – 8,9	12	24	88
5	Very High	9 - 10	6	12	100
<b>Total</b>			50	100	-

Table 2 provides information that as many as 48% of farmers know the environment with moderate categories. As many as 24% of farmers have high environmental knowledge. It is interesting that there are as many as 12% of farmers with a very high level of environmental knowledge. The result of descriptive statistical analysis of environmental knowledge shows that: minimum value = 4 dan maximum value = 9. Average value = 6,1. The results of the analysis indicate that the farmers' environmental knowledge is in the moderate category.

### 3.3 Description of *Locus of Control*

Farmers in village irrigation areas have low self-control. This is illustrated in Table 3.

**Table 3:** *Locus of Control*

No	Category	Score	Frequency	Percentage (%)	Percentage Kumulatif
1	Very low	10 – 17	6	12	12
2	Low	18 - 25	42	84	96
3	Medium	26 - 33	2	4	100
4	High	34 - 41	0	0	-
5	Very High	42 - 50	0	0	-
<b>Total</b>			50	100	

Farmers' self-control level is low, i.e. 84% of farmers have a locus of control with the low category. Minimum value = 17 and maximum value = 26 and average value = 20,66. The result of calculating the average locus of control value compared to the category indicates that the locus of control is in the low category.

### 3.4 Description of Farmer's attitude

The attitude or tendency of farmers to maintain the environment is presented in Table 4.

**Tabel 4:** Environmental Attitude

No	Category	Score	Frequency	Percentage (%)	Percentage Kumulatif
1	Very bad	10 – 17	9	18	18
2	Bad	18 - 25	33	66	84
3	Netral	26 - 33	8	16	100
4	Good	34 - 41	0	0	-
5	Very good	42 - 50	0	0	-
<b>Total</b>			50	100	

The attitude of farmers to maintain environmental quality is 66% which shows bad attitude or less care to environmental quality. The result of descriptive statistic analysis of environmental attitude is minimum value = 17, maximum value = 28 and average value = 20,66. The average value of farmers' environmental attitudes is between 18 - 25 or bad categories.

### 3.5 The influence of internal factors on Farmer Behavior in Preserving the Environment

Analysis of the influence of environmental knowledge, the locus of control, and environmental attitudes toward farmer behavior preserve the environment through multiple regression analysis. The result of multiple regression analysis presented in table 5.

**Table 5:** Multiple Regression Analysis ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	418,837	3	139,612	200,799	,000 <sup>b</sup>
	Residual	31,983	46	,695		
Total				R Square = 0,929		
		450,820	49	Beta X1 = 1,996		
				Beta X2 = 0,712		
				Beta X3 = 0,838		

a. Dependent Variable: Y

b. Predictors: (Constant), X<sub>3</sub>, X<sub>1</sub>, X<sub>2</sub>

Based on the result of multiple regression analysis (Table 5), it can be seen that significant  $F = 0.000$  is smaller than 0.05. The results of the analysis show that environmental knowledge, the locus of Control, and environmental attitudes have a positive effect on the behavior of farmers of preserving the environment. The value of the coefficient of determination = 0,929 indicates that the magnitude of influence of environmental knowledge, the locus of Control, and environmental attitudes simultaneously to farmer behavior preserve environment in village irighasi area in Maros Regency is 92,90%. The result of regression coefficient analysis also shows that X<sub>1</sub> (knowledge) variable has the most prominent than Beta value. These results indicate that the highest internal factor affecting environmental behavior is knowledge.

## 4.0 Conclusion

Based on the regeresi analysis, it can be seen that environmental knowledge, the locus of control, and environmental attitude of farmers have a significant influence and contribute real to the behavior of farmers to preserve the environment. Environmental knowledge has the most significant influence, followed by environmental stance and locus of control.

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## **Challenges in Mastering Higher-Order Thinking Skills: A Study from Students' Perspectives**

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### **Abstract:**

The 21st century education which emphasize on higher-order thinking learning is one of the issue often discussed by the Ministry of Education and educators nowadays. The key to determine the success of the teaching higher-order thinking skills is seen through the acquisition gain by the students through their achievement. It is undeniable that teachers play an important role as facilitators to assist students' activities in the 21st century classroom. Moreover, studies revealed that teacher is one of the factors that influenced the success or failure of students' achievement. However, the challenges or factors that faced by students in learning higher-order thinking skills get less serious attention. Therefore, this study was conducted to investigate the challenges faced by the students in mastering higher-order thinking skills from students' perspectives. Quantitative study was employed throughout this study with 132 secondary school students as the respondents. The data were analyzed using Rasch measurement model. The findings show that the cognitive aspect is the main challenges faced by the students followed by the affective aspect in mastering higher-order thinking skills.

**Keywords:** *Higher-Order Thinking Skills, 21<sup>st</sup> century learning, Students, Challenges, Rasch Measurement Model*

### **1.0 Pengenalan**

The transformation occurs in Malaysian education system nowadays crave for every students to equip themselves with basic skills and knowledge in order to face the challenges in the 21st century education (Sharuji & Mohd Nordin, 2017). The 21st century skills is in line with the six aspirations of the nation which is to produce student that can compete globally as stated in the Malaysian Education Development Plan (MEDP) (Kementerian Pendidikan Malaysia, Malaysia, 2013). Thus, one of the 21st century skills that students need to master is the higher-order thinking skills. In fact, the aim of the Malaysian education is to develop students' potential in innovative and collaborative practices and possesses creative and critical thinking skills which related to higher-order thinking skills (Noraini & Khairul, 2014). Furthermore, the implementation of the higher-order thinking skills should be done from the primary school level as this stage is the best time to cultivate the basic foundation for further education (Ikhsan & Norlia, 2005; Mohamad & Nasruddin, 2008; Seman, Yusoff & Embong, 2017).

Higher-order thinking skills are the continuation of creativity and critical thinking skills that focus on assessing, analyzing, exploring and creating aspects. However, emphasizing higher-order thinking skills is more holistic than creative and critical thinking skills, it is

more towards the application of more complex mental activity (Arni Yuzie, 2016, Nur Aida & Mohd Aderi 2014) and the needs to resolve the non-routine problems (Rajendran, 2008). Higher-order thinking skills are triggered when an individual used his or her thinking skills to deal with complex, new and challenging situations or problems (Rajendran 2008; Halimah 2009; Yee, *et al.*, 2010).

## 2.0 Background of Study

Teaching of higher-order thinking skills to encourage students to think critically is one of the main challenges for the teachers as it is a constant demand for improving students' thinking skills in teaching and learning process (Najua, Mohd Salleh & Abdul Halim, 2017). In fact, students' achievement has always been a benchmark of the success in the learning process especially related to the higher-order thinking skills learning (Mohd Rustam & Nora, 2013). However, the process to inculcate higher-order thinking skills among students is not an easy task especially in this 21st century. It requires teachers' knowledge, skills, effort and patience in order to produce skilled students. Unfortunately, some of the past studies related to thinking skills showed that the mastery level of students towards critical and creative thinking skills and higher-order thinking skills remained at low and moderate level (Siti Rahayah *et al.*, 2008; Sarimah & Shaharom 2008; Nor Hasnida *et al.*, 2011; Siti Nurliyana 2015; Suhana & Zanaton 2015).

Besides, the other challenges for students to obtain the higher-order thinking skills are they often do not understand and cannot solve and apply mathematical skills. It is because of the abstract mathematical concepts and it requires high level of reasoning and thinking skill (Sabri and Tengku Zawawi, 2006). Due to the mathematics nature that requires critical thinking, it affects the interest, enthusiasm and motivation of students in learning mathematics especially the ones related to the higher-order thinking skills (Mohd Rustam & Nora, 2013). In addition, in the 21st century education, the students need to be more active, able to generate ideas, dare to try, be able to reflect, can communicate and think critically (Kementerian Pendidikan Malaysia, 2013) which becoming a major challenges for the students to acquire the higher-order thinking skills (Abdul Halim, Nur Liyana & Marlina, 2015; Najua, 2017; Rajendran, 2008). Plus, due to lack of skills, abilities and some other obstacles, they make some of the students left behind in mastering higher-order thinking skills especially in Mathematics. This makes it difficult for them to collaborate with excellent and good students and indirectly, it makes them become a group of passive students in the classroom.

Therefore, a meaningful teaching and learning process is very important to increase students' interest and motivation to practice lifelong learning education. Hence, this study focuses on the challenges in mastering higher-order thinking skills from the students' perspectives based on the Mathematics teaching and learning process. This study is expected to help students and teachers in facing the challenges in school in succeeding teaching and learning process based on the 21st century skills.

## 3.0 Research Methodology

This study was conducted using quantitative method. A total of 132 secondary schools students were involved as the respondents in this study. The students were asked to give their response towards the challenges they faced while learning higher-order thinking skills in the classroom based on four-point agreement scale (1-strongly disagree, 2-disagree, 3-agree, 4-

strongly agree). All data were gathered and analysed using the Rasch measurement model (Azrilah, 2010; Azrilah & Saidfuddin, 2008). The items for each aspect were rank according to the measure value. Items with the lowest measure value indicate that the items were the major challenges for the students in mastering higher-order thinking skills and vice versa.

#### 4.0 Results

Rasch analysis is conducted to get the measure values in order to determine the rank of the cognitive and affective challenges faced by students in mastering higher-order thinking skills in Mathematics subject. The items with the lowest measure value show that the items are major challenges for the students to master the higher-order thinking skills and vice versa.

**Table 1:** Cognitive and Affective Challenge from Students Perspectives

Construct	Subconstruct	Mean Measure
Cognitive	Negative Perception	-0.64
	Lack of Basic Knowledge	-0.24
Average		-0.44
Affective	Lack of Motivation	-0.03

Table 1 shows the mean measure and the rank calculated for each three subconstruct. Students' negative perception (cognitive challenge) was ranked first with the lowest measure value (-0.64). It was followed by students' lack of basic knowledge which also related to cognitive challenge with the measure value -0.24. Meanwhile, students' lack of motivation (affective challenge) rank last with the measure value of -0.03.

Table 2 and Table 3 show the cognitive and affective challenges faced by the students in mastering higher-order thinking skills according to the ranked.

**Table 2:** Cognitive Challenges from Students Perspectives

Cognitive Challenges	Abbreviation	Measure	Rank
I am confused with need of the higher-order thinking skills questions	CLK	-1.30	1
I perceived higher-order thinking skills questions are difficult to be solved	CNP	-1.01	2
I could not master higher-order thinking skills as my Math basic concept is poor	CLK	-0.54	3
I perceived that I will not be able to answer higher-order thinking skills questions	CNP	-0.27	4
I could not understand specific terms (Malays/English) used in higher-order thinking skills questions	CLK	-0.10	5
I could not master higher-order thinking skills as my Math operation is poor	CLK	0.15	6
I could not master higher-order thinking skills as my Math basic calculation is poor	CLK	0.12	7
<b>Average</b>		-0.44	

Based on the table, item ranked number 1 of the cognitive challenges faced by student is item "I am confused with the need of the higher-order thinking skills questions" with -1.30 measure values. This result implies that this is the major challenges that they faced that hinder them to master and understand the higher-order thinking Mathematics questions. The



item ranked as number 2 is item “I perceived higher-order thinking skills questions are difficult to be solved” with -1.01 measure values. This result shows that students have negative thinking towards the higher-order thinking skills questions which put them into a bad motivation and interest in learning higher-order thinking skills.

However, item ranked number 7 in the cognitive challenges aspect is item “I could not master higher-order thinking skills as my Math basic calculation is poor” with 0.12 measure values. This measure value indicates that the lack of skills in basic calculation is the minor challenges for them in learning higher-order thinking skills in Mathematic. They have to practice more in order to enhance their calculation skills in answering the higher-order thinking skills questions. In other words, the cognitive challenges faced by students will affect the motivation of the students in learning higher-order thinking skills. Therefore, Table 2 below shows the affective challenges from students’ perspective in mastering higher-order thinking skills.

Based on Table 3, item “I am not confidence to answer higher-order thinking skills questions” is ranked as number 1 of the affective challenges with lowest measure values (-0.60). This item has become the major affective challenges faced by the students in mastering higher-order thinking skills. Lack of confidence among the students in answering the higher-order thinking skills questions will demotivate the students to learn more and know more. Besides, items ranked number 2 is item “I am not interested to answer higher-order thinking skills question which has many sentences” with -0.39 measure values. This result shows that students nowadays have lack of motivation when getting a lengthy questions. These findings proved that the students have negative perceptions which hinder them from mastering in answering the higher-order thinking skills questions.

**Table 3:** Affective Challenges from Students Perspectives

Affective Challenges	Abbreviation	Measure	Rank
I am not confidence to answer higher-order thinking skills questions	ALM	-0.60	1
I am not interested to answer higher-order thinking skills question which has many sentences	ALM	-0.39	2
I am afraid when need to answer higher-order thinking skills questions	ALM	-0.39	3
I am not motivated to answer higher-order thinking skills questions	ALM	-0.33	4
I am lazy to think when need to answer higher-order thinking skills questions	ALM	0.67	5
I am lazy to read lengthy higher-order thinking skills questions	ALM	0.84	6
<b>Average</b>		-0.03	

According to Table 3, item ranked at number 6 “I am lazy to read lengthy higher-order thinking skills questions” with the highest measure value (0.84) indicates that one of the challenges that hinder students from mastering the higher-order thinking skills is they are lazy to read lengthy questions. The lengthy questions become the hindrance which may due to the students’ laziness to read or perception towards inability in solving lengthy questions. Besides that, item ranked at number 5 “I am lazy to think when need to answer higher-order thinking skills questions” imply that laziness is one of the motivational factors that inhibit students learning of higher-order thinking skills

## 5.0 Discussions

Results of Rasch logit analysis as presented in the Table 1 indicates that the cognitive aspects was a more dominant source of students challenge in learning higher-order thinking skills as compared to the affective aspect. Results show that students have negative perception towards learning higher-order thinking skills in Mathematics subject (Mohd Rustam & Nora, 2013). The negative perceptions perceived by the students which related to the higher-order thinking skills questions are; the questions are difficult to be solved and they believe that they are unable to solve higher order thinking skills questions without trying. These results are aligned with the previous study which reported that holding bad perception in answering higher-order thinking skills questions correctly (Gomez-Chacon, 2000; Ho & Hyun, 2011; Mohd Rustam, 2016) will cause the declining of students' performance in acquisition of higher-order thinking skills.

The second aspect of cognitive challenge which also seems to be commonly faced among students in mastery higher-order thinking skills was lack of basic Mathematical knowledge. Previous study which conducted in the context of Malaysian Mathematics classroom has proved that poor level of Mathematics basic content knowledge become the obstacles experienced by students in learning higher-order thinking skills (Bahagian Pendidikan Guru, 2013; Siti Rahayah *et al.*, 2008; Sarimah & Shaharom 2008; Najua, 2017; Seman, Yusoff & Embong, 2017). For example, students feel difficult and confused to transform the keywords from long sentence questions into the correct mathematical operation or equation. The rationale of this situation is due to the students poor understanding in basic mathematical concepts and calculation (Singh, Rahman, & Hoon, 2010; Geary, 2004).

Besides, low abilities students tend to experience difficulties to understand the specific terms used in the higher-order thinking skills questions regardless of what language used. What is more, there are students who come from non-national typed primary school will facing more significant problem in answering higher-order thinking skills questions (Singh *et al.*, 2010, Geary, 2004; Zohar, Degani & Vaakin, 2001) as they possess poor level of reading skills.

On top of the cognitive challenge that have been described, the affective challenge which related to students' lack of motivation were the other hindering factors for students in mastering higher-order thinking skills. Students tend to show maladaptive psychological characteristics includes lack of confidence, students' laziness and the feeling of anxious throughout the learning process. According to Budsankom, Sawangboon, Damrongpanit and Chuensirimongkol (2015), maladaptive psychological characteristic has a great potential in affecting higher-order thinking skills of the students. The low level of student's motivation experienced leads them in avoiding reading and trying to solve the questions (Najua, 2017; Seman, Yusoff & Embong, 2017; Zaidatol Akmaliah, 2005). Even worse, the students will have no will to attempt, to think or to solve lengthy or complex higher-order thinking skills questions (Najua, 2017; Seman, Yusoff & Embong, 2017). This is aligned with the previous studies which indicate that students with low level of higher-order thinking skills will have lack of curiosity to discover, has less rational thinking and rarely monitor their learning which includes avoidance from trying different solving strategies (Shari, Eileen, & David, 1993).

## 6.0 Conclusion

Concisely, Mathematics is one of the crucial subjects in schools. The emphasizing on 21<sup>st</sup> century education and skills makes the learning of higher-order thinking skills in Mathematics becoming a major concern for students and teachers. In fact, the aim of the 21<sup>st</sup> century education is to produce highly competence students that can compete globally. However, this study found that students' cognitive ability, prior knowledge, interest and motivations were the challenges faced by the students in mastering the higher-order thinking skills. Students who faced the cognitive challenges will eventually affects theirs affective aspect which will lead to demotivation in learning higher-order thinking skills in Mathematics. Thus, teachers play an important role in order to inculcate higher-order thinking skills and help the students to overcome these challenges that hinder them from mastering the higher-order thinking skills. Nevertheless, students' achievement is depend on the effective teachers which can manage and plan their teaching and learning process to become meaningful and helpful for the students. Teachers and students need to mutually related to each others in achieving the aims of the Malaysian education system.

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# **Continuous Professional Development (CPD) Among VET Teachers Teaching Pendidikan Vokasional Menengah Atas (PVMA) Subjects at Academic Schools in Malaysia**

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## **Abstract:**

The Technical and Vocational Education and Training (TVET) in Malaysia are embracing changes that pose impact on the landscape of education. In line with the Ministry of Education (MOE) goal of enhancing student enrolment in TVET, the role of teachers as the main catalyst for TVET transformation is important for the realization of MOE's expectation towards impactful education in the country. With the pedagogical strength in the curriculum, the teachers need to practice continuous professional development (CPD) to ensure they are always relevant to the change of the dynamics educational scenario in Malaysia. The Pendidikan Vokasional Menengah Atas (PVMA) programme that is implemented in secondary schools, contributes to the enhancement of the supply of skilled and semi-skilled workforce for national development. Teachers play important roles to ensure that the PVMA curriculum is pertinent and follow the needs of MOE. The current study aim to identify PVMA teachers' level of professional competence based on knowledge, skills and professionalism value. This study also seeks to identify the CPD requirement based on knowledge, skills and professionalism values of teachers. This study will involve VET teachers from academic schools which offer PVMA subjects in southern Malaysia (Negeri Sembilan, Malacca and Johore). The study will use questionnaire as major data collection tools. This study is expected to be able to provide useful information regarding the level of teacher's professional competence as well as the needs of CPD for their career.

**Kata kunci:** Amalan Kepimpinan Transformasi Guru Besar, Komitmen Guru

## **1.0 Introduction**

Enduring the challenges in designing an effective and comprehensive Continuous Professional Development (CPD) strategies for teachers in the realm of 21st century teaching and learning is important. CPD is an individual development path required by all teachers in order to improve both teaching and learning (DiPaola & Wagner, 2018; Abdul Rahim Abdul Rashid, 2000). Emphasis on high pedagogical quality requires teachers to make effort in embracing any transformation that is implemented by the Ministry of Education. Teacher professional development is a continuous process over time that provides teachers with the opportunity and experience in a formal and non-formal setting. The Ministry of Education (2001) stated that the key milestone in education transformation is the development of teachers' professionalism. Development of teacher professionalism is essential to ensure Malaysian teachers whom are the implementers, are continuously relevant to the current working environment. In the efforts of the Ministry of Education (MOE) to improve the quality of education, teacher are urge to enhance their work performance to ensure that they are relevant to current changes (MOE, 2014). As teachers and the implementers, teachers

need to be responsive of the latest changes and needs in education. Further, as the backbone of TVET transformation, TVET teacher requires a high level of professionalism to ensure they are well-prepared in any situation. According to Robiah Sidin (2002), teaching professionalism is related to high quality, ethical and ethical work practices. Competent teacher work practices include professional competence that is a combination of the aspects of knowledge, skills and personal characteristics that must be owned and practiced in fulfilling the task that has been entrusted. Having all these competencies allows TVET teacher to be fully ready to perform their duties and responsibilities (MOE, 2014).

## 2.0 Problem Statement

The restructuring and upgrading of the current MPV at academic schools (Sekolah Menengah Kebangsaan, SMK) has been recognized as one of the Technical and Vocational Education and Training transformation strategies based on the Mid-Year Review meeting by the Ministry of Education Malaysia (MOE) on 14 August 2014. According to the 206th Education Planning Committee meeting on March 11 2015, PVMA which is implemented in 2015 is considered as TVET transformation's main focus under MOE's Key Performance Achievement (MOE, 2015). The Pendidikan Vokasional Menengah Atas (PVMA) pilot program has started in 2015 involving 213 schools running vocational subjects (Mata Pelajaran Vokasional - MPV) which involve 5325 students' enrolment. In 2017, 269 schools involving 7,321 students enrolled in PVMA. Reviewing the history of TVET worldwide, most countries started vocational education at the school level. European countries recorded 60% of the involvement of secondary school students in vocational education, while Asian countries such as China, Thailand and Indonesia were also at the same percentage level of 60%. On-Job Training and employment generation for the industry have been widely implemented in continental Europe and most Asian countries at the school level. There are also schools that carry out vocational education using the semester system while China and Singapore have begun vocational education for primary students. The ratio between the vocational and academic components in foreign countries is also high at 70:30 (MOE, 2011).

The implementation of PVMA program at academic schools is a challenge for the teachers because it requires high level of knowledge, skills and professionalism especially while executing the Teaching and Facilitating concept - Pengajaran dan Pemudahcaraan (PdPc) - in the practical/ hands-on classes. As individuals who are responsible for producing future students as skilled and semi-skilled workers, teachers need to have a high level of competence in terms of knowledge, skills and attitudes (Mustafa *et al.*, 2012). This is to ensure the implementation of MOE curriculum in educational institutions is effective. The effectiveness of teachers' classroom teaching is influenced by the level of readiness of the teacher which includes various aspects of teaching content, teaching process delivery, pedagogical knowledge and personality knowledge and teaching profession as well as emphasizing on improving instructions in schools (Irby & O'sullivan, 2018; Mok, 2001). In addition, teachers are also responsible to comply and implement all policies set by the MOE (Abd Rahim Abd Rashid, 2005).

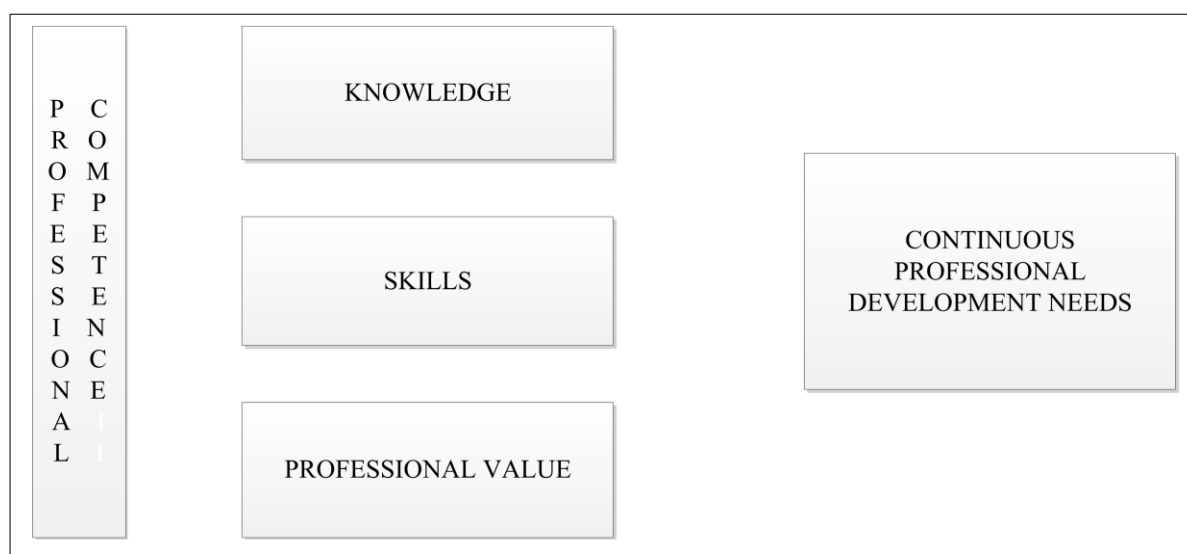
According to Dadang Kurnia & Ilhamdaniah (2013) in Faridah *et al.* (2014), in the official reports from World Bank and UNESCO-UNEVOC, teachers, particularly those from developing countries (Southeast Asian region) are reported for not complying to the work demands. Teachers are found to be lacking in pedagogical skills and ineffective in classroom delivery. This situation has resulted in students being passive in the classroom and this definitely does not reflect teacher professionalism. Noridahayu *et al.* (2014) alleged that

teachers' competence in developing students' creativity while conducting practical work are essential. The lack of student's involvement in the teaching and learning process may result in students being absent from school and unable to complete the assignment given by the teachers. Therefore, being well-prepared to teach will increase students' perception of teachers. The transformation of TVET requires emphasis on the VET teachers' continuing professional development to achieve desired goals aimed by MOE. The continuous development of teachers' professionalism should include efforts on enhancing teachers' skill and knowledge in implementing the curriculum. The newly-version of implemented PVMA is an opportunity for teachers to exhibit their true abilities in managing classroom and hands-on classes. A clear understanding of the curriculum that will be taught will assist teachers to become more confident in conducting the teaching and learning.

### 3.0 Research Questions

- i. What is the level of professional competence of PVMA teachers in terms of knowledge, skills and value?
- ii. What are the continuing professional development needs for teachers in implementing the PVMA program curriculum?
- iii. What is the relationship between knowledge, skill and professional value of teachers with CPD needs in implementing the PVMA program curriculum?

### 4.0 Conceptual Framework



**Figure 1:** Conceptual framework of the study

*Adapted and modified from the Handbook of Continuous Professional Development Model (Ministry of Education Malaysia, 2015)*

### 5.0 Literature Review

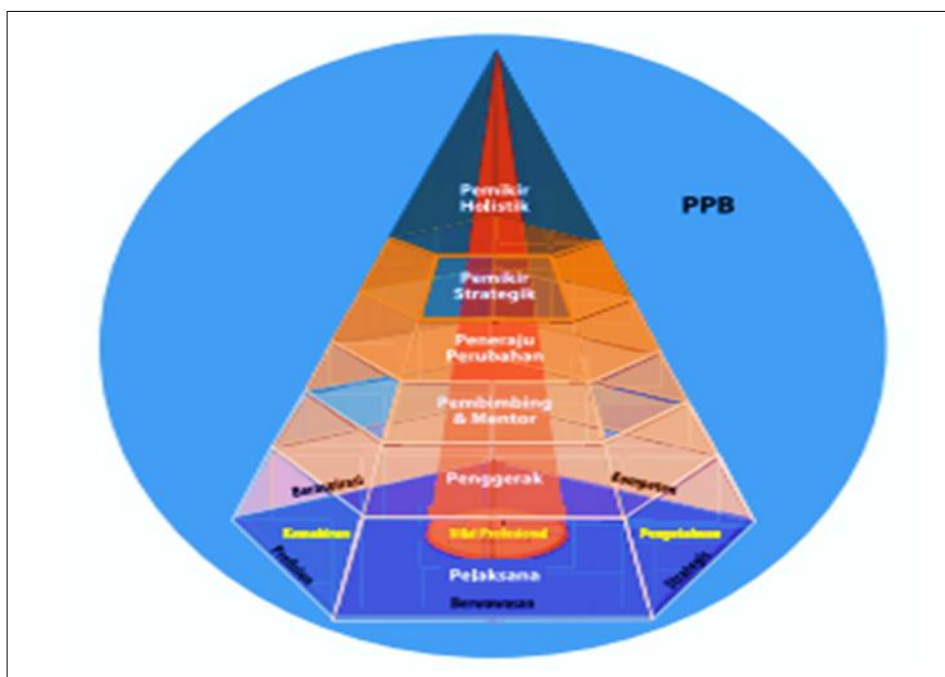
#### 5.1 Teacher Continuous Professional Development

The Continuous Professional Development Plan (CPD) 2013-2015 is an effort to improve the overall quality of education landscape in Malaysia (Ministry of Education, 2014). As an educational transformation proxy, the development of teachers' competence has



become the ministry priority to ensure that teachers can improve their skills, competencies and potential. In the transformation of *PVMA*, teachers must strive to implement the curriculum with full accountability. Competent and qualified teachers are factors which drives the student's motivation to success. Enhanced student's performance has been an identifier of job satisfaction as an educator. The transformation of TVET program in schools provides opportunity for teachers to carry out CPD to ensure that they are always aware of any changes that occur in the education world. Existing educational knowledge needs to be improved to ensure the effectiveness of an educational transformation. To improve the quality of teacher education, every educator needs to have good skills, abilities and attitudes while in school and in particular classrooms (Azizi *et al.*, 2010). An active transformation in TVET has put an expectation for VET teachers to improve existing classroom teaching approaches.

The ministry is emphasizing for teachers' development particularly in the aspect of competencies and expertise; aim to improve the quality of human resources among educational cadre. It is hoped that with an effective CPD approaches, teachers' interest and commitment towards a meaningful teaching and learning will be stimulated. As mentioned by Spencer, Harrop, Thomas & Cain (2017), teachers need emotional support and assistance in the area of behaviour management, ideas for remarkable classroom activities and insightful conversations about teaching. In addition, CPD provides a platform for teachers to strategize their self-development through an invigorating career path in this education world. Based on the CPD Plan developed by MOE, teachers need to analyse the strengths, weaknesses, opportunities and threats (SWOTs) that are the basis of action to strengthen their career paths. More critical reflection is needed to determine the development of professionalism and career paths according to teacher's preferences. Although teachers have experience in their field, knowledge and skills need to be constantly upgraded in line with task challenges and are always ready to accept any form of change.



**Figure 2:** Continuous Professional Development Plan  
Sources: Kementerian Pendidikan Malaysia (2014)

Figure 2 shows the Continuing Professionalism Development (CPD) Model developed by MOE for Malaysian teachers. Based on the diagram above, teachers begin as implementers and will increase their role from drivers, mentors, leaders of change, strategic thinkers to the level of holistic thinkers. At each level, teacher needs to have the competence and elements that are compatible with the role. By implementing this CPD Model, teachers will become more focused, creative and critical. This CPD Model is established to ensure teachers are always relevant in the education world where they can improve the quality of national education in order to be able to stand out with the quality of the other country in. In specific, CPD Model will be able to:

- i. Help teachers improve student's performance in order to meet the needs of today's labor market;
- ii. Guide teachers' experiential learning through the latest knowledge and skills in education;
- iii. Improve performance and productivity;
- iv. Developing competencies, potentials, talents and the quality of the equivalent of teachers in high-achieving countries in education;
- v. Stimulate lifelong learning so as to contribute continuously and effectively; and
- vi. Fulfilling self-satisfaction through enhanced professional image and career advancement.

## 6.0 Methodology

There are various research techniques that researchers can utilize to obtain data. This will depend on the purpose, situation and the competences of the researcher. In this study, quantitative research design will be employed. Research instrument will be in the form of questionnaire that will be distributed among teachers who teach *PVMA* at academic schools in Malaysia. A pilot study will be conducted to examine this newly-developed questionnaire. Data obtained from this questionnaire instrument will be analysed descriptively using Rasch Measurement Model as well as classical test theory using SPSS software.

## 7.0 Expected Findings

Through this study, the level of professional competence of teachers in terms of knowledge, skills and value of professionalism in implementing the *PVMA* program and the needs of *PVMA* program teachers in their professional development will be identified. The researcher will be able to assess the background of teachers involved in the *PVMA* program in order to provide appropriate information on the current implementation of the *PVMA* program at the secondary level in Malaysian academic schools. It is hoped that *PVMA* program teachers can implement the transformation of TVET with a high level of competence in order to uplift the technical and vocational images. Additionally, the outcome of this study will add value to the implementation of the *PVMA* program in schools and provide information to the Ministry of Education on the need for continuing professional development of VET teachers.

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# Strategy of Clean Water Providing to the Community Around Lake Tempe, Indonesia

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## Abstract:

The provision of clean water to the community is the obligation of local government. However, the declining quality of water sources resulted in the government having to find a practical strategy. The article describes about strategy clean water provision. This article describes the results of study on the utilization strategy of Lake Tempe as a source of clean water. The quantitative approach by analysis data of expert judgement based on an instrument. The focus of research are community role, technology development and the environmental quality. Socio cultural aspect is an important part of community role in utilizing Lake Tempe as a source of clean water. Furthermore, technological development supports for providing clean water that useful to increase the service coverage. Finally, the expert considered regarding to the environmental aspects that quality of water resource is the main priority. The results of this study became a consideration for the government in the clean water distribution for the community in around the Tempe Lake, Indonesia.

**Keywords:** Strategy, Priority, and Water Resource

## 1.0 Introduction

The availability of clean water in a residential area is closely related to health and environmental conditions. The problem of clean water availability for the world's population is also expressed in the Millennium Development Goals target of 2015 (MDGs) that is 68.9 percent of Indonesia's population have access to clean water. (Leblanc, Arnold, & Arnold, 2014). The issue of clean water availability is evident in the low water quality and the continuity of the non-guaranteed flow rate. Even some areas are still "need special attention" to the target of sustainable access to clean water and basic sanitation (Patunru, 2015)

Indonesia has thousands of lakes and serves as a source of clean water for the community. The lake ecosystem consists of water catchment areas, borders and lake waters. silting and narrowing, lake water quality pollution, loss of biodiversity and the growth of weeds of water and algae. The quality of the lake is closely related to the quality of life of the surrounding community, both as a source of clean water and agricultural activity.

Lake Tempe as one of the water resources experiencing degradation of visible shallow and abundant water weeds. The siltation causes a decrease in the capacity of the container being the problem of water weeds due to the growth of water hyacinth (*Eichhornia crassipes*), watercress (*Ipomoea aquatica*) and other plants. (Yang *et al.*, 2016). Closure of water bodies with aquatic vegetation increases from year to year. The research by Tjahjaningsih *et al.* (2014) shows that. Monitoring analysis of the coverage area of water hyacinth with digital image illustrates the percentage of water hyacinth cover in 1989 covering 9%, in 2000 increased to 31%, 76% year and year 2010 by 69%.

Tempe lake water quality conditions greatly affect the quality of life. The area of Lake Tempe is very fluctuating depending on the season. During the dry season, Lake Tempe has

an area of 10,000 ha with water depth between 0,50 - 2,00 m. This area increased to 28,000-43,000 ha with an average depth exceeding 6.00 meters. (Soeprbowati, 2015). Based on the mapping and field survey analysis, the result shows that there is a decrease of lake area of 19 973 Ha and is expected to continue to shrink in the future. The area of shrinking lakes is also accompanied by an increase in the area of settlements and area wetlands. Residents of the area are mostly permanent inundation (inundated for more than six months) and have difficulty accessing clean water. People use lake water as the fulfilment of their clean water needs. In reality, the water conditions of Lake Tempe are highly polluted due to its hydrological conditions.

Hydrologically, Tempe Lake is an estuary of several rivers included in Bila Watershed and Walanae Watershed. The catchment area of Bila River is 1,368 km<sup>2</sup> with drainage over 100 km. Walanae River has a catchment area of 3,190 square kilometres. Lake Tempe occupies a region that is divided into three areas of local government that is Wajo Regency (54.6%), while Soppeng Regency (34.6%) and Sidenreng Rappang Regency Sidrap (10.7%). Human activities in water catchment areas are the determinants of water quality. Agricultural activities dominate community activities in water catchment areas. Consequently, Lake Tempe has water contamination sourced from nitrogen and phosphorus. The condition of water pollution and water utilisation by the community requires the existence of clean water service as a whole. An economical choice is the provision of water communally and distributed with pipelines. This provision begins with improving the quality of clean water, shelter and distribution.

The common water supply system is a water supply system managed in a participatory manner by the community. Water management by community groups is sustainable because it is exclusive and can not be accessed by other groups. However, the provision of support facilities and capacity building of the community is the responsibility of the local government in meeting the needs of the community. Several criteria for sustainability of clean water supply system: drinking water management system, water quality and quantity, operational and maintenance, financing, community institutions, water resources protection and inter-institutional cooperation. Further, the reference Brikké, Bredero, Supply, & Network (2003), described that the four factors that become sustainability of common water supply system that is technical factors, community factors, environmental factors and institutional factors. Technical factors related to supporting technology along with the availability of skilled personnel in operation and maintenance. This factor must be supported financially to ensure service sustainability, spare parts costs and total operational and maintenance costs. The main factor of society is its participation in the provision. The willingness to pay by the community is a fundamental element in service sustainability. Also, involvement in the maintenance of technical facilities, as well as minor improvements, is a contributing factor of providing clean water sources.

Environmental factors are characterised by the maintenance of clean water quality in the form of conservation of water catchment areas and protection from potential pollutants. Collective behaviour factors influenced by community knowledge and awareness about the importance of clean water and sanitation for health. UNESCO establishes three criteria that support the sustainability of public water supply, environmental, technological and community criteria (Castro, Msuya, & Makoye, 2009)

## 2.0 Research Objective

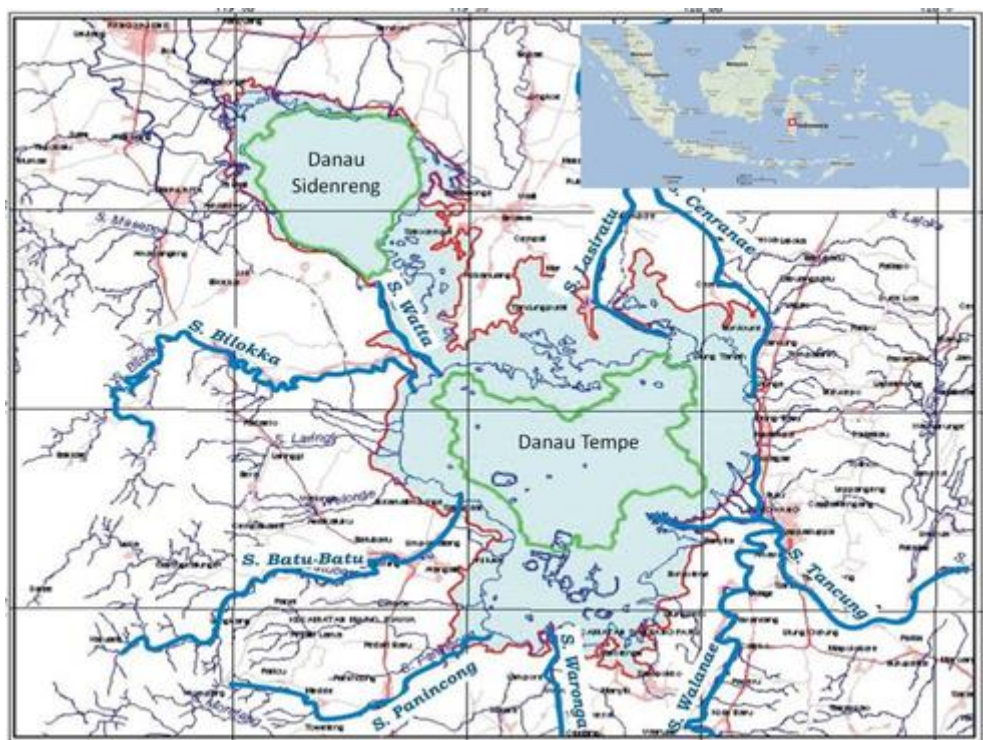
This study aims to obtain a strategy for the provision of clean water to communities around Lake Tempe. The results of this study are used as input for local governments in developing water resources and fulfilment of community rights in access to clean water.

## 3.0 Research Method

This research is a quantitative descriptive research using AHP analysis. The data analysed is the expert judgment based on the instruments referring to the pairwise comparison scale (Saaty & Kearns, 2014). Data collection in Wajo District, South Sulawesi Indonesia between March-May 2017. Seven experts become research informants representing local government, community leaders and academics. This study analyses three variables: environment, technology and community. Output analysis is the value of the criterion weight that indicates the low level of importance. The higher the value of the weight, then the criteria is increasingly important to be resolved. The number of weight values for each variable is 1,000.

## 4.0 Result and Discussion

Lake Tempe is one of the flood plain type lake located in Wajo, Sidrap, and Soppeng Regency, South Sulawesi Province. The Tempe Lake formed from the depression of the Asian-Australian plate is located in the Walannae Cenranae River region at an altitude of 10 msl. (Figure 1)



**Figure 1:** Tempe Lake Location

There are 23 rivers as Lake Tempe inlet such as Lawo River in Soppeng, Batu Batu river in Soppeng, Bilokka River in Sidenreng Rappang, Bila River in Wajo and Walannae River in Wajo. Based on the occurrence, the lake is one of tectonic lake in Indonesia. In various

literatures, Tempe Lake was originally a waters link between Makassar Strait, Bone Bay, and Pare-Pare Bay. So Lake Tempe is a waters that separates the island of Sulawesi north and south. These waters form at the end of the Ice Age (approximately 20,000-10,000 years S.M.) where the icy land begins to melt, and the sea water begins to rise. Several centuries later, about 10,000-6,000 years S.M occurred geological process of shifting and collision of tectonic plates. The clash between the Australian Plate and the Eurasian Plate has led to the rupture of the area around Lake Tempe Purba. This land lift separates Lake Tempe into three parts of waters, namely Lake Buaya, Lake Sindreneng, and Lake Tempe. The natural activity continues and transforms the ancient Lake Tempe into the present Tempe Lake.

#### **4.1 Community Role for Sustainability Clean Water Source**

Community involvement in clean water management is important aspects. There were four component of community as the ability to involve in management. The main strategy in public water supply on community criteria is sociocultural factors. Furthermore, the second support strategy is the community capacity in clean water management. Social and cultural issues in Indonesia primarily residing in the coastal areas of lakes and seas are the habit of disposing of waste and faeces in water bodies. The condition of environmental sanitation is very low as it does not have latrines and sewer.

Daily habits interpret environmental behaviour. The behaviour is formed by the attitude and knowledge of environmental management (Lullulangi, Ardi, Pertiwi, Bakhrani, & Dirawan, 2014)

Willingness to pay is the willingness of the community to pay the cost of clean water management. Participatory managed water management has an impact on the low level of local government subsidies. With such management, the financing of water management becomes higher. The burden of funding is fully borne by the community. (Isham & Kahkonen, 2002).

Aspect sociocultural regarding to water supply strategy has many problems, such as:

- i. The poor of community participation to maintain of environment. The habit of people to dispose of waste in water bodies causes the water quality of Lake Tempe.
- ii. Public perception that clean water service is a right that must be fulfilled by the government causes a passive attitude to participate in the provision of clean water.
- iii. The absence of a community involvement mechanism in protecting the water quality of Lake Tempe.

#### **4.2 Technology Development for Sustainability Clean Water Source**

In technology aspect, Lake Tempe water source can be managed by considering complexity, human resources, service level and cost of operation and maintenance.

The results of the analysis show that service levels are a priority in the strategy of providing clean water. Service level is the range of clean water services measured from the distance to which the water is taken with the residents' residence. This value can also be measured by the average travel time of the community in obtaining clean water. If the distance of taking water as far as 1000 meters or travel time more than 30 minutes, then the possible condition of public health is very low. Conversely, if a resident's home is equipped

with tap water, then it can be guaranteed that the hygienic state of the community is good. (Howard, Bartram, Water, & Organization, 2003)

The next strategy is human resources or the quality of human resources in the procurement of clean water facilities and maintenance. Cost of operation and maintenance includes maintenance of infrastructure such as pumps and piping. Also, the maintenance of water quality regarding physical, chemical, biological and microbiological aspects must be considered (Gleick, 2014)

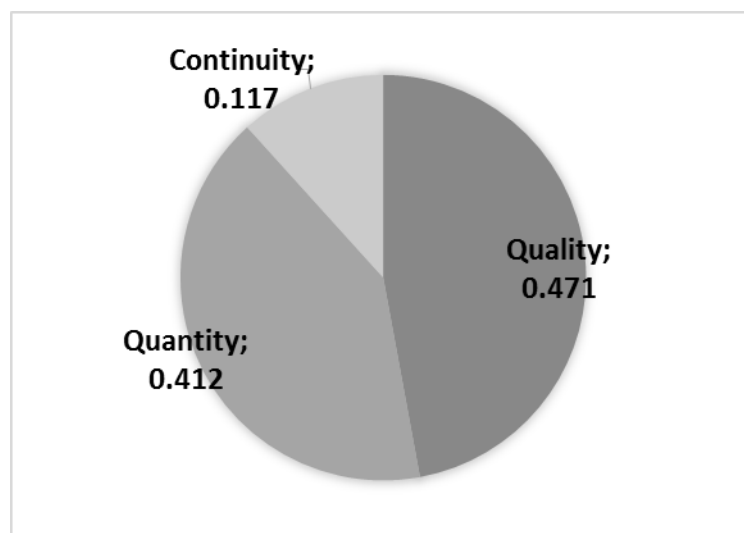
The level of clean water service that is the main priority covers various problems, namely:

- i. Domestic water demand is the amount of water needed by the community for its household activities. The more the population, the level of water demand is also increasing.
- ii. Water supply facilities covering land, water pumps, reservoir tanks, pipelines and distribution systems
- iii. The management institution responsible for maintaining the sustainability of clean water services.

#### 4.3 *Environmental Strategy for Sustainability Clean Water Source*

Environmental strategy is an effort to maintain the availability and quality of clean water for the community. Quality indicates that clean water sources according with drinking water criteria and accompanied by maintenance and source protection from pollutants. Quantity is the volume of water consumers use for domestic, usually expressed in litres per capita per day. Medium continuity shows the percentage of time during which water is available either with daily, weekly or seasonal units. (Edition, 2011)

Based on the expert judgment, then the main strategy in maintaining the quality of the environment related to water quality



**Figure 2:** Environmental strategy in water supply

Based on Figure 2, the expert considered that the priority of environmental strategy is quality. While the quantity was second priority for strategy. This is related to the fact that



water discharge can meet the needs of the community. During the dry season, the water discharge in Lake Tempe is very low, but the well water source can be used as a source of clean water. The water quality problem at Lake Tempe is very complicated. In the rainy season, the turbidity of water is very high due to the large number of sediments and organic materials carried by the river. Also, the colour of water is also very worrying because of the substance in the water. The biological condition of the water is also very low due to the habit of disposing of faeces and waste in the lake, so water contains high contaminants.

The preparation of the program as a strategy implementation is based on the water quality issues at Lake Tempe. Secondary data search results and field observation obtained the following description of the problem:

- i. Low water quality. Data on the Regional Environment Agency of 2015 shows that physical parameters that do not meet water quality standards are the color of water, conductivity, turbidity, TSS and TDS. Unqualified kimi parameters are BOD, Phosphate Content and nitrite and nitrate content, Pb, Cd, Cu and Zn content. Water quality is caused by residential waste and agricultural waste.
- ii. Eutrophication due to the high nutrients in plants.
- iii. Increasing volume of aquatic plants. Based on data on BLHD in 2015 there are 15 species found in Lake Tempe (Table 1)

**Table 1:** The species of water plants in Lake Tempe

<b>Species</b>	<b>Family</b>
<i>Brachiaria mutica</i>	Gramineae
<i>Oryza sativa</i>	Poaceae
<i>Murdannia sp</i>	Commelinaceae
<i>Rhynchospora corymbosa</i>	Cyperaceae
<i>Ludwigia</i>	Onagraceae
<i>Alternanthera</i>	<i>philoxeroides</i> Amaranthaceae
<i>Hydrilla verticillata</i>	Hydrocharitaceae
<i>Najas indica</i>	Najadeceae
<i>Eichhornia crassipes</i>	Pontederiaceae
<i>Pistia stratiotes</i>	Araceae
<i>Ipomoea aquatic</i>	Convolvulaceae

The main problem in the management of lakes in Indonesia is also caused by environmental authority and policy. Related to local government policy, issue is the watershed boundaries that are not similar to administrative. By him, the management of the lake must be integrated and consider various aspects.

## 5.0 Conclusion

Socio-cultural aspect is an important part of community role in utilizing Lake Tempe as a source of clean water. Furthermore, technological development supports for providing clean water that useful to increase the service coverage. Finally, the expert considered regarding to the environmental aspects that quality of water resource is the main priority. The results of this study became a consideration for the government in the clean water distribution for the community in around the Tempe Lake, Indonesia.

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# **The Dual Expertise Program as Part of Vocational High School Revitalization Policy in Indonesia**

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## **Abstract:**

One of education policy for preparation of quality human resources in Indonesia is Vocational High School Revitalization. The Dual Expertise Program as the part of policy aims to meet the needs of productive teachers at Vocational High School conducted since 2016. This program shaped the transfer of teachers or the addition of teacher tasks from the adaptive subject teachers into productive subjects teachers. This study aims to analyze the effectiveness of the program, especially in the Computer Engineering and Networking Program. The results showed that the effectiveness of the program in the low category. The results of the competency test showed that most participants have low competence. The constraints faced during the implementation of this program are the limited number of facilitators, less supportive facilities and infrastructure and the readiness to attend the training and the age of the participants.

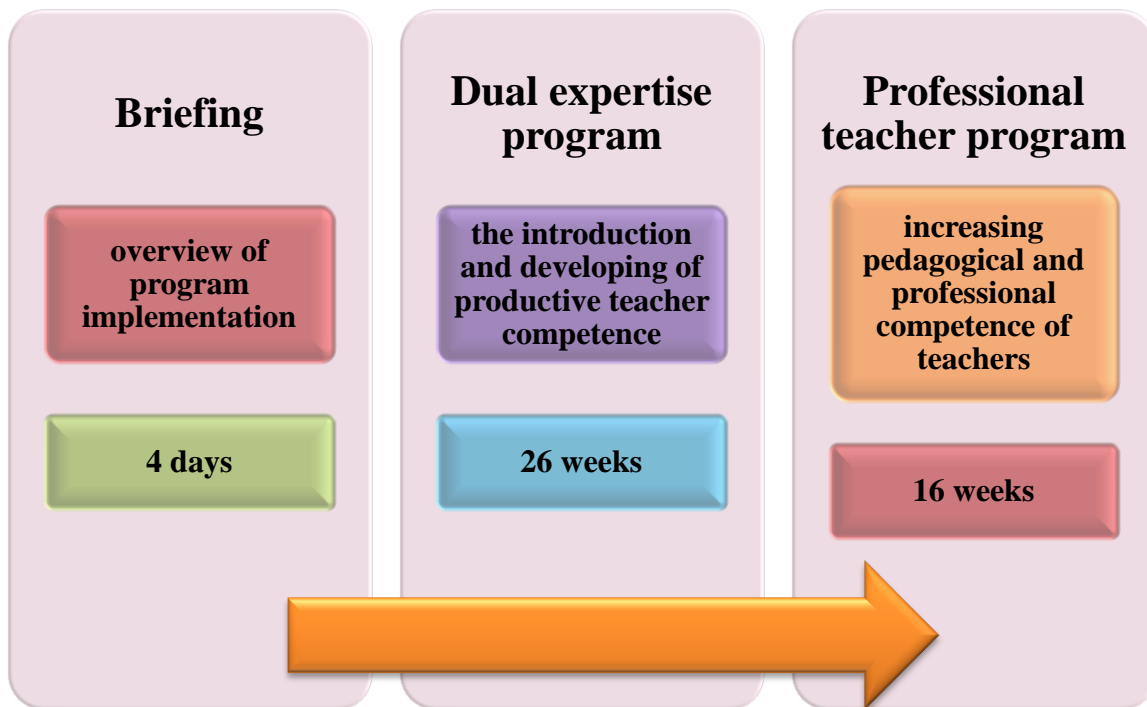
**Keywords:** Effectiveness, Dual Expertise and Vocational High School

## **1.0 Introduction**

Vocational education aims to prepare skilled workers to meet the needs of workers in accordance with the demands of the industrial world. This policy is in response to the issue of increasing unemployment and the opening of formal and informal sectors requiring high quality middle-class workers. The policy of developing vocational high schools in Indonesia is based on the needs maps of labor and competency maps required.

Conditions in 2016 show that there is still a lack of productive teachers in vocational high school 91,861 with details of 41,861 in SMK Negeri and 50.000 in private SMK. Various government programs to increase the number of productive cultivation are Dual Expertise Program, Outsourcing teacher, internship program, and new teacher recruitment.

By 2017, the government plans the addition of productive teachers through certification of 15,000 teachers and certification expertise. A dual skills program that trains non-productive subject teachers to be productive teachers of skills in vocational high schools. The dual skill program consists of three stages with a total time of 42 weeks. The program stages are presented in Figure 1.



**Figure 1:** Dual Expertise Program Stages

As an effort to improve program quality, effectiveness measurement is an important study. Effectiveness is a measurement of achievement of predetermined program objectives or description of achievement of program targets (Handyaningrat, 2006; Sedarmayanti, 2006). Each program should cover at least five aspects: 1) Objectives of the activities to be achieved. 2. Activities taken in achieving the objectives. 3. Rules to be held and procedures to be passed. 4. Estimated budget required 5. Execution strategy.

This study measures the effectiveness of Dual Expertise Programs especially for the Computer and Network Engineering expertise package. The measure of effectiveness refers to the achievement of teacher competence following a dual skill program.

## 2.0 Literature Review

### 2.1 Teacher Competence

Competency is the ability to do something successfully or efficiently. Specifically for teacher profession, there are four kinds of competence : Pedagogic competencies, Personality competence, Social competence and Professional competence.

Pedagogic competencies include understanding of teachers to learners, planning and implementation of learning, evaluation of learning outcomes, and development of learners to actualize the potential they have. Pedagogic competence is considered a professional standard that will enhance and complement the role of teachers as a profession (Gliga, 2002). Understanding pedagogic competence can be deciphered into the ability to solve pedagogical problems by applying knowledge, experience, values, and talents creatively so as to obtain appropriate and effective results (Suciu & Mâtâ, 2011).

Personality competence is a personal ability that reflects the personality and role model for learners. A teacher must have personality competence such as discipline, honest and fair, noble, exemplary, stable person, stable, mature, wise and patient, authoritative, and have confidence (Rochman & Gunawan, 2011). Teacher personality competencies contribute positively to student motivation and discipline (Kheruniah, 2013).

Social competence is the ability of teachers to communicate and get along effectively with learners, fellow educators, education personnel, parents / guardians of learners, and the surrounding community. The teacher's social competence is very supportive in teaching and learning process, both in the classroom and outside the classroom (Ashsiddiqi, 2012). A teacher must have a good social life to support the teaching and learning process. Social competence means the ability and skill of a teacher with social intelligence to communicate and interact with others such as students effectively in the implementation of teaching and learning process. Teacher social competence is needed in teaching and learning process to have teacher as role model for student in developing student with conscience, concern and empathy for others.

Professional competence is a mastery of learning materials widely and deeply in accordance with the field of knowledge. Professional teachers at least have intellectual ability, understand the vision and mission of national education, be able to transfer knowledge to students effectively, understand the concept of child psychology development, able to organize learning process, and have creativity and art to educate (Jihad, 2013). The professional competence of teachers who are able to improve the standard of teachers as the education implementer which is the determinant of the achievement of educational goals (Ananda, Mukhadis, & Andoko, 2012).

## **2.2 Dual Expertise Program**

Dual Expertise Program is the diversion and / or addition of teacher tasks from the adaptive subject teachers into Vocational High School productive on specific skill competencies according to their interests and talents. Adaptive Teachers are teachers who teach English, Mathematics, Natural Science, Physics, Chemistry, Social Science and Entrepreneurship in Vocational High School. Furthermore, productive Teachers are teachers who teach subjects on a specific skill set or skill competency in accordance with the Basic of Vocational Competencies and Vocational Competencies. The program consists of three components, participants, facilitators, and places. Participants on the activities are all participants of Dual Expertise Program that have been verified by the Ministry of Education quality control team. The facilitator consists of instructors and lecturers from competent universities, and experts or practitioners of industries. The training places are referral schools or accredited schools, technical training centers, industry or or relevant universities.

## **2.3 Program Design**

Dual Expertise Design by using sandwich system On-In-On-In service training. The design of Dual Expertise Program implementation is carried out through several activities (Figure 2):

- i. Guided independent learning. The program is conducted in schools where teachers teach or at other school as on-service training places.
- ii. Education and training (In-Service Training).

- iii. Internship Program Industry.
- iv. Teacher Certification Program.



**Figure 2:** Dual Expertise Program Implementation Design

Program management is supported by Management Information System (MIS) that can be accessed by organizers spread in 27 provinces in Indonesia. This information system facilitates the implementation of following the flow of information to be done according to the package of expertise and the area of their respective duties.

### 3.0 Research Method

This study uses documentation method that is analyzing competency documents of participants. This study specifically examines teacher competency data in Computer and Network Engineering expertise in South Sulawesi. The sample size is 25 participants. Selection of areas of expertise based on the consideration that computer and networking techniques is a program that many interested by the participants. The effectiveness of the program is divided into four categories namely very high, high, low and very low.

### 4.0 Result and Discussion

#### 4.1 Description

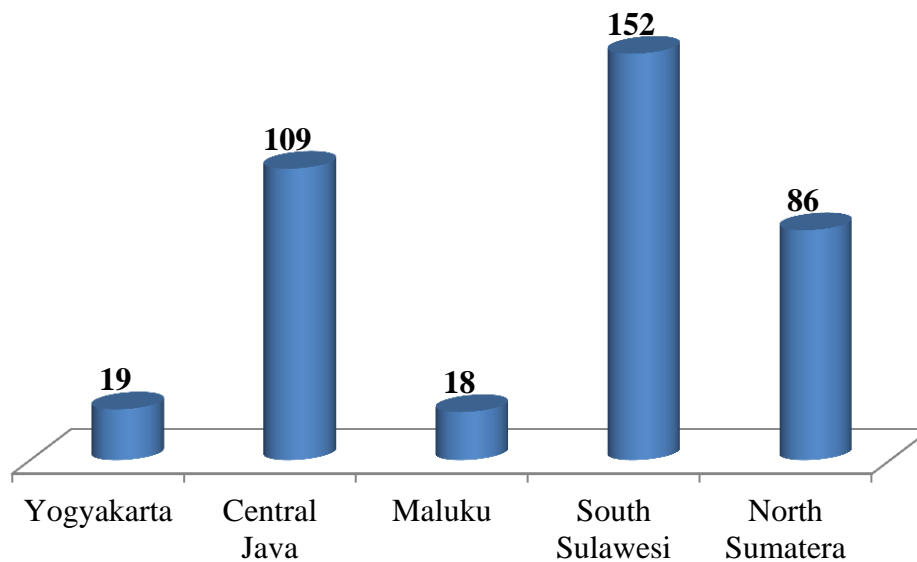
The dual expertise program is held in 2017 involves a total of 1,120 participants from all over Indonesia. Specifically, the division of the number of participants for each skill pack is presented in Table 1.

**Table 1:** Number of Dual Experts Program Participants

Expertise Packages	Number of Participants
Agribusiness Fisheries	49
Aquaculture	9
Multimedia	310
Nautics for Commercial Ship	35

Expertise Packages	Number of Participants
Nautics for Fishing Vessel	133
Software engineering	132
Computer Networking Engineering	384
Technical for Commercial Ship	9
Technical for Fishing Vessel	36
Teknologi Pengolahan Hasil Perikanan	23
<b>Amount</b>	<b>1,120</b>

The package expertise for Computer Networking Engineering is part of the study program of Computer and Informatics Engineering expertise. This program is much in demand by the participants compared to the other nine fields. Most of the program participants came from South Sulawesi Province as many as 152 people and the lowest came from Maluku Province as many as 18 people (Figure 3).



**Figure 3:** Number of Participants Package of Computer and Network Engineering Expertise

#### 4.2 The Effectivity of Program

The materials is trained in the Dual Expertise Program consist of four modules, namely Data Communication module, VoIP Data Communication, Operating System, and Network Service Administration on Basic Server. After attending the training, participants were tested using computer-based tests in accordance with the material being studied. The results of the test were used to test the effectiveness of 25 participants.

The competence documentation results show the maximum value of 82.50 and the lowest score of 43.50. Category distribution is calculated based on the range of participants divided by four. The results of program effectiveness analysis are presented in Table 2.

**Table 2:** Effectivity of Program

Quality	Interval	Frequency	Percentage
Very Low	41.00 - 51.99	4	16
Low	52.00 - 62.99	12	48
High	63.00 - 73.99	7	28
Very high	74.00 - 84.99	2	8
<b>Amount</b>		<b>25</b>	<b>100</b>

Based on the above table, there are 16% of participants who have very low test results, 48% are in low category, 28% are in high category, and 8% are in very high category.

The results of effectiveness analysis indicate that the implementation of the program is not effective to improve the competence of teachers or the target achievement of teachers' ability is not achieved. The constraints faced during the implementation of this program are the limited number of facilitators, less supportive facilities and infrastructure and the readiness to attend the training and the age of the participants.

## 5.0 Conclusion

Dual Expertise Program for Package Expertise Program Computer Engineering and Networking was not effective. The competency of participant is dominated in low category. Constraints faced during the implementation of this program are facilitators, facilities and infrastructure, as well as readiness to attend the training and age of participants.

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# Needs Analysis of Students in the Learning of Genetics Subject in Higher Education (Review on Universitas Negeri Makassar)

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## Abstract:

The first step that must be done in conducting the learning design activities is to analyze learning needs. This study aims to explore information about the needs of students in genetic learning, which is based on problems encountered in lectures. Subjects in this study were students of Biology Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar who have programmed genetic subjects as many as 30 people. This research is qualitative research with Focus Group Discussion (FGD) method. The results show that there are some problems in learning, including the taught material and learning model that has been done. Especially in the material that has been given, there are three main problems, namely the amount of material that is quite a lot, the material is still classified abstract so difficult to understand, and the number of scientific terms used that are considered difficult by most students. As for the learning model, the main problem found that cooperative learning model used is not effective enough. This is marked by a growing discussion that tends to be out of focus so that students cannot yet generate conclusions. Also, the impact of the application of the learning model causes the scope of the planned material to be completely incomplete. Conclusions from the results of this study provide a description that the need for planning in learning through the development of learning models in the future.

**Keywords:** Analysis of learning needs, Genetics, Learning Model

## 1.0 Introduction

The role of education is significant in many aspects of life. The importance of education can form the fundamental skills, both intellectually and emotionally to improve the quality of a nation. As already summarized nationally through RI Law no. 20 of 2003 on National Education System: "Education is a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have religious, spiritual power, self-control, personality, intelligence, noble character, and the necessary skills himself, society, nation, and state." At the university level is emphasized through the vision of Higher Education, which is "The realization of a system of higher education that produces people of character, intelligence, and skill to build a dignified and competitive Indonesia nation through the development of science, technology, and art for the progress and sustainable human welfare." Thus the learning atmosphere and learning process needs to be maximized.

To realize the learning atmosphere and the maximum learning process, especially within the scope of universities can be through the application of various models of learning. One of the most widely used learning models is cooperative learning model. According to

Trianto, (2009), this model has proven able to cultivate an enthusiastic attitude and curiosity about what they are learning. It happens because, in cooperative learning, students work together to solve complex problems.

One of the courses that study the fundamental life is Genetics. This course is one of the compulsory courses in several departments of biology that exist in universities in Indonesia and the world. Especially in the Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, this course has three credits with duration of 3 hours of the lesson each meeting, i.e., two sessions for theory and a meeting for the laboratory.

Based on the preliminary observations, indicating that genetics is one of the interesting subjects to be studied because it is directly related to living things. But among some materials, the karyotype is a material that is felt quite difficult to understand, because the content explains the grouping of chromosomes by type and size. In karyotip consists of grouping the types of maternal chromosomes and paternal chromosomes. In addition to the two large groups, there are also groups of chromosome pairs that include the autosomal chromosome and the genital chromosome. The material is essential because it is the initial material that must be understood by the students before studying genetics further. However, most students still have difficulty in reviewing it, because the content presented tends to be abstract. The reality implies that the cognitive abilities of the students have not been trained optimally. Cognitive skills can be obtained through several factors, including the understanding of the utilization of knowledge, which later can be applied in everyday life for personal interests, for others and the environment.

As the importance of Genetics is to be studied, Dobzhansky states in Ayala & McDonald, (1984); Klymkowsky, (2010) that "Nothing in biology is understandable except the light of genetics. Genetics is the core biological science ". It can be interpreted that Genetics as the basis for the understanding and development of biological sciences or other sciences related to biology. Therefore, this study was conducted to explore information about the needs of students in genetic learning based on the problems encountered in the lecture.

## **2.0 Research Method**

### **2.1 Types of research**

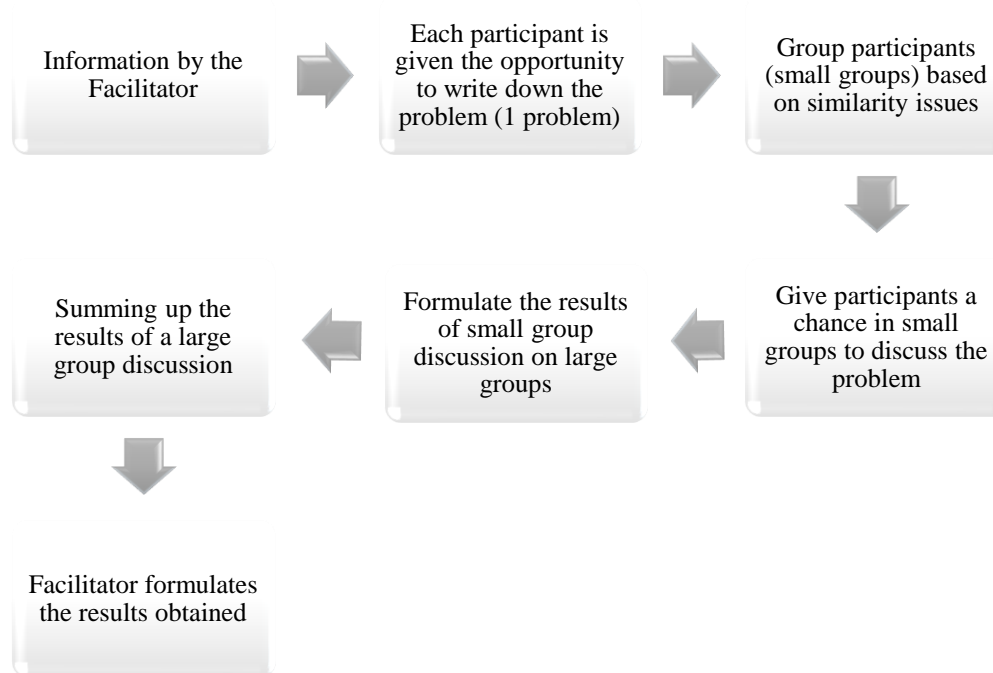
This research is qualitative research that aims to explore something that is considered related to social problems, such as problems in learning in the classroom. This study is a case study, conducted only on the Genetics course.

### **2.2 Population and Sample**

The population in the study includes all students who are active in the Department of Biology, Faculty of Mathematics and Natural Sciences, State Universitas Negeri Makassar. Selection of sample is done by purposive sampling, with criterion only student who has followed the genetic course. Samples were selected from the previous three batches, with a sample size of 10 people per randomly selected force.

### 2.3 Research Procedure

This research was conducted using Focus Group Discussion (FGD) method, which involved all samples in a discussion forum. The purpose of discussion to explore information about the implementation of Genetics lectures. The stages of implementation of the activities are presented in Figure 1 below.



**Figure 1:** Stages of research

### 3.0 Result

Based on the results of FGD can be formulated that there are 2 main problems in learning, the material taught and learning model that has been done. The formulation of each problem is described as follows:

#### 3.1 Learning materials

In the material there are 3 problems that the content of the material is complex, the material classified as abstract so difficult to understand, and most students find it difficult to understand and memorize the scientific terms used:

##### i. Complex material

In genetic lectures, it contains a number of materials whose field of study starts from the molecular material to the population. In more detail, genetic material seeks to explain genetic material, genetic expression, and genetic inheritance, as well as the mechanism of inheritance of these traits (meiosis, gametogenesis and Mendel's law). The complexity of the material causes genetic subjects are considered solid and difficult to understand because students receive information in a continuous coherent without reaching a gradual understanding.

ii. Material classified as abstract

Not all the material in genetic learning seems abstract. However, the karyotype material is considered difficult to understand, although it is one of the basic materials that students need to understand in advance before moving on to the next material. This material is the depiction of chromosomes in a cell with various structures of each chromosome. The karyotype shows how many chromosomes are present in the cell with some details of the chromosome structure and the number of chromosomes. Also presents the grouping of chromosomes by type and size. In other words, the outline of the material contains the chromosome complex. All of these things cannot be seen directly as if doing observations on other living things, so students assume that karyotype material is something that is abstract nature. Can be grouped, compiled, calculated and studied, but cannot be seen and touched/touched.

iii. Terms used

In karyotype material, many use scientific terms which, according to the students, are quite difficult to remember. Also, the mention in the use of the term is also still unfamiliar, because the terms used are almost similar to each other. For example, the use of the term haploid-diploid, maternal-paternal-parental, gametogenesis, sex-autosomal chromosomes, homozygous-heterozygous, dominant-recessive, genotypes and others. All of these terms are quite confusing to some students.

### **3.2 Learning model**

The main problem that found that cooperative learning model used is not yet effective enough. It is known from the final achievement of learning can not be achieved entirely. This is due to understand the material in genetic lectures, it takes several stages of activity, one of which is how students can analyze cases together, where the data used comes from participants of the course itself. For example, the student is asked to analyze the inheritance properties of the participants themselves, such as hair type, ear type, dimples, height and others. In the process of finding answers, students often take a while to find the answer, but the answer to that question is not difficult enough.

### **4.0 Discussion**

Based on the results obtained shows that students still have difficulty in understanding the material presented, especially on the initial material, which is karyotype material. This is because in the exposure karyotype material, students difficult to understand the Latin terms in the course of genetics. These terms sound almost identical to each other, whereas they have different meanings. This shows that students' cognitive abilities have not been trained optimally. Similar difficulties in the study of genetics were also experienced by students in other countries as revealed by Haambokoma, (2007), that students are difficult to understand the scientific terms in the matter of genetics.

Genetics is a branch of the science of Biology that studies the inheritance of the nature of living things, its mechanisms, and the material of inheritance (Lewis, 2009; Suryo, 1994). The field of genetic studies starts from the subcellular (molecular) region to the population. In more detail, genetics attempts to explain the information carrier material to be inherited (genetic material), how it is expressed (genetic expression) (Elrod & Stansfield, 2007), and

how it is transferred from one individual to another (genetic inheritance), and the mechanism of inheritance of information itself (meiosis, gametogenesis and Mendel's law).

The development of genetics begins from Mendel, Watson-Crick, molecular genetics, to genetic engineering (Watson, Tooze, & Kurtz, 1988). The rapid development in the field of genetics causes the material that can be collected and the information that can be delivered so varied and dense, that it is known to some genetics based on different perspectives or interests. In addition to Mendel's genetics, modern genetics, plant genetics, molecular genetics, animal genetics, microbial genetics, human genetics (Corebima, 1997).

Therefore, to be able to understand genetics as a whole requires a grouping of concepts. The concept group has a sequence of concepts leading to a basic understanding of inheritance. Genetic material is only distinguished between higher or lower living beings, and molecular genetics. In the material contains many scientific terms. Some terms derived from the beginning and as a basis for building understanding are in karyotype material. The terms are numerous and confusing, so it is not easy to understand if not well studied, especially the terms in karyotype material because they have similarities to each other.

Similarly, the use of terms and problems in the material of inheritance properties, where things are studied as if only concerned with the other parts of the world. This is because most of the literature used comes from books or information from abroad. Also, all the facts and examples of inheritance properties expressed in reading sources contain events occurring abroad, as outlined in his book Campbell, Reece, & Mitchell, (2002); Elrod & Stansfield, (2007). In other words, the lack of a real example fits our life, so students less well understand the exposure of genetics.

In addition, the use of cooperative learning model that has been done still cannot provide effective results in learning. This may be due to the absence of the right type of learning to apply the cooperative learning model. According to Ratna, (2011), actually cooperative learning is not a new learning. This learning takes shelter under constructivism. According Vygotsky that in constructing a concept need to pay attention to the social environment. Meanwhile, according to Trianto, (2009), in cooperative learning learners work together to solve complex problems. This is in line with the opinion of Sani, (2013), that the essence of cooperation in peer groups becomes an important aspect in cooperative learning, so that learning is generally done in groups is an innovative learning.

Therefore, these findings may be used as a reference to develop a cooperative learning model with methods that would improve the ability of students in studying genetic subjects in the future.

## **5.0 Conclusion**

There are three main problems, namely the amount of material that is quite a lot, the material is still classified abstract so difficult to understand, and the number of scientific terms used that are considered difficult by most students. As for the learning model, the main problem found that cooperative learning model used is not effective enough so that a cooperative learning model with another method is needed that would improve the ability of students in studying genetic subjects in the future.

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# **Analysis of Internal and External Factors Supporting The Environmental Quality Improvement of Urban Fringe at Makassar, South Sulawesi, Indonesia**

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## **Abstract:**

The rapid development of Makassar City population triggered the growth of urban fringe as a buffer zone. This area develops uncontrolled so that unstructured city growth occurs. Even in this area also grows slum environment due to building density. This study describes the external and internal factors that support efforts to improve the quality of urban environment fringe in Makassar. This review is a preliminary study on the determination of urban environmental quality improvement strategies. The data collection used is Focus Group Discussion involving 18 community leaders in the urban fringe area. Achieving the results of identification using a qualitative approach. The results of the analysis indicate that the internal factors that become the power of society are the attitude and motivation is still high. Internal weaknesses are environmental knowledge and the availability of cutting-edge technology in the management of its residential environment. External factors that become an opportunity for the development of community participation in environmental control is the regulation of the central government and the government of Makassar. The threat to this program is the growing rate of migration in urban areas,

**Keywords:** Challenge, threat, strength, weakness

## **1.0 Introduction**

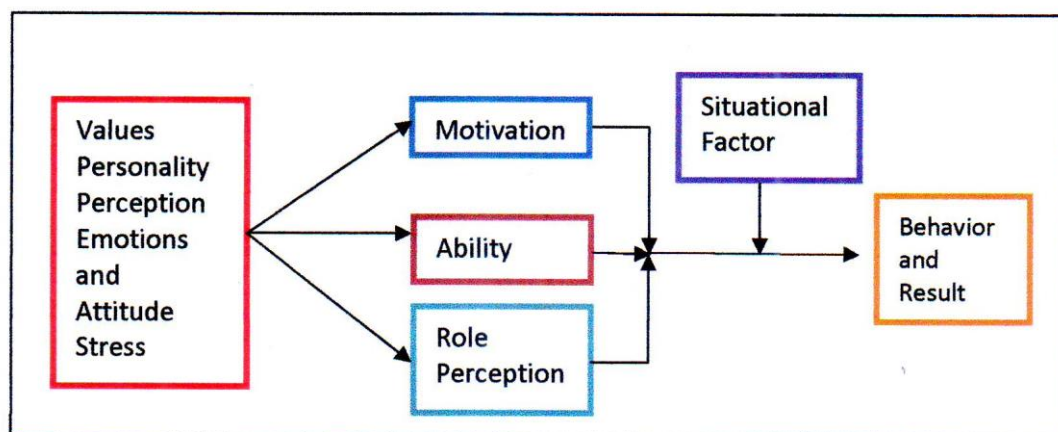
The growth of big cities in Indonesia is strongly influenced by the increasing number of population which consequently to the growth of the controlled area. The phenomenon of urban sprawl has a positive impact, namely to make quality homes at affordable prices for the middle to lower class society. However, this phenomenon can also cause harmful impacts for surrounding communities such as environmental sanitation and slum problems (Yeh & Li, 2001). Many urban problems have emerged recently due to the expansion of the out-of-town area.(Hilman, 2005)

The population development of Makassar was also characterized by the growth of low-income migrants. They live on the outskirts of Makassar City with relatively low occupancy quality. Slum condition is an indicator of the decrease in environmental carrying capacity due to population pressure. This condition is exacerbated by the behavior of people who throw garbage carelessly. This behavior has an impact on the quality of the residential environment. Population data in Makassar shows that in 2016 1,469,601 people consisted of 727,314 male and 742,287 female residents. Compared to the population of 2015, the population of Makassar City experienced a growth of 1.39 percent. Meanwhile, the gender ratio of male population to female population is 98. The population density in Makassar City in 2016 reached 8,361 people / km<sup>2</sup> with the average of population per household of four people. Population density in 15 sub-districts is quite diverse with the highest population density

located in Makassar District with a density of 33,634 inhabitants/km<sup>2</sup> and the lowest in Tamalanrea Sub-district of 3,523 persons /km<sup>2</sup>.

The environmental quality cannot be separated from the rapid growth rate of the population either because of the population growth factor itself naturally and because of urbanization (Pebley, 1998). This review is a preliminary study for the development of community participation towards the improvement of the quality of the residential environment.

The study on the development of community participation begins with the theory of social psychology. Participation is identical with behavior which defines as the process of interaction between personality and environment. Human behavior arises with the stimulus which is then responded in response form. Behavior is determined by perception and personality, while perception and personality are based on the experience. The process of the formation of a person's behavior begins in the cognitive domain or first given a stimulus of knowledge to stimulate the response in the form of a person's attitude towards a known object. The further stimulus of the object causes a further response. The form of action means someone can act or behave by knowing in advance the meaning of stimulus received, in other words, a person can behave continuously to the environment where an individual is a form of psychological response both internal and external to the environment. Individual behavior as MARS Model is described in figure 1. (McShane & Von Glinow, 2013)



**Figure 1 :** Individual Behavior as a MARS Model

## 2.0 Research Method

This research is a qualitative study and documentation study on the characteristics of low-income migrants living in suburbs of Makassar City to improve the quality of its residential environment. The data collection used is Focus Group Discussion involving 18 community leaders in the fringe urban area. Achieving the results of identification using a qualitative approach.

## 3.0 Result and Discussion

The result of the study on the problems of marginalized communities is the desire to feel comfortable environment or settlement with the support of good environmental quality. The general public tends to realize that with a right neighborhood environment will affect the



quality of social harmony. Factually, sanitation conditions in poor settlements such as puddles scattered rubbish and non-functioning sewers. The community understands this condition as a cause of bacterial disease developments. Thus, the attitude to have a healthy environment is owned by the community. The establishment of a very enthusiastic attitude from the people who live on the outskirts of Makassar supports government efforts or programs regarding efforts to improve the quality of the residential environment.

The second finding is that the general public does not understand the practical knowledge of creating a right settlement environment. The presumption that a healthy environment can only be formed with adequate building facilities. Various practical methods of environmental sanitation management such as making absorption wells, composter making or waste segregation activities are not understood by the community. Communities tend to wait for the facilities of the municipality to improve the environment.

Externally or opportunities that can support the behavior of rural communities is by government policy approach. Nationally, the government has issued regulations on environmental protection. In Law No. 32 of 2009 on Protection and Environmental Management stipulated that the government organize spatial arrangements for the most significant prosperity of the people. The regulation stipulates that everyone is a part of society and society has equal rights, obligations, roles and participation in environmental management.

The second regulation is Law No.18 Year 2008 on Waste Management; this regulation explains that local government is responsible for ensuring proper and environmentally sound waste management. Furthermore, the government is also obliged to grow and increase public awareness in waste management. The Government seeks to facilitate the community to be involved in reducing, handling, and utilizing waste, and implementing waste management and facilitating the provision of waste management infrastructure and facilities;

The third regulation is the Regulation of the Minister of Environment No. 5 of 2014 on the Standard of Wastewater Quality. This regulation aims to provide local government direction to be able to control household waste so as not to pollute water bodies such as rivers or waters.

The fourth regulation is the Makassar City Regional Regulation No.4 Year 2011 on Waste Management, the Government of Makassar City is responsible for raising public awareness on environmental quality and encouraging community activities to utilize waste as a resource. In this regulation, the local government is tasked with developing domestic wastewater infrastructure and facilities and conducting education, counseling and socialization and guidance to foster community awareness;

The next fact related to the uncontrolled expansion of residential areas is the development of slums. The picture of suburban areas of Makassar appears to occur in the slums of Tamalate, Manggala, and Biringkanaya sub-districts, with the number of territories, heads of households, and population, can be seen in Table 1 below.

**Table 1:** Slum conditions in Urban Fringe (2017)

<b>Kecamatan Subdistricts</b>	<b>Area (Km<sup>2</sup>)</b>	<b>Number of households</b>	<b>Population Number</b>	<b>Population Density Per Sq.Km (Jiwa/Km<sup>2</sup>)</b>	<b>Density Per Sq.Km (House/Km<sup>2</sup>)</b>
Tamalate	20,21	49.425	194.493	9.623,6	2.445,57
Manggala	24,14	31.392	138.659	5.743,95	13.005,47
Biringkanaya	48,22	49.059	202.520	4.199,92	1.017,4

Based on Ministerial Regulation No. 11/2008 concerning Guidance on Harmonies of Housing and Settlement Regions, it is stipulated that local zones with density standards, ranging from 51 to 100 persons/ha and the number of houses at most 25 units / ha. However, the facts in Table 1 above for Tamalate and Biringkanaya sub-districts are still in a safe position, while Manggala sub-district has experienced an overload of 105 houses / ha. Furthermore Ministerial Regulation No. 11 of 2008 allows for more comfortable occupancy and avoid all kinds of risks such as fires that in 2016 the number of fires in 3 Sub-districts reached 14 events, with details as in Table 2 below.

**Table 2 :** Fire Incidence at Urban Fringe in Makassar, (2016)

<b>Subdistricts</b>	<b>Causal Factor Of Fire</b>							<b>Jumlah Total</b>
	<b>Electric</b>	<b>Oil Stove</b>	<b>Gas Stove</b>	<b>Oil Lamp</b>	<b>Wax</b>	<b>Rubbish</b>	<b>Others</b>	
Tamalate	3	2	-	-	-	4	3	12
Manggala	5	-	2	-	-	2	3	12
Biringkanaya	1	-	1	-	1	4	5	12

Meanwhile, the requirement for representative environmental atmosphere should be supported by the fulfillment of Green Open Space. For an illustration, the green open space in Makassar City in urban fringe shows in Table 3. The data shows that Manggala and Tamalate sub-districts still have a considerable extent of green space presentations, while the Biringkanaya sub-district is only 19.14% of their sub-districts. The regulation of green open space requirement is Law Number 26 the Year 2007. The article 29 Paragraph 2 requires that the urban areas should contain 30% of the green open space. Furthermore, Paragraph 3 requires that the areas should have 20% of the Green Open Space for Public.

**Table 3:** Green Open Space in Urban Fringe (2017)

<b>No.</b>	<b>Subdistrict</b>	<b>Area (Km<sup>2</sup>)</b>	<b>Green Open House Area (Km<sup>2</sup>)</b>	<b>Percentage (%)</b>
1	Tamalate	20,21	6,24	30,88
2	Manggala	24,14	12,85	53,23
3	Biringkanaya	48,22	9,23	19,14

The threat of the environmental quality improvement program in urban fringe is the high rate of migration in urban population. Based on data from the Office of Population and

Civil Registration of Makassar City, the growth rate of migration to Makassar City reaches about 100,000 people per year. This factor is number one regarding population growth of Makassar City compared to birth and death factors. Demographic facts are also characterized by high density of buildings making it difficult to provide infrastructures such as green open spaces and open channels.

#### **4.0 Conclusion**

From the results of the discussion above, then this article concludes that the internal factors that become the power of society in urban fringe are the attitude and motivation is still high. Internal weakness is the lack of environmental knowledge so that people do not practice protection. External factors that become an opportunity for the development of community participation in environmental control is the existence of government rules in the form of Laws, Ministerial Regulations, and Regional Regulations of Makassar City. The threat to this program is the growing rate of migration in urban areas.

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# Identification of Potential Water Quality in Jeneberang River South Sulawesi Indonesia

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## Abstract:

Jeneberang River is a river that flows several cities in South Sulawesi. This river is also a water producer for Makassar city. However, the quality of this river water decreases due to human activities. This study describes the quality of water in the upstream, middle and downstream areas. The results of the study indicate that the Jeneberang River belongs to the category of mild contamination. Although in some rivers there are meet the quality standards. Pollution contents at downstream are higher than the water samples of the middle and upstream areas. Therefore, the quality of river water must be maintained through the program of guidance and socialization to people living around the river in order not to dispose of garbage, pesticides, and other wastes into the river so that water quality can meet the required water quality standards.

**Keywords:** water quality, physics, organic and microbiological.

## 1.0 Introduction

A river is a water-drainage flow in the form of a natural network that begins from upstream to downstream. The river serves to drain water and as natural drainage so that the quality is highly dependent on community activities in water catchment areas. Along with the increasing population of activity, the burden on the environment such as the decrease in environmental carrying capacity is also higher (As-Syakur *et al.*, 2010) (Samudro, Agustiningsih, & Sasongko, 2012)

The decrease in the quality and carrying capacity of the river appears on the physical appearance of turbid water and the pile of garbage sediments. This is because of the river as the final media of waste disposal from all human activities. With the increasing number of activities or small industries and the development of production in some activities or industries in South Sulawesi Province will undoubtedly be at risk to the decrease of the river carrying capacity.

Rivers have dynamic properties, so in the utilization of their potential can reduce the value of river benefits and endanger the environment widely. The flood disaster caused by the narrowing of the river basin due to the intervention of illegal settlements, garbage disposal, and sediment buildup. Pollution due to the disposal of domestic, industrial and agricultural wastewater causes a decline in environmental carrying capacity. As an example to maintain water quality, it is necessary to monitor or identify the water quality (Pertiwi, 2011)

The Jeneberang River is the main river in the Jeneberang River Basin (DAS) on the southern arm of the island of Sulawesi precisely on the western slopes of the mountains of

Lompobattang Mount, a volcano of stratovolcano type that has been rested, the type having relatively un-compact rock structure. At the top of this sizeable volcanic crater remains unrecognizable. The geological condition of the Jeneberang River watershed is dominated by alluvium deposits of rivers, lakes and beaches along streams downstream. While the existing type of rock is the composition of Camba Formation including marine sedimentary rocks and volcanoes in the form of breccia, lava, tuff, and conglongmerat and Lompobattang Formation at the upstream of the river.

Jeneberang River is located in the area of South Sulawesi Province, Indonesia. Geographically the Jeneberang River Basin lies at  $119^{\circ} 23' 50''$  BT -  $119^{\circ} 56' 10''$  BT and  $05^{\circ} 10' 00''$  LS -  $05^{\circ} 26' 00''$  LS. Jeneberang River has a length of between 75-80 Km flows from east to west from Mount Bawakaraeng and Mount Lompobattang to the Makassar Strait. Jeneberang River Basin is crossing eight districts, and one city spread in South Sulawesi Province. Upstream of Jeneberang River has a high sedimentation rate of post-landslide Bawakaraeng Mount caldera in 2004.

In Jeneberang River flow there is a dam, Bili-Bili Dams located in the Village Bili-Bili Bontomarannu Sub District, Gowa District. This dam is one of the dams that control the flood of Jeneberang River that can provide raw water of 3300 liters / s with the area of irrigation 24,585 Ha. The dam also has hydroelectric power (PLTA) with an installed capacity of 20.1 MW. Dams Bili-bili is the largest dam in South Sulawesi. The dam was inaugurated by President Megawati Soekarnoputri in 1999. The dam with an area of 40,428 hectares of the reservoir was built with a foreign loan of Rp 780 billion in cooperation with Japan International Cooperation Agency (JICA).

## 2.0 Theoretical Review

The location of the water sampling is determined in such a way as to know the natural water quality and water quality changes caused by human activities. Natural water quality is measured at upstream locations that have not been significantly altered by human activities. While changes in water quality can be known downstream of the river, after going through a settlement, industrial or agricultural areas. For the protection of users of water sources, also the location of measurement at each utilization of water sources such as drinking water source, industry, fishery, recreation and others. In the estuary area of the river is also a measurement location to determine the effect of seawater intrusion. In lakes or reservoirs, at least three sampling points are required before entering, in the middle and after leaving the river.

Determination of monitored parameters to determine the quality of water at 27 Rivers and two lakes targeted for water quality monitoring of South Sulawesi Province. The parameters to be analyzed are: DO, BOD, COD, NO<sub>2</sub>, NO<sub>3</sub>, NH<sub>3</sub>, Total Phosphate, SO<sub>4</sub>, Phenol, Oil and Fat, Fecal Coli and Total Coli. While the metallic parameters are also analyzed to see whether or not substantial metal polluter on the river since the river is partly used by the community in daily activities. (Effendi, 2003)

The sampling method used is the quick method (grab sample), i.e. the sample represents the place at a particular moment (then). Thus, the measurements show the water quality at the time of sampling. At the sampling site, recording location conditions and field parameters on field note sheets. Some things monitored include water color, weather conditions, whether or not garbage at the time of sampling. For field parameters, measured

pH, water temperature, and dissolved oxygen analysis at zero days, the location was also preserved using  $\text{HN03}$  and  $\text{H2SO4}$ .

The positioning of sampling is required a GPS device (Geographical Positional System) to facilitate the taking of the next test samples with different personnel. Documentation tools such as cameras, camcorders are also indispensable for recording field conditions and situations and as evidence of sampling.

### 3.0 Research Method

This study is experimental research conducted on water samples in Sungai Jeneberang. The test sample came from three locations: Tinggi Moncong Subdistrict for the upstream area, Parangloe Subdistrict for the middle area and Pallangga Subdistrict for the downstream area. Water quality testing conducted at the Laboratory of Environment Management Department of South Sulawesi Province. Water quality assessment method refers to Government Regulation No. 82 of 2001 on Water Quality Control and Water Pollution Control, and South Sulawesi Governor's Regulation no. 69 of 2010 on the Quality Standard and Criteria of Environmental Damage.

### 4.0 Results of Water Sampling in the upstream area

The upstream water sampling was conducted in Kecamatan Tinggi Moncong located at 05'15'00 'LS - 119'55'00' east longitude. Water quality testing results in upstream areas are presented in Table 1

**Table 1:** Water quality test results of upstream areas

No	Unit	Unit	Water quality	Quality standards (class I)	Quality standards (class II)	Method
(1)	(2)	(3)	(4)	(7)	(8)	(9)
<b>Physics</b>						
1	Temperature	$^{\circ}\text{C}$	26	Deviasi 3	Deviasi 3	SNI 06-6989-23-2005
2	TSS	mg/L	<b>135</b>	50	50	SNI 06-6989-3-2004
3	TDS	mg/L	24	800	1000	APHA, Section 5210C 2005
4	DHL	$\mu\text{S/cm}$	33	-	-	SNI 06-6989-1-2004
<b>Organic</b>						
1	pH***	-	7,91	6,0 - 8,5	6,0 - 8,5	SNI 06-6989.11-2004
2	DO	mg/L	6,3	6	4	SNI 06-6989.14-2004
3	BOD	mg/L	2,9	2	3	SNI 6989.72.2009
4	COD	mg/L	21,4	10	25	SNI 6989.73.2009

No	Unit	Unit	Water quality	Quality standards (class I)	Quality standards (class II)	Method
5	Klorida	mg/L	1,0	600	-	SNI 6989.19.2009
6	Posfat (PO <sub>4</sub> )	mg/L	0,05	0,2	0,2	SNI 06-6989.31-2005
7	Nitrat (NO <sub>3</sub> )**	mg/L	0,7	10	10	SN 06-2480-1991
8	Nitrit (NO <sub>2</sub> )	mg/L	0,003	0,06	0,06	SNI 06-6989.9-2004
9	Amonia(NH <sub>3</sub> )	mg/L	0,04	0,5	-	SNI 06-6989-30-2005
10	Oil and Fat	µg/L	<2000	1000	1000	JIS K 0102-24
<b>LOGAM</b>						
1	Seng (Zn)	mg/L	<0,02	0,05	0,05	SNI 6989.7-2009
2	Besi (Fe)	mg/L	<0,03	0,3	-	SNI 6989.4-2009
3	Mangan (Mn)	mg/L	<0,02	0,1	-	SNI 6989.5-2009
4	Timbal (Pb)	mg/L	<0,076	0,03	0,03	SNI 6989.8-2009
<b>Microbiology</b>						
1	Total Coliform	jlm/1000ml	200	100	1000	Standar Method
2	Fecal Coliform	jlm/1000ml	350	1000	5000	Standar Method

Water quality test results indicate that microbiological parameters that do not meet the requirements of total Coliform. Unqualified organic chemical parameters are DO and COD values. This indicates that the organic contamination found in the water flow is considerable. Water quality test results in the middle area are presented in table 2.

Water quality test results indicate that microbiological parameters that do not meet the requirements of total Coliform. Unqualified organic chemical parameters are DO, BOD and COD. This indicates that the organic contamination found in the water flow is considerable.

**Table 2** : Water quality of Middle Area test results

No	Unit	Unit	Water quality	Quality standards (class I)	Quality standards (class II)	Method
(1)	(2)	(3)	(5)	(7)	(8)	(9)
<b>Physics</b>						
1	Temperature	°C	26	Deviasi 3	Deviasi 3	SNI 06-6989-23-2005
2	TSS	mg/L	14	50	50	SNI 06-6989-3-2004
3	TDS	mg/L	58	800	1000	APHA, Section 5210C 2005
4	DHL	µS/cm	69	-	-	SNI 06-6989-1-2004

Organic						
1	pH***	-	7,68	6,0 - 8,5	6,0 - 8,5	SNI 06-6989.11-2004
2	DO	mg/L	6,7	6	4	SNI 06-6989.14-2004
3	BOD	mg/L	2,4	2	3	SNI 6989.72.2009
4	COD	mg/L	13	10	25	SNI 6989.73.2009
5	Klorida	mg/L	<0,8	600	-	SNI 6989.19.2009
6	Posfat (PO <sub>4</sub> )	mg/L	0,09	0,2	0,2	SNI 06-6989.31-2005
7	Nitrat (NO <sub>3</sub> )**	mg/L	0,9	10	10	SN 06-2480-1991
8	Nitrit (NO <sub>2</sub> )	mg/L	0,014	0,06	0,06	SNI 06-6989.9-2004
9	Amonia(NH <sub>3</sub> )	mg/L	0,05	0,5	-	SNI 06-6989-30-2005
10	Oil and Fat	µg/L	<2000	1000	1000	JIS K 0102-24
LOGAM						
1	Seng (Zn)	mg/L	<0,02	0,05	0,05	SNI 6989.7-2009
2	Besi (Fe)	mg/L	0,07	0,3	-	SNI 6989.4-2009
3	Mangan (Mn)	mg/L	<0,02	0,1	-	SNI 6989.5-2009
4	Timbal (Pb)	mg/L	0,08	0,03	0,03	SNI 6989.8-2009
Microbiology						
1	Total Coliform	jumlah/1000ml	430	100	1000	Standar Method
2	Fecal Coliform	jumlah/1000ml	750	1000	5000	Standar Method

Furthermore, the results of water quality checks on downstream areas are presented in table 3.

**Table 3 : Quality of Jeneberang River Water Downstream**

No	Unit	Unit	Water quality	Quality standards (class I)	Quality standards (class II)	Method
(1)	(2)	(3)	(6)	(7)	(8)	(9)
Physics						
1	Temperature	°C	26	Deviasi 3	Deviasi 3	SNI 06-6989-23-2005
2	TSS	mg/L	161	50	50	SNI 06-6989-3-2004
3	TDS	mg/L	66	800	1000	APHA, Section 5210C 2005
4	DHL	µS/cm	92	-	-	SNI 06-6989-1-2004
Organic						
1	pH***	-	7,60	6,0 - 8,5	6,0 - 8,5	SNI 06-6989.11-2004
2	DO	mg/L	7,0	6	4	SNI 06-6989.14-2004
3	BOD	mg/L	2,1	2	3	SNI 6989.72.2009
4	COD	mg/L	13,2	10	25	SNI 6989.73.2009
5	Klorida	mg/L	1,5	600	-	SNI 6989.19.2009
6	Posfat (PO <sub>4</sub> )	mg/L	0,4	0,2	0,2	SNI 06-6989.31-



2005						
7	Nitrat (NO <sub>3</sub> )**	mg/L	1,3	10	10	SN 06-2480-1991
8	Nitrit (NO <sub>2</sub> )	mg/L	0,034	0,06	0,06	SNI 06-6989.9-2004
9	Amonia(NH <sub>3</sub> )	mg/L	0,09	0,5	-	SNI 06-6989-30-2005
10	Oil and Fat	µg/L	<2000	1000	1000	JIS K 0102-24
<b>LOGAM</b>						
1	Seng (Zn)	mg/L	<0,02	0,05	0,05	SNI 6989.7-2009
2	Besi (Fe)	mg/L	0,08	0,3	-	SNI 6989.4-2009
3	Mangan (Mn)	mg/L	<0,02	0,1	-	SNI 6989.5-2009
4	Timbal (Pb)	mg/L	0,11	0,03	0,03	SNI 6989.8-2009
<b>Microbiology</b>						
1	Total Coliform	jlm/1000ml	1500	100	1000	Standar Method
2	Fecal Coliform	jlm/1000ml	4600	1000	5000	Standar Method

The results of the water quality testing downstream area are quite worrying that the microbiological parameters (total coliform and fecal coliform) more that do not meet the requirements of the total Coliform. Also there are also organic chemical parameters that do not meet the requirements of DO, BOD, and COD. The results of water quality analysis on the downstream area showed an increase in pollution in the downstream area. This is due to human activity in the watershed.

The concentration of organic content in water is characterized by high BOD value. This shows that the activity of drainage of organic waste from settlements around the river increases. (Yudo, 2011)

## 5.0 Conclusion

Based on the analysis of water quality status on Jeneberang River is classified as mild contamination. Although in some rivers there are meet the quality standards. Pollution contents at downstream is higher than the water samples of the middle and upstream areas. By him, the quality of river water must be maintained through the program of guidance and socialization to people living around the river in order not to dispose of garbage, pesticides and other wastes into the river so that water quality can meet the required water quality standards.

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# Implementation of Adiwiyata Policy in Elementary School as Environmental Education

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## Abstract:

The implementation of the Adiwiyata program is part of the application of environmental education in schools by developing access to information, access to participation, and access to justice in all elements of the school. This study aims to describe the implementation of Adiwiyata program in five elementary schools in Makassar. Data collection techniques through observation and documentation. The results showed that the implementation of the adiwiyata program is divided into four programs: Environmental awareness policy, implementation of environment-based curriculum, participatory based environmental activities and the provision of supporting facilities and infrastructure. This activity takes place with the commitment of principals and teachers in developing students' behavioral behavior and involving students in creating a healthy and clean school environment.

**Keywords:** Program, School, and Environmental Behavior.

## 1.0 Introduction

Environmental education was held as part of environmental quality protection efforts through the provision of knowledge to individuals about environmental issues. Environmental education not only provides knowledge about the environment but also raises awareness of the environment and concerns with environmental conditions. (Pooley & O'Connor, 2000). Environmental education as the effort to rise the individuals ability and to understand the importance of the environment. The students knows the concept of environmental interrelationship with economic, social, cultural and developmental issues. The development of educational policy is based on the theory that environmental education can change students' behavior if the material of learning contains concepts of the ecological meaning of the environment and its relation to human life.

Environmental education policies in schools contain a curriculum that covers material on broader environmental issues that can educate skilled learners in analyzing environmental issues and conduct investigations and allow time to apply their skills.(Stapp, 1969).

Environmental education is a process for recognizing values and explaining concepts to develop the skills, attitudes necessary to understand and appreciate the mutual relationships between people, cultures, and biophysical environments. The educational process aims to create a world community that has an awareness of the environment and related issues in it and has the knowledge, motivation, commitment and skills to work, both individually and collectively in finding alternatives or providing solutions to environmental issues there is now and to avoid the emergence of new environmental problems.

The policy of environmental education in Indonesia is declared by a program of the adiwiyata program. This program is based on the mandate of Law No 32 of 2009 on the Protection and Management of the Environment. Specifically article 65 point 2 states that

everyone is entitled to an environmental education, access to information, access to participation, and access to justice in fulfilling the right to a tasty and healthy environment. As a follow-up, the government issued the Regulation of the Minister of Environment No. 02 of 2009 on The Guidance Of The Implementation Of The Adiwiyata Program and updated by Minister of Environment Regulation no. 05 of 2013 on Guidelines For The Implementation of The Adiwiyata Program.

The essence of environmental education through adiwiyata school is the involvement of students in the activities of protection and management of the planned environment is Participatory means students are directly involved in maintaining the environment. For example the division of class cleanliness tasks, Friday clean, the maintenance of the class garden, and race cleanliness classes. For the use of land and school, facilities are the planting of family medicinal plants, making school forests, nurseries, making a fish pond and waste management. The development of extracurricular activities in the effort of environmental protection and management that is composting, making biopori, organic farming, and biogas. For the development of creativity and innovation of school residents such as recycling of waste, utilization and water management, energy saving.

Based on the above description, the adiwiyata program in schools is expected to have a positive impact on improving students' knowledge in maintaining the environment in elementary school.

## **2.0 Literature Review**

Adiwiyata word comes from the Sansakerta language is *adi* and *wiyata*, *adi* has great meaning, great, good, ideal, or perfect. *Wiyata* has to mean as a place where one gets knowledge, norm, and ethics in social life. So adiwiyata is a good and ideal place where can be obtained all the science and various norms and ethics that can be the basis of humankind towards the creation of the welfare of our lives and toward the ideals of sustainable development. (Yusnidar, Liesnoor, & Banowati, 2015).

The adiwiyata program aims to establish a caring and sensitive school community environment. This program develops student participation in environmental conservation and prepares future generations that can engage in sustainable development. Also, the program has a special purpose of realizing responsible schoolchildren in environmental protection and management efforts. This objective can be accomplished with the support of good school governance and teachers' ability to develop students' motivation to engage in environmental stewardship.

Asaad *et al.* (2011) suggest the Adiwiyata Program on indicators and criteria of activities, namely: a) development of environmental and caring environmental policies, b) development of environment-based curriculum, c) development of participatory activities, and d) management and development of school support facilities.

## **3.0 Research Method**

This study is a qualitative study with interviews and documentation as a means of data collection. This study was conducted on five elementary schools in Makassar City which have been developing Adiwiyata Program for five years. Interviews were conducted on the principal element and five teachers per school.

## 4.0 Result and Discussion

### 4.1 Development of Environmental-Based School Policy

The increasing of caring and cultured school environment, the school policy began to analyze the fundamental principles of the adiwiyata program. The results of observations at five adiwiyata schools in Makassar City indicated that environment-based policies are divided into three parts (table 1)

**Table 1:** Environmental-based school policies

Program	Component of program
vision and mission	Environmental Conservation Pollution prevention
curriculum structure	Environmental damage prevention Preservation of environmental functions, Prevention the occurrence of contamination,
Budgeting	Prevention environmental damage provision of facilities and infrastructure of environmental improvement

### 4.2 Development of Environment-Based Curriculum

The delivery of life environment materials to students can be done through an integrated or monolithic curriculum. The development of varied materials, models, learning and learning methods, is conducted to provide students with an understanding of the environment that is hurt by daily environmental issues or local issues.

The result of observation at five elementary schools in Makassar City that run adiwiyata program shows that the application of environmental education accurate with the integrated method. Some subjects are required to submit materials by the structure of the 2013 curriculum (table 2)

**Table 2 :** The integration of environmental education in the subject

Subject	Material	The Purpose of Integration of Environmental Education
Religious education	Al Qur'an	Students recognize Allah's creation from various verses of the Qur'an and are responsible for maintaining their quality
	Theology	Students have an environmental attitude based on faith in God Students have environmental behavior and ethics
	Moral	Students show the ethics and environmental behavior
Indonesian language	Environmental Theme	Students Know the environment through poetry and prose
	Educational Theme	Students prepare a speech script

Citizenship	Country Integrity	with environmental material Student understand the environmental issues occurring within the territory of the Republic of Indonesia
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Development of curriculum conducted in five elementary schools in Makassar City by developing learning models that interest students' learning. The teacher inserts environmental material by utilizing various learning resources so that the learning strategy is more varied than conventional learning model.

### 4.3 Development of Environment-Based Activities

Many school activities were held to increase the caring, and sensitive school environment aims to involve learners in maintaining the quality of the school environment. Activities undertaken by schools as environmental-based activities are presented in table 3.

**Table 3 : School Activities**

School Programs	Activities
Extracurricular	Planting hydroponics plants in schools Cleanest class contest Composing contest with the theme of beautiful and comfortable environment Outbound
Empowerment of Society	Students visit the farm area Students visit the paddy fields Students visit the industrial area

Extracurricular activities aim to provide opportunities for students in developing their creativity and social potential. This acts as a supporting tool for the learning process carried out in schools and became a media application theory for students. Moreover, practices that have been obtained as a tangible result of the learning process of various activities and activities of environmental learning.

Outbound programs provide students with opportunities to study outside the classroom. Outdoor learning experience improves students' learning motivation. In addition to knowledge development, the program also develops psychomotor students because of physical activity. This activity takes the form of recreation at tourist sites or camping at a campground. As part of character formation, open-ended activities have a role in the process of character building for students. Participants follow various challenges so that their creativity and the soul of the evacuation develops. (Hattie, Marsh, Neill, & Richards, 1997; Sudarsana, 2018).

### 4.4 Management and Development of School Support Facilities

In realizing a caring and sensitive school environment needs to be supported by facilities and infrastructures that reflect environmental management efforts. Facilities and facilities include 1) development of existing school support facilities for environmental education; 2) improving the quality of environmental management within and outside the school area; 3) saving natural resources (electricity and water); 4) improvement of food services healthy, and 5) development of waste management system.

The results of the study on the development of environmental caring culture in schools outline seven concrete steps in the application of adiwiyata namely: 1. Improve school environment, 2. Reduce waste and waste, 3. Reduce energy and water use, 4. Find efficient ways to travel to and from school, 5. Promote healthy lifestyle, 6. Encourage active citizenship, 7. Build strong partnerships with various community groups (Desfandi, 2015).

Furthermore, the impact of the implementation of the adiwiyata program in schools is as an activity of forming environmental ethics on the generations. School caring and cultured environments is a gateway for students in shaping ethical behavior towards the environment. The planting of environmental ethics in the school environment in a sustainable manner is expected to be firmly embedded in the hearts of the students so that it will bear fruitful behaviors that love nature and its contents.

## 5.0 Conclusion

Implementation of the adiwiyata program in elementary school as an effort of environmental education through school policy and integration of environmental material in subjects. Also, the program also develops based environmental activities with the aim of involving learners to participate in maintaining the school environment. This program also takes place with the availability of school facilities and infrastructure.

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# **Framework of Anti Corruption Learning Model Using Media for Senior High School Students**

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## **Abstract:**

This paper aims to describe the framework of developing a media-based anticorruption learning model of cards for junior high school (SMP). This type of research is a descriptive study that examines the stages of the development of anti-corruption learning model based on card media. The type of data used is secondary data derived from the review of various sources on the development of learning models. The framework describes the sequence of activities that should be done systematically in model development.

**Keywords:** Development, product and conceptual

## **1.0 Introduction**

Anti-corruption education is a global phenomenon that has been widely applied in most countries in the world, ranging from continental Europe, America, Asia, Australia, and even Africa has implemented the practice of anti-corruption education. (Spector, 2005). Learning from the experience of other countries shows that the eradication of corruption is not enough just to do law enforcement, but must be followed by the application of anti-corruption education. One example of a country that has implemented anti-corruption education is the Republic of China. As reported by Jawa Pos on July 30, 2005, in China online it was written that all students in elementary education level are given anti-corruption education subject. The goal is to provide "vaccines" to students of the dangers of corruption. While the long-term goal of the program is the young generation of China can protect themselves amid the onslaught of corruption crime. Formal education in cases of corruption eradication is not new; it has a strategic position. In line with the view of progressivism, the school is seen as an agent of social change in charge of introducing new values to the community. (Komalasari & Saripudin, 2015).

In Indonesia, the term anti-corruption education is relatively new because not many people know and apply it. In Law No. 20 of 2003 on the National Education System, especially in the national curriculum section, the term anti-corruption education is explicitly not mentioned, either at the primary school level to university level. Therefore, anti-corruption education can be viewed as educational innovation. According to Darma (2003), in general, the objectives of anti-corruption education are (1) the formation of knowledge and understanding of the forms of corruption and its aspects; (2) changing perceptions and attitudes toward corruption; and (3) the formation of new skills and skills alleged to fight corruption. Furthermore, Kesuma (2004) added that its long-term benefits might contribute to the sustainability of the National Integration System and anti-corruption program. While for the short term is the development of political will of the Indonesian nation to fight corruption. In the view of the educational concept, anti-corruption education materials in schools are: (1) what and where corruption (2) moral issues, (3) corruption and human rights, (4) combat



corruption, 5) corruption and market economy, (6) corruption and law, (7) corruption and democratic society.(Mantasiah, 2016; Manurung, 2012).

Therefore, the task of education is to instill honesty values to every component in it, be it students, staff teachers, and other components. Anti-corruption education is a form of education that deals with ways to instill honesty in students through a series of educative ways and strategies (Spreitzer, Theimer, Petersen, Demers, & Terry, 1999). Creative educators will always create ideas in designing new learning models that enable learners to achieve their learning goals with satisfaction. To obtain the new learning model is needed method of research and development of learning model. The method of learning model development is not much different from other product development methods. The development procedure is shorter because the resulting product is not too risky and the impact of the model is limited to the targeted learners.

For junior high school children, trusting in anti-corruption education is very useful if it is a fun, educational game. Furthermore, the learning media is "learning resources other than teachers which are referred to as liaison messages that are held and created by teachers or educators (Sadiman, Rahardjo, & Haryono, n.d.). In other words, that learning media is all forms that people use for the process of information in learning, to provide motivation and innovation in learning, to occur the learning process in students effectively and efficiently. In this case, effectively means giving high results regarding the message and the interests of students who are learning. While efficient means have the power to be reviewed regarding how its use, time, and place. Learning media are said to be efficient when the use is easy, in a short time can reach a broad content, and the required place is not too broad. The media must also be "communicative, meaning that the media is accessible to understand the meaning, in other words, what is displayed through the media is easy for students to understand.

Creative use of the media can enable students to learn better and improve student performance by the goals to be achieved. Also, the use of media in the learning process can also be an attraction for students, to change the role of teachers become more favorable. During this time, the teacher acts as an informer to the students, and the process can repeatedly occur for the same topic so that with the media used can provide more flexibility for teachers in the learning process. So the media in learning is any form of communication tool that can be used to convey information from the source to the students who aim to stimulate the thoughts, feelings, and willingness of students in following the learning activities. Media functions other than used to deliver the whole learning can also be used to convey a specific part of the learning activities, as well as provide strengthening motivation for students.

From this description, this paper aims to explain how to set up a framework for the development of anti-corruption learning model for junior high school students. Anti-corruption education in learning can provide a meaningful experience for learners because they can understand, internalize, and actualize it through the learning process. If anti-corruption culture continues to be developed as an effort to establish integrity, then it is likely that the development of anti-corruption learning model will be more efficient. This anti-corruption learning model is expected to be able to learn students later to understand better what is corruption and its consequences for the nation and state and dare to say "NO" to corruption so that there will arise awareness together to rise against corruption. Thus anti-corruption learning among learners should be applicable, not only to the school but the higher education.

## **2.0 Research Method**

This paper is an initial stage of research and development with the qualitative descriptive approach. The goal is to provide an overview of the framework of the concept of developing an anti-corruption learning model in junior high school. The development of this learning model refers to the ADDIE model consisting of 5 stages: analysis, design, development, implementation, and evaluation.

## **3.0 Result**

The framework for developing an anti-corruption learning model for junior high school students uses the approach of the ADDIE Model, which consists of five steps, namely analysis, design, development, implementation, and evaluation. The research method is to compile the framework of learning model development, they are:

### **3.1 Analysis**

This stage is the initial stage of model development activities. There are two parts to this stage: study literature and field study. Literature studies include relevant studies as well as fundamental theories of character education as well as learning strategies in junior high school. While, the field study was conducted by explorative about the student condition, teacher's ability, classroom condition and anti-corruption teaching materials.

### **3.2 Design**

The design phase of the model begins with the initial draft of the device and the model of the anti-corruption learning model. The drafting is based on appropriate competency standards for the material to be developed. Furthermore, the development of the model continued with the application of necessary competencies from the chosen lesson. The linkage of learning materials with anti-corruption materials is analyzed by developing a matrix of relationships between the initial material and the material to be integrated. The design stage produces an instructional strategy for the selected material.

### **3.3 Development**

At this stage, design validation is a process of activity to assess whether the product design is valid or not. In this stage validation is still an assessment based on rational thinking. Product Validation is performed by presenting several experts to evaluate and assess the initial product that has been produced. The product of development is student book, student worksheet, and anti-corruption module.

### **3.4 Implementation**

This stage is the implementation of field trials to assess products that have been produced based on facts in the field. In this step, product revision is also done if in the real condition there are still deficiencies and weaknesses. This trial is performed as a stage to assess the practicality of the resulting model.

### **3.5 Evaluation**

At this stage evaluated the resulting product. This evaluation is done at every stage, so the Final Prototype of the anticorruption learning model prepared can be justified.

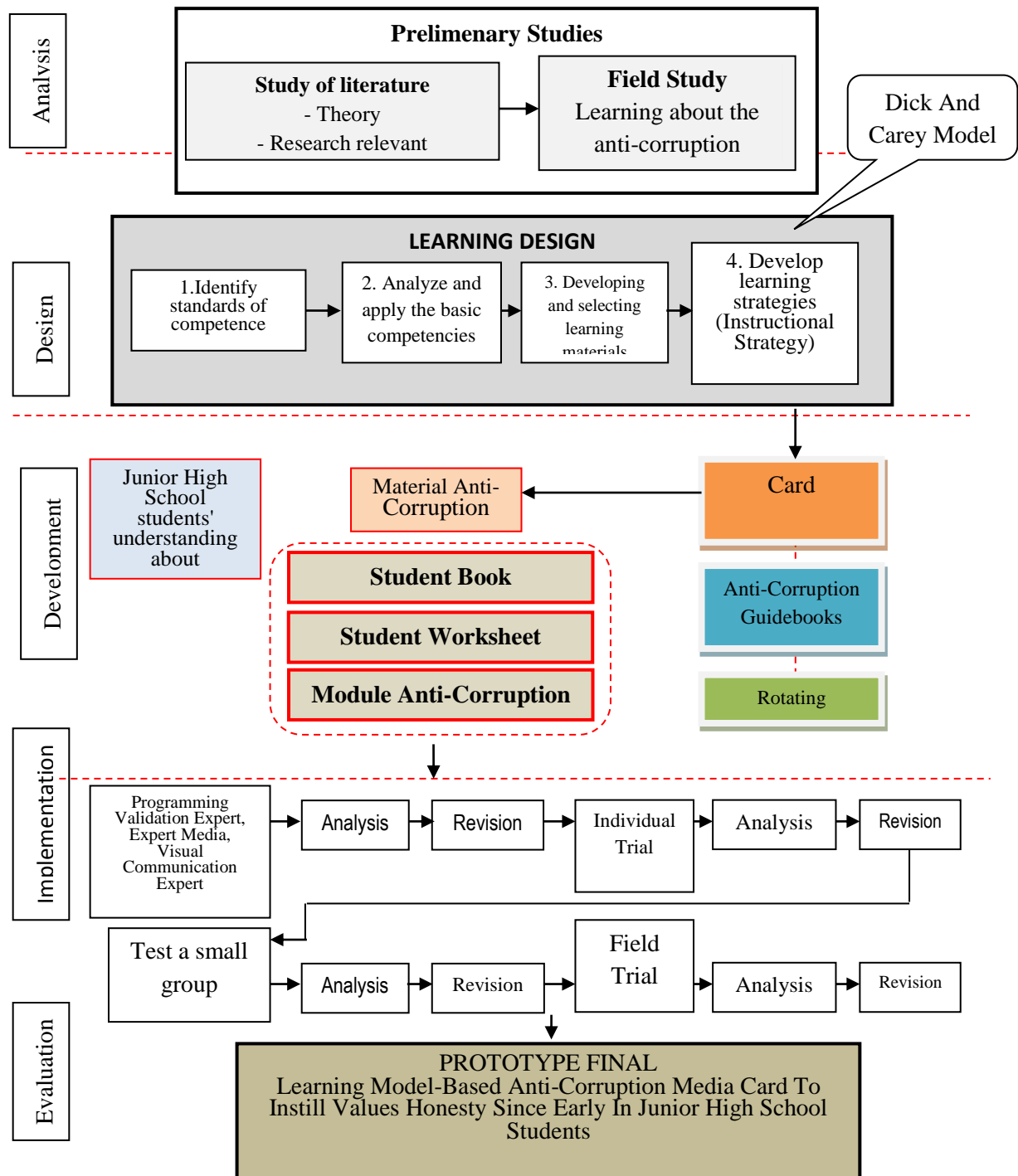


Fig. 1. The Framework of Learning Model Anti Corruption Development

The conceptual framework is a basic concept of the development of anti-corruption learning model in junior high school. The presentation of the framework is useful information for the school management to develop a learning model that continues to grow. The challenge of developing the learning model is the answer to the students' need for accurate information and varied learning models. In detail, the framework developed in developing the anti-corruption learning model can be seen in Figure 1.

#### 4.0 Conclusion

The development of anti-corruption learning model in secondary school begins with the framework compilation stage. The framework describes the sequence of activities that should be done systematically in model development. Also the framework also describes the product of this activity. The products are student book, student worksheet, and anti-corruption module. The development stage involves the expert as a validator to ensure that the resulting product is feasible to apply to secondary schools.

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## **The Importance of Understanding the Syari'ah Banking**

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### **Abstract:**

The economy in Indonesia is not separated from the conventional banking system. This is evidenced by the Law No. 7 of 1997 on conventional banking where the core of this law is the definition of banks in general is to collect funds from the community in the form of savings and then returned again to the community to improve the standard of living of the community. Types of banks based on their operational activities are conventional bank and syari'ah bank. The differences between Islamic Banking and Conventional Bank consists of the Law used, concepts/systems, and results sharing. The role of Syari'ah Bank in Indonesian Economy encompasses the role for Indonesian society and the roles as a balancing system for the economy and the real and monetary sectors.

**Keywords:** effectiveness, dual expertise and vocational high school

### **1.0 Introduction**

The economy in Indonesia is not separated from the conventional banking system. This is evidenced by the Law No. 7 of 1997 on conventional banking where the core of this law is the definition of banks in general is to collect funds from the community in the form of savings and then returned again to the community to improve the standard of living of the community. On the other hand, the development of syari'ah banking in Indonesia is very rapid, as evidenced by the data processed by Finance Service Authority until April 2016 the number of syari'ah banks in Indonesia amounts to 199 Islamic banks of 12 Syari'ah Commercial Bank, 22 Syari'ah Business Unit, and 165 Islamic Rural Banks. The role of syari'ah banks in spurring regional economic growth is increasingly strategic in balancing the structure of the economy.

The understanding and socialization of syari'ah banking about products and systems to the people of Indonesia is very limited. Although the population of Indonesia is predominantly Islamic, but the development of syari'ah banking is slow and underdeveloped just like conventional banking. In this case, the author background to compose papers on syari'ah banking. The more advanced technological developments in modern times today, the people of Indonesia understand about the financing and products of Islamic banking, and know the advantages of Islamic Banking where mudharabah financing can provide the potential to contribute to the real sector.

Bank is a financial business that raises funds from people who are over-funded and re-channeling to people who lack the funds, also provide other bank services for profit motive as well as social for the sake of improving people's lives (Kabir, Worthington and Gupta, 2015).

Meanwhile, according to Law No. 10 of 1998 on banking, it can be concluded that the banking system is a business entity that includes three activities: raising funds, channeling funds, and providing other services. Fund raising activities are the main activities of the bank while providing other services only support activities. Banks are financial institutions that collect public funds and then distribute it back to the community, and provide other bank services.

## **2.0 Types of Banks Based on their Operational Activities**

### **2.1 Conventional Bank**

Conventional bank is a bank whose operational activities apply the method of interest. Examples of conventional banks are commercial banks and rural banks (Ika and Abdullah, 2011). Conventional banks generally operate by offering products and services such as:

- a) Collecting funds include savings, demand deposits, and time deposits.
- b) Reallocate the collected funds by providing credit in the form of investment credit, working capital credit, and consumer credit.
- c) To serve financial services, among others, clearing, collection, trustee, underwriter, securities trading, or bank draft.
- d) Funds obtained by conventional banks can be obtained from outside parties, such as customers in the form of demand deposits, deposits on call, stocks, bonds, certificates of deposit, transfer funds. These sources are the largest source of bank income which is allocated for primary reserves, secondary reserves, investments, or credits.

### **2.2 Bank Syari'ah**

Syari'ah bank is a financial bank institution that uses the principles in accordance with Islamic syari'ah and in the manner of Muamalah (Kabir, Worthington and Gupta, 2015; Saraç and Zeren, 2015). Bank syari'ah was established in Indonesia on 18 - 20 August 1998 by Majelis Ulama Indonesia (MUI). Islamic banks are state financial institutions that provide credit and other services within the payment traffic and also the circulation of money that operates using the principles of syari'ah in Islam. The operations of syari'ah banks are also based on legal and regulatory foundations that support the development of syari'ah banks in Indonesia in Law No. 7 of 1998 which is refined in Law No. 10 of 1998. Even the MUI as a religious foothold in 2003 suggests that bank interest is haram and includes interest.

Efficiency, justice, and togetherness are basic philosophies in the activities of syari'ah bank operations. The syari'ah bank in terms of pricing differs considerably from the conventional. Syari'ah bank pricing is based on bank agreements with customers who deposit funds in accordance with the time period and loan funds. Terms of syari'ah-compliant bank:

- a) Does not contain elements of tyranny
- b) Excludes usury
- c) No fraud
- d) Do not endanger your own party
- e) Does not contain the element of gambling
- f) Does not contain the forbidden matter.

### 3.0 Differences between Islamic Banking and Conventional Bank

#### 3.1 Based on the Law used

In conventional banks, all transactions and agreements are made with laws already applied in Indonesia (Ika and Abdullah, 2011). The law used is civil and criminal law. While in Islamic banks, all laws used must be in accordance with Islamic syari'ah based on Al Qur'an and Hadits which has been filled by Majelis Ulama Indonesia (MUI). Laws applied to syari'ah banks are:

- a) Akad Al Mudharabah (profit share)
- b) Al Musyarakah (pengksessian)
- c) Al Musaqat (farm cooperation)
- d) Al ba'i (profit sharing)
- e) Al Ijarah (rent rent)
- f) Al Wakalah (Agency)

#### 3.2 Based on Concepts and Systems

In a conventional bank, the concept and payment system involves interest. Interest is the determination of the reward or the result of the remuneration provided to the customer who owns the funds who have collected the funds to the bank through savings, demand deposits or deposits. As for the community of users of funds from banks, interest is the determination of expenses that are deposited on credit. Conventional banks prefer to get profit or profit oriented. While in Islamic banks, the concept and the system is governed by the syari'ah. Where the contract is a statement of basic attachment to conduct transactions between syari'ah banks with their customers. The community of the funds collects the funds in the syari'ah bank with the concept of funding Al Waidah (Giro) and Al Mudharabah (Savings and deposits), in which the profit-sharing system of the bank granted to the community of the owner of the fund. As for the community of users of funds, the concept of channeling of funds from Islamic banks, among others; Profit sharing (Mudharabah/Musyarakah), Sale and Purchase (Murabahah, Salam, Istishna', Ijarah), Services (Qardh, Hawalah, Kafalah, Wakalah, Rahn). Islamic banks are profit oriented, prosperity, and happiness of the afterlife.

### 4.0 Results Sharing

<b>Interest (Conventional Bank)</b>	<b>Profit Sharing (Islamic Bank)</b>
<ul style="list-style-type: none"> <li>• Interest is calculated from borrowed funds (fixed / fixed).</li> <li>• The amount of interest payments does not increase despite the number of profits doubled / boom</li> <li>• The amount is already known</li> <li>• Existence and calculation of interest is in doubt</li> <li>• Determination of the magnitude of the result at the beginning</li> <li>• Contrary to QS Luqman: 34</li> </ul>	<ul style="list-style-type: none"> <li>• Determination of the magnitude of the result after trying / results.</li> <li>• Revenue sharing is agreed upon by the proportion of the division (ratio)</li> <li>• The amount of profit sharing increases according to the increase in the amount of revenue</li> <li>• The amount is not known before</li> <li>• No one doubts the validity of profit-sharing gains</li> <li>• Implementing QS Luqman: 34</li> </ul>

## **5.0 Based on Customer Relationship with the Bank**

Differences Islamic banks and conventional banks can also be seen from the customer relationship with the bank. Conventional banks treat customers as creditor or debtor. If the credit payment by the debtor is current, then the bank will give the information smoothly. However, if the loan repayments are stalled, then the bank collect, even culminate the confiscation of assets used unlike conventional banks. Syari'ah banks treat their relationships with clients as partners with transparent ties. Thus, causing customers of syari'ah banks are approximating having an emotional connection with the provider of financing facilities.

## **6.0 The role of Syari'ah Bank in Indonesian Economy**

### ***6.1 Role for Indonesian Society***

Micro Small and Medium Enterprises (MSMEs) that have been widely known to the people of Indonesia (Berger and Udell, 2002). MSMEs have characteristics to reduce the number of poor people who are dominant in the economic structure. With the existence of Islamic banks amid the anxiety of society, syari'ah banks can highlight its role as a bank that has Islamic principles. With the structure of the majority of Indonesians embracing Islam, the Islamic banking system is more likely to operate than conventional banks.

The agrarian sector is a source of life for the people of Indonesia. Although now the agrarian sector is less desirable because the land is not as it used to be, Islamic banks still have a chance because of the product Salam and Istishna'. MSMEs' endurance as a large alternative source of foreign exchange shows real economic activity is still running in accordance with the existing economic potential. Even MSMEs save the country's economy at a time when the national economy is faced with a storm of financial crisis that often hit the global economy. Syari'ah banks on MSME sector is also shown by various financing strategies by individual syari'ah banks individually such as the opening of micro - finance service centers such as MSME outlets/centers.

### ***6.2. Roles as a Balancing System for the Economy and the Real and Monetary Sectors***

Syari'ah banking can change the color of the new real sector in Indonesia's economic system because in syari'ah banking there is a staging process as an alternative to replace the interest system in conventional banks. The interest rate of conventional banks can weaken the real sector so that it affects macroeconomic formation system. Justice which is the concept of Islamic economy is always presented in the development of the monetary sector associated with the real sector. Islamic banking does not use new money acceleration in encouraging the growth of the real sector.

However, Islamic banks recommended the acceleration of money and the construction of infrastructure of the real sector. The excess liquidity is not lent at interest, but advocates a virtue loan and business cooperation in the form of mudaraba and musharaka. In the Islamic economic system, the interest rate is not used as a policy instrument in investing, but using the actual profit rate mechanism. Therefore, it ensures the creation of a just and equitable economic order through actual profit-level mechanisms, since the profits will be divided according to the realization of the ratio of the actual profit. Profit sharing is based on real income earned.



## 7.0 Conclusion

The share of Islamic banks is more profitable than the existing interest system in conventional banks. In this case, there is a mistake in the people of Indonesia which has been considered conventional banks more profitable than syari'ah bank. In the Islamic economic system, the interest rate is not used as a policy instrument in investing, but using the actual profit rate mechanism. Therefore, it ensures the creation of a just and equitable economic order through actual profit-level mechanisms, since the profits is divided according to the realization of the ratio of the actual profit. Profit sharing is based on real income earned. Indonesians should understand about syari'ah financing and products as well as recognize the advantages of syari'ah banking where mudharabah financing can provide the potential to contribute to the real sector. To avoid interest, Indonesian use syari'ah banking that is clear the system is regulated by Islamic Shari'ah according to Al Quran and Hadits; consequently, before the transaction begins with the agreement between the banks with the customer.

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