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# THE DECISION-MAKING EMPIRICAL MODEL IN VOCATIONAL HIGH SCHOOL

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Abstract

*The objectives of this research is to know* the pattern of causal relationships inter-variables *on the decision-making empirical model in Vocational High School (SMK). The decision-making empirical model in Vocational High School, consisting of variables: (a) the adequacy of Information and Communication Technology (ICT), (b) the benefits of using information systems, (c) the ethics in decision making, (d) the contribution of school and social environments, (e) the intentions of behaviour, and (f) the patterns of decision-making. Relation between variables was tested statistically using path analysis. The results of the research are as follows. The varian explained by each variable is mathematically formulated in:* $Z_Y = 0.134\ A + 0.141\ B + 0.102\ C + 0.486\ D + 0.193\ E$. *The most dominant effect for direct effect is D to E has* $\rho_{DE} = 0,47$ *and the correlation coefficient = 0,709.*

**Keywords**: *decision-making empirical model in Vocational High School; path analysis.*

## INTRODUCTION

SMK, is a vocational secondary education institution in Indonesia. SMK has a strategic role in improving the quality of human resources in Indonesia in entering the world of work. Several important components related to the implementation of the work plan in the implementation of vocational education, as stated in Permendiknas No. 19 year 2007 (Menteri Pendidikan Nasional, 2007) on the basic and secondary education management standards, namely: school guidelines, school organizational structure, school activities, student affairs, curriculum and learning activities, Educators and education personnel, facilities and infrastructure, finance and finance, culture and school environment, community participation and school partnerships. Vision SMK is a shared goal into the future between SMK with the pemangkuk interests. Vocational vision is expected to provide inspiration, motivation, and strength for the citizens of the school in delivering students to master certain competencies in accordance with interests and talents. SMK is a future vocational education for the people of Indonesia. Products from SMK graduates are expected to become skilled workers in completing a job, in accordance with the level contained in Perpres No. 8 year 2012 (Presiden Republik Indonesia, 2012) on the Indonesian Qualification Framework (IQF).

Vocational education is an education that leads learners to work with various on-the-job training sessions, as Prosser points out in "Prosser's Sixteen Theorems on Vocational Philosophy (Cross, Wyatt, & Groves, 1985, pp. 1–4; Proser & Quigley, 1950, pp. 215–240). The 7th proposition related to decision making, vocational education, will be effective if the teacher has had successful experience in applying the skills and knowledge to the operation and work process that will be done. The focus of attention of this principle lies on the educator as the spearhead in the learning process. Comprehensive competency mastery, between operating knowledge and work processes in industry, is the main capital in the learning process. While the 15$^{th}$ proposition related to decision making is the administration of vocational education will be efficient if flexible. Vocational education should be flexible to the possibility of program improvement in accordance with the dynamics of labor requirements.

There are three basic things in view of the characteristics of vocational education (Bathmaker, 2013, pp. 90–91). First, vocational education focuses on the necessary knowledge and work skills. Secondly, general education conducts vocational skills, but does not facilitate the specific needs of vocational practice required in training the workforce. Third, pre vocational education, which is assumed that learners do not have the necessary job skills for the world of work, this emphasis is on aspects of low-level work skills such as literacy and numeracy. While Billett (2011, pp. 4–5) discusses four matters relating to the purpose of vocational education, namely: (a) the reasons of each individual in the selection of a job, (b) as the individual's initial preparation for working life, (c) individual development to improve the quality of work, (d) transition experience from one job to another.

Characteristics of vocational education include aspects (a) preparing human resources with intelligence, knowledge, personality, noble character, and skills, as well as the ability to enter the world (eg, Djojonegoro, 1998, p. 37) work; (b) a demand-driven and market-driven oriented education paradigm and no longer relying on supply-driven; (c) the required competence demands that meet the labor requirements required by the labor market with an emphasis on the mastery of knowledge, skills, attitudes, and values required by the world of work, this is necessary to generate professional workforce; (d) the true assessment of student success lies in hands-on or labor performance; (e) close relationship with the world of work is the key to successful vocational education; (f) good vocational education is responsive and anticipatory to technological progress; (g) vocational education is more emphasized on learning by doing and hands on experience; (h) require up-to-date facilities for practical activities; (i) require greater investment and operational costs than general education.

Some factors that contribute to the academic quality of vocational school are teachers and principals. Master, as set forth in the Law of the Republic of Indonesia No. 14 Year 2005 (Depdiknas, 2005) on Teachers and Lecturers, Article 1 is a professional educator with the main task of (1) educating, (2) teaching, (3) guiding, (4) directing, (5) training, (6) assessing, and (7) evaluating learners. Teach-

ers with additional duties as principals, as outlined in the Regulation of the Minister of National Education No. 28 year 2010 (Depdiknas, 2010) on the assignment of teachers as principals, are teachers who have met the general requirements and special requirements. General and specific requirements relating to: the teaching profession, technical, and administrative. In addition, school education personnel also determine the success associated with the technical aspects of school administrative services.

In conducting school activities in vocational schools, teachers, principals, and educational personnel are faced with the conditions for deciding on a particular situation. Decision making will have an impact on the dynamics that develop in SMK. There is a positive interaction between educational experts and education practitioners in assessing school performance and performance indicators (Nuchron, Soenarto, & Sudarsono, 2013, p. 87). Teachers, principals, and education personnel have a strategic role in managing the managerial functions of the school. The managerial functions are inseparable from the functions contained in the principles of management, among others functions: planning, organizing, activation, and control (Quinn, 2010, pp. 12–13; Negulescu & Doval, 2014, pp. 858–863; Lee, 2013, pp. 1–16). The four functions are synergized when teachers, principals, and education personnel are faced with a decision-making process.

Decision theory focuses on several choices of the best choice, with three main characteristics (Sadovykh, Sundaram, & Piramuthu, 2015, p. 3): (a) cognitive processes, meaning processes of thinking in the decision-making process; (b) an alternative decision, and (c) the outcome of the decision. Thus, the decision is an option, while making a decision means determining the choice of one of several alternative choices (Hatamura, 2005, p. 2). Wang, Liu, & Ruhe (2004, p. 2) state that decision-making is the selection process of the available alternative options against predetermined decision criteria.

Decision-making is one of the key elements of leadership management in schools. In its implementation, there are 3 models of decision making, namely: (a) normative, (b) descriptive, and (c) prescriptive (Athanasou & Van Esbroeck, 2008, p. 164). Although decision-making has been well-planned according to criteria, there are three important aspects to consider (Pomerol & Adam, 2004, p. 649), namely: (a) identifying all alternative decisions, (b) determining the consequences that occur as a result Of the alternatives taken, and (c) evaluate all alternative possibilities of the decision taken.

Appropriate decision-making is a key aspect of successful school management. School dynamics depend on the outcomes of decisions taken by teachers, principals, and education personnel. The decision-making process undertaken by teachers, principals, and education personnel will determine the direction and policy of the school. Decision-making is inseparable from ethical considerations (Yoon, 2011, p. 2403). Factors influencing ethical considerations in decision-making include: (a) the fairness of a decision-making outcome, (b) the order of karma, (c) relativism, in the context of decision-making; (D) selfish, and (e) the merits of a decision. Therefore, decision-making tends to be influenced by individual thought processes and the school environment.

Decision-making is a selection process among several alternative options available in a variety of circumstances. The decision-making process, associated with innovation, is preceded in several ways (Rogers, 1983, pp. 169–186): (a) identification of emerging and developing problems; (b) the scope of the matter, relating to the existing components, eg curriculum, resources and infrastructure, student affairs, or relationships with the world of work and social environment that surrounds the existence of schools; (c) internal factors of the school organization on the involvement of stakeholders on some of the choices of a decision; and (d) the impact on the course of school management as a result of decisions made by the principal. The four ways in making these decisions each school has a different variance. This has an impact on different decision-making results.

Eight important points in the decision-making process (Hatamura, 2005, p.17) are: (1) the first point shows the record of how the decision was made; (2) a decision-making process required preliminary information from a problem and motivation on which to base Decision making, (3) functional requirements and constraints when making decisions, (4) one's thinking and possible doubts in making

decisions, (5) realizations and outcomes, (6) discussion and evaluation, (7) From the decision-making process, and (8) the related events and associations relate to the outcome of the decision directly and the circumstances surrounding as a result of decision-making.

The decision-making strategy is a way of constructing a problem to be solved based on the planned completion steps (VanSchaik & Sol, 1990, p. 53), further it is said that there is a positive relationship between decision-making strategies and quality decision-making results. There are three fundamental questions as a driver of quality decision making (Negulescu & Doval, 2014, p. 862), namely: (a) how decisions are made ?, this is related to environmental aspects, strategy, ethics, empowerment, information, and feedback; (b) whether the decision-making is related to the program, the choice, and minimize the risk? And (c) when the decision was taken? It depends on two things: resources and opportunities.

Based on the explanation of the description, this study aims to determine the empirical model of decision making in SMK and the impact of each variable associated with the dynamics that developed in SMK.

## RESEARCH METHODE

Empirical model of decision making in SMK developed in this research using quantitative-positivistic approach. The time of the study was conducted in the even semester of the 2015/2016 school year. Place of research in SMK in Special Region of Yogyakarta. The sample of this study amounted to 144 teachers of SMK in the Special Region of Yogyakarta.

The research procedure includes: (a) determining the research variables of the proposed model, (b) formulating the relationships between the variables of the proposed model, (c) preparing the research instruments on each of the variables and indicators, (d) conducting the instrument testing process, (e) conducting the data retrieval process, and (f) performing data analysis.

The research variables developed in this study, to determine the empirical model of decision making in SMK. Each variable consists of one or more indicators, which further compiled the research instrument items. The cornerstone of the determination of variables along with indicators and instrument items is based on theoretical studies that reinforce the argument for the empirical model of decision making. The results of this activity in the form of instrument grids, indicators, and research instrument items.

The research instrument developed contains six research variables, namely: availability of information and communication technology infrastructure, information system benefit, ethics in decision making, school and social environment that contribute to decision making, intention to behave in decision process, and decision making pattern.

Data analysis technique using path analysis. The use of path analysis aims to display both direct and indirect effect between independent variables and dependent variables. The basic assumptions in using path analysis (Pedhazur, 1997, pp. 804–837), are: (a) relationships between variables in linear, additive, and causal models; (b) each residue is not correlated with any of the variables contained in the model; (c) there is a one-way causal relationship; (d) no multicollinearity may occur.

Data analysis is done to ensure that the data has been obtained is valid and reliable. It aims to find useful data information to know the independence of variables, dependencies of variables, and relationships among variables studied, in order to determine the model tested related to the research variables.

Data analysis has several aspects relating to the reliability and validity of the research variables. Estimation The reliability of the empirical model of decision making is done using an internal consistency approach using the Cronbach Alpha coefficient formula. The instrument reliability criterion when the coefficient of combined grains (alpha reliability) of 0.70 or more then the instrument is declared reliable.

Content validity aims to examine both the poorness of a research instrument based on the content of an instrument considered a conceptual framework.

The empirical model of decision making proposed in this study is shown in Figure 1. The exogenous variables in Figure 1 are shown in the variable labeled A and the endogenous variable shown in the variable labeled B, C, D, E, and F.

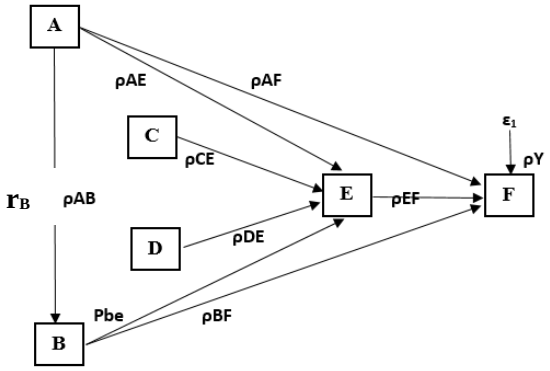


Figure 1. Proposed empirical model of decision-making pattern in SMK.

Information:
(A) : availability of information and communication technology infrastructure,
(B) : the benefits of information systems,
(C) : ethics in decision making,
(D) : the school environment and social environment that contribute to decision making,
(E) : the intention of behaving in the decision-making process,
(F) : decision-making patterns.

## RESULTS AND DISCUSSIONS

### Description of the Variable

The pattern of decision making in SMK developed in this research with quantitative-positivistic approach using path analysis. The use of path analysis aims to display a causal relationship pattern among a set of variables. There are 6 research variables, namely: information and communication technology infrastructure, labeled (A); The benefits of information systems, labeled (B), ethics in decision making, labeled (C), school environment and social environment contributing to decision making, dumped (D); Intention to behave in the decision-making process, labeled (E); And decision-making patterns, labeled (F). Description of the variable of each variable is shown in Table 1.

Table 1. Variable description

| No | Variables | Operational Definition | Indicator |
|---|---|---|---|
| 1. | School Information and Communication Technology (ICT) Infrastructure (Labeled: A) | Availability of ICT devices in school environments. | Schools facilitate internet connection via wi-fi network (non-wired network) and cable network. |
| | | | Schools facilitate computer devices or laptops or smartphones that are connected to the Internet network |
| | | | All school areas have been connected to the internet network (no blank spot area) |
| | | | Schools provide ICT teams that are ready to assist in ICT-related issues |
| 2. | Benefits of information systems. (Labeled: B) | The direct use that teachers can enjoy, because of the availability of the Information Technology infrastructure. | Decisions to be made by school leaders, teachers, and school administration personnel require data support. |
| | | | The data used as the basis for decision making requires accurate data. |
| | | | Information systems needed to support the smoothness, accuracy, and speed in decision-making relating to schooling tasks. |
| 3. | Ethics/ *deontology* (Label: C) | The belief that an action in decision-making is administratively correct and does not violate any applicable regulations. | Ethics deals with Responsibility<br>Circumstances must bear all things (If there is a problem related to legislation, it can be blamed) |
| | | | Ethics deals with School Interests<br>(Preferably the interests of the school, as opposed to self-interest) |
| | | | Ethics deals with Integrity<br>(Quality, nature, or circumstances that show unity intact so as to have the potential and ability to emit dignity and honesty) |
| | | | Ethics deals with Objective behavior<br>(A real situation, without being influenced by opinions or views of others and others). |
| | | | Ethics deals with adherence to principles<br>(A habit that does not change from the stipulated provisions) |

| | | | |
|---|---|---|---|
| 4. | School and social environment.<br><br>(Labeled: D) | The strength of the school community as well as the various norms that influence the behavior and interaction of teachers, students, school administrators; Along with community involvement in supporting school activities. | Encouragement for students in achieving in school (Results achieved by students in academic and non academic fields related to the learning process and impact of learning). |
| | | | Encouragement for teachers and administrative staff in achieving in school (Results achieved by teachers and administrators of schools in the promotion of paedagogic, professional, social, and personality competencies). |
| | | | Happy to work (All work related to school tasks can be completed with pleasant ambience) |
| | | | The relationship between superiors and subordinates (The working atmosphere in the school reflects the mutual care, nurturing, and upbringing between school leaders, teachers, and school administration personnel) |
| | | | Satisfaction with school leadership (The pleasant psychological conditions felt by teachers and school administration personnel due to the fulfillment of all the learning needs and adequacy requirements) |
| | | | Community participation, including business and industry, in school activities (Community participation in activities organized by schools) |
| 5. | Behave intention<br><br>(Labeled: E) | Intentions to use information systems as decision support | Use of school information systems that are supported by data that is accurate and accountable academically and administratively. |
| | | | Strive to develop school information systems that are backed up with accurate and accountable databases in academic and administrative. |
| | | | School leaders prepare School TIK development teams that are able to accommodate the needs of ICT systems in school activities and administration. |
| 6. | Decision making patern<br><br>(Labeled: F) | Something someone receives and is used as a guide in making decisions. | Schools use school information systems as part of the use of ICTs in schooling activities (such as: learning and school administration tasks). |
| | | | In performing the school administrative function, the school's academic community (school leaders, teachers, school administrators, and students) uses the application software as part of the completion of schooling tasks. |
| | | | To improve the use of ICTs in various school interests (learning and school administration tasks), schools facilitate the increased competence of ICT use through education and training. |

The number of items in the instrument to determine the decision-making pattern in SMK consists of: (a) Information and communication technology infrastructure (A) variables of 4 items, each consisting of items 1, 2, 3 and 4; (b) Information System Benefit (B) variable of 3 items, each consisting of items 5, 6 and 7; (c) the decision-making Ethics variable (C) of 5 items, each comprising items 8, 9, 10, 11, and 12; (d) the school and social environment variables (D) of 7 items, each of which consists of 13, 14, 15, 16, 17, 18 and 19; (e) variables of intention to behave in decision-making (E) of 3 items, each consisting of items 23, 24 and 25; And (f) the decision pattern (F) variable of 3 items, each consisting of items 20, 21, and 22.

Correlation between research variables obtained correlation value shown in Table 2. Correlation analysis between variables using software SPSS 6.0.

Table 2. Correlations between variables

| Variabel | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| A | 1.000 | 0.231 | 0.213 | 0.196 | 0.137 | 0.310 |
| B | 0.231 | 1.000 | 0.517 | 0.508 | 0.590 | 0.585 |
| C | 0.213 | 0.517 | 1.000 | 0.687 | 0.606 | 0.654 |
| D | 0.196 | 0.508 | 0.687 | 1.000 | 0.709 | 0.790 |
| E | 0.137 | 0.590 | 0.606 | 0.709 | 1.000 | 0.701 |
| F | 0.310 | 0.585 | 0.654 | 0.790 | 0.701 | 1.000 |

Coefficient of correlation R = 0.843 (R2 = 0.710). This shows the degree of relationship between variables (A, B, C, D, E, and F) at a very strong level (0.843) for the scale (0 to 1). The result of F test shows that the variables (A, B, C, D, and E) are correlated significantly with the variable (F) by using t test at the 0.05 significance level, the variables (A, B, C, D, and E) are partially related to the variable (F). VIF values are between 0.1 and 10, this means there is no multicollinearity between variables (A, B, C, D, and E). Equation estimation between variables, shown equation [1]:

Y' = -0.495 + 0.086 A + 0.131 B + 0.067 C + 0.206 D + 0.186 E ....(1)

While "Variant explain by" each variable (A, B, C, D, and E) to variable (F) is shown in equation (2):

$Z_Y$ = 0,134 A + 0,141 B + 0,102 C + 0,486 D + 0,193 E ..... .. (2)

The result of equation (2) shows that the coefficient of variable D, the school environment and social environment, has the greatest contribution in the empirical model of decision making in SMK. This means that the school environment and social environment have significant strength to contribute to decision making in SMK. Influence the behavior and interaction between teachers, students, school administration personnel; Along with community involvement in supporting school activities.

The result of path analysis from model usulam, as shown in figure 1, obtained the estimated path value shown in Figure 2.

Path analysis on empirical model of decision making in SMK using software Lisreal 8.1., Got value $\rho_{AB}$ = 0,24; $\rho_{AF}$ = 0.18; $\rho_{AE}$ = -0.24; $\rho_{BE}$ = 0.29; $\rho_{BF}$ = 0.22; $\rho_{CE}$ = 0.14; $\rho_{DE}$ = 0.47; $\rho_{EF}$ = 0.55. In Figure 2 there is a negative path diagram, ie: $\rho_{AE}$ = - 0,024. This means that intention to behave in decision making is not directly related to the availability of ICT infrastructure provided by schools, or teachers have facilitated themselves in the availability of ICT. Therefore, ρAE is not included in the next path analysis.

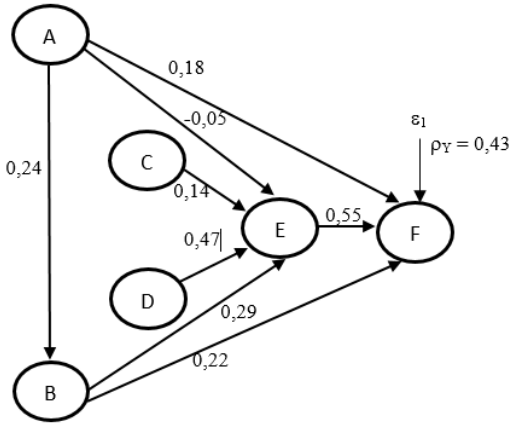


Figure 2. The Result of Model Analysis after Analysis using Path

After $\rho_{AE}$ is not included in the proposed model, a second path analysis is performed. The result of the path analysis without the $\rho_{AE}$ opticality shown in Figure 3.

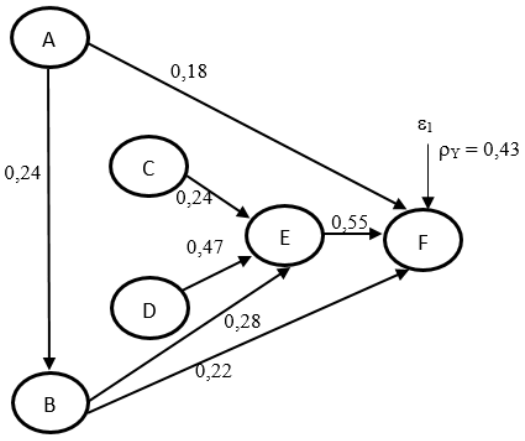


Figure 3. The Result of Model Analysis after Second Stage Path Analysis

The results of the model analysis after the second path analysis using Lisreal 8.1 software. Obtained value $\rho_{AB} = 0.24$; $\rho_{AF} = 0.18$; $\rho_{BE} = 0.28$; $\rho_{BF} = 0.22$; $\rho_{CE} = 0.24$; $\rho_{DE} = 0.47$; $\rho_{EF} = 0.55$.

(1) the availability of ICT devices in the school environment directly effect the decision-making pattern for teachers. This is in line with the role of ICT in management put forward by Spanos, Prastacos, & Poulymenakou (2002, pp. 661–662), inter alia as: (a) strategic planning related activities; (b) simultaneously can help control wheels Organization, (c) assist the management of resources within the organization, in this case the school. ICT can be used to help counseling activities at school (Beidoğlu, Dinçyürek, & Akıntuğ, 2015, p. 466).

(2) the availability of ICT devices in the school environment directly effect the benefits of information systems. The use of information systems in Schools can benefit as Marnewick (2016, p. 1) puts it (2015, p.1). This is closely related to the adaptation of information technology as a result of the use of supply chain management in information systems developed in schools.

(3) ethics in decision-making, administratively correct and not in violation of applicable regulations, directly effect the intention to behave in the decision-making process. This means that Ethics is closely related to the fundamental relationships between individuals and groups that serve to guide moral-based behavior (Stahl, Eden, Jirotka, & Coeckelbergh, 2014, p. 811).

(4) the school environment and social environment directly effect the intention of behaving in the decision-making process. This is in line with that of Soenarto (2014, p. 2) that the school environment as a micro system related to the dynamics that developed in the school environment, as well as the social environment as a macro system as a school school pemangkukan.

(5) the benefits of information systems directly effect the intention to behave in the decision-making process. In addition, the benefits of information systems have an indirect impact on the availability of ICT infrastructure.

(6) the benefits of information systems directly effect the pattern of decision-making. In addition, the benefits of information systems have an indirect effect on the availability of ICT infrastructure.

(7) the intention to behave in decision-making directly effect the decision-making pattern. In addition, the intention to behave has an indirect impact of ethics in decision making and the school environment and social environment.

In summary, the estimates of coefficient of correlation and direct effect, indirect effect, and overall effect on each variable are shown in Table 3.

Based on the summary of the impact on each variable in Table 3 it is seen that the highest direct impact on the coefficient of path estimation is obtained from the variable D to the variable E with the estimated path value of $\rho DE = 0.47$ and the correlation coefficient of 0.709. It can be interpreted that "the strength of the school community as well as the various norm systems affecting the behavior and interaction between teachers, students, school administration staff and community involvement in supporting school activities" have a direct and highly correlated impact on "the intention to use information systems as Supporters of decision-making ".

Table 3. Summary of effect on each variable

| No. | Variable | Correlation Coefficient | Effect | | |
|---|---|---|---|---|---|
| | | | Direct Effect | Indirect Effect | Total Effect |
| 1 | A – F | 0,310 | 0,180 | - | 0,180 |
| 2 | A – B | 0,231 | 0,240 | - | 0,240 |
| 3 | C – E | 0,687 | 0,140 | - | 0,140 |
| 4 | D – E | 0,709 | 0,470 | - | 0,470 |
| 5 | B – E | 0,590 | 0,280 | (0,280 * 0,240) = 0,067 | 0,347 |
| 6 | B – F | 0,585 | 0,220 | (0,220 * 0,240) = 0,053 | 0,273 |
| 7 | E – F | 0,701 | 0,550 | (0,550 * 0,470) = 0,259 | 0,809 |
| 8 | E – F | 0,701 | 0,550 | (0,550 * 0,240) = 0,132 | 0,682 |

Koeffisen lowest estimation on direct impact obtained from variable C to variable E equal to ρCE = 0,140 and correlation coefficient equal to 0,687. It can be interpreted that "the belief of an action in decision-making is administratively correct and does not violate the prevailing rules" has the lowest direct impact and has a high correlation in "the pattern of decision making in SMK".

The coefficient value of the path estimation at impact is indirectly obtained from ρEF = 0.259. The indirect effects of the variables E to variable F are influenced from variables C and variable D. It can be interpreted that "the intention to use information systems as decision support supporters" directly impacts the "decision-making pattern" influenced by ethics based on a The belief that the action in the decision-making is administratively correct and does not violate the prevailing rules "and is influenced by" the strength of the school community as well as the various norms that influence the behavior and interaction between teachers, students, school administration personnel and community involvement in supporting school activities ".

## CONCLUSION

Based on the research result, it may be concluded that:

First, factors contributing to the decision-making pattern in SMK consist of: (a) ICT adequacy, (b) benefits of use of information systems, (c) ethics in decision making, (d) contribution of school environment and social environment, (e) intention Behave in decision making. Significant contribution, statistically, in the pattern of decision making in SMK is contributed from elements related to school environment and social environment.

Second, the highest direct impact on the coefficient of path estimation is obtained from the D variable (school environment and the community environment) to the variable E (behavioral intent) with the estimated path value of ρDE = 0.47 and the correlation coefficient of 0.709.

The suggestions that may be provided for this research is teachers, principals, and educational personnel, in peroses decision-making required a set of systems that can support decision-making. The system in question is an ICT-supported decision making support system.

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# LEARNING OUTCOMES WITH THE APPLICATION OF PRODUCT BASED ENTREPRENEURSHIP MODULE IN VOCATIONAL HIGHER EDUCATION

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Abstract

*This paper aims to explore and explain the application entrepreneurship module based products in higher vocational education. Methods of the development of this research using stages of Analysis, Design, Development, Implementation (ADDI). Subjects were students who are taking entrepreneurship courses in higher vocational education. The technique of data analysis was the learning outcomes of the application of product based entrepreneurship module which consisted of, (1) the results of the cognitive aspects of learning achievement test used in the form of multiple-choice tests; (2) the study results in the affective aspects obtained from the measurement results against predefined criteria, with special sections that assess students' attitude during the process and attitude of learning, particularly in the work of making a product; (3) the results of study on psychomotor aspect views from the observation of activities and work activities done by the students. Based on cognitive aspects of learning outcomes for entrepreneurial learning showed that test before using the product based entrepreneurship modules have an average of learning outcomes is quite effective and after using the product based entrepreneurship modules have an average is the effective category. The average results of student learning in psychomotor and affective aspects before using the module are quite effective and after using the product based entrepreneurship module psychomotor and affective aspects have an average result of learning is very effective. It can be concluded that learning with product based entrepreneurship module can improve student learning outcomes in higher vocational education.*

***Keywords:*** *Entrepreneurship Module-Based Products, Cognitive, Affective and Psychomotor*

## INTRODUCTION

Higher education serves to develop the ability and character development, as well as a dignified civilization in order to educate life of the nation. Another function is to develop innovative academicians, responsive, skilled, competitive, and cooperative through the implementation of the three responsibilities. Higher educations also serve to develop a science and technology by observing and applying the values of humanities. One part of higher education is the education of vocational education either at the level of technical colleges, institutions and universities. Vocational education also has a mission to prepare students to be able to face changes in their community. In addition, vocational education is required to deliver a competent workforce in order to increase productivity and efficiency as well as the readiness of the international labor market competition in the era of globalization.

For the achievement of the learning process, as stipulated in Government Regulation No. 32 of 2013 and Law No. 20 of 2003 section 15, it needs components of learning that can support the learning process. One important part of learning is learning modules and devices in the learning process in support of education in order to run effectively and efficiently. Learning modules provide an important role in learning, not least learning modules and devices in entrepreneurial learning that does not yet exist and is very far from the learning goal itself so that the output and outcome of college graduates are less qualified. Difficulties in teaching students in entrepreneurship courses must have met educators in higher education and in school, that learners tend to complain that the theory of entrepreneurship was boring, entrepreneurship courses were boring, as well as all the theory and entrepreneurship courses, may be irrelevant to the condition that occurred in the field (Fiet, 2000). In addition, as educators can also be boring and irrelevant in the eyes of students. Students may not understand that the pedagogy of entrepreneurship can be very interesting. Unfortunately, the fact that there is a process that is used to teach the theory of entrepreneurship can be tedious. Such as, the learning process will be tedious when what would have easily predicted by students. Good entrepreneurship theory can always pass the test of the application and can be applied in the field.

Almost all universities have entrepreneurship courses but not all of college graduates are capable being an entrepreneur, not least of the vocational graduates. In addition, graduates of any college graduate diploma and competency rely solely on their respective fields to look for work, but also did not get a decent job. If this condition is left unchecked then the college will contribute to the increasing of educated unemployment, based on data owned by the Central Statistics Agency *(Badan Pusat Statistik)* in 2016 and 2017 on Unemployment Rate (TPT) of university graduates start of February 2016 as many as 7.02 million people or 5.5 percent in August 2016 as many as 7.03 million people, or 5.61 percent, and the last in February 2017 as many as 6.68 million people, or 5.33 percent, figures show a decreasing of unemployment despite very little, but still intellectual unemployment rate of graduates of higher education is very worrying. This happens is caused by various factors, one of them the ability to survive in a society with entrepreneurial competence possessed still lacking. Development of higher education that is equipped with a highly entrepreneurial competence spearhead in addressing educated unemployment (intellectual).

Educated unemployment is certainly due to various factors such as lack of jobs, the growth of higher education and study programs so rapidly, and the lack of competence of the graduates or the incompatibility of competencies to the needs of users of labor, and the ability to survive in society with entrepreneurial competence possessed still less, development of vocational education which is equipped with a highly entrepreneurial competence spearhead in addressing unemployment of graduates educated both non-vocational and vocational graduates. The process of vocational education at the college not just produces labor and market-oriented vocational however expected to graduate from college are able to develop competency-based individuals in the field of entrepreneurship, which is expected that the graduates of vocational colleges graduates are able to produce many young entrepreneurship.

With the creation of engineering entrepreneur directly provide individual improve-

ment and repair the nation's economy in general. In addition, entrepreneurship education will help to influence culture and build economic growth (McKeown, Millman, Sursani, Smith, & Martin, 2006; Matley, 2005a, 2005b; Kirby, 2004; McMullan & Long, 1987).

Based on field observations conducted by a lecturer of entrepreneurship and observe the learning process, found obstacles in entrepreneurship learning among others: (1) one of the causes have not pulled this course is the unavailability of learning modules that can support the success of the process entrepreneurial learning, (2) the teaching materials used lecturers during the learning process, namely books entrepreneurial scope of the material has not fulfilled all the basic competencies that exist in the syllabus, (3) the learning process is performed on entrepreneurship courses are still focused on mastering theory and administration skills not exhaustive, only in the form exercises that do not lead the student to produce a business plan, (4) the final project of entrepreneurship courses are still not represent the rest of the material that has been described.

Associated with one of the obstacles encountered during the observation, a business plan aimed as a reference for students in new businesses when they finish the study, the fact still cannot be made by the student. This is certainly contrary to the learning outcomes of the entrepreneurship courses. After attending the course entrepreneurship is expected that each student is able to create a business plan as a provision for them in facing the business world. The fact that happened on the field, the implementation of the science of entrepreneurial learning process has not been implemented optimally. Based on the explanation of the constraints in entrepreneurial learning, it becomes the main reason for the development of entrepreneurship module based products.

With the conclusion of products based entrepreneurship module, it is expected that students are able to design a business plan in order to create new job opportunities in accordance with their fields. Therefore, there should be a development of entrepreneurship module-based products, so that later in the process of entrepreneurial learning. Based learning products are able to guide and lead the student to produce a business plan as the ultimate goal of the learning process.

One of the learnings that are relevant to the vocational field is production-based learning, this model facilitates the learner to think, analyze and capable of producing the product (Ganefri & Hidayat, 2015; Kusumaningrum, Ganefri & Hidayat, 2015; Kusumaningrum, Hidayat, Ganefri, Anori, & Dewy, 2016; Hidayat, 2017a; Ganefri, Hidayat, Kusumaningrum, Dewy & Anori, 2017; Yulastri, Hidayat, Ganefri, Islami, & Edya, 2017; Ganefri, Hidayat, Kusumaningrum, & Mardin, 2017; Hidayat, 2017b). Based learning with this product allows it to be applied in the field of vocational entrepreneurial learning, teaching and learning entrepreneurship so that students can master the material of entrepreneurship with the concept of learning by doing approach to a product-based learning model. Not only learning-based product that also has to do with entrepreneurship but the reinforcement learning models insightful student vocational life skills entrepreneurship is also strongly associated with entrepreneurship (Mursid, 2017).

The purpose of this study is limited to the implementation of results product based entrepreneurship module which is assumed to be able to help to make good changes to student learning outcomes and active students in vocational higher education.

**Module**

A module is a unit of the teaching program arranged in specific shapes for learning purposes. Russel (1994) explains that “teaching module is a package that contains a lesson unit concept". The module is a package of lessons individualize teaching programs by allowing learners to master one set of lesson content before switching to the other units of the content.

Definition module is also disclosed by Arai (2009) states, “a module is a complete unit and stand-alone and consists of a series of learning activities designed to help students achieve a number of objectives were formulated specifically and clearly”. According Sudjana & Rivai (1997) describes the module is defined as the smallest unit of the teaching and learning program in detail to explain: (1) The purpose of instructional be achieved. (2) The topic will be the basis of the learning process. (3) The main points of the material

being studied. (4) The status and function modules unity of a broader program, (5) The role of the faculty in teaching and learning, (6) The tools and resources that will be used, (7) The activities of learning to do and lived pupil sequentially, (8) Gazette the work to be completed by the student and, (9) the evaluation program will be implemented.

Limitations on the module above the opinion of experts differ but basically have in common, namely that the modules of a curriculum package is provided for independent study and the nature of learning geared to the principle of individual differences. So it can be said module is a complete measurement tool, a unit that can function individually, separately, but also can serve as the unity of all the other units.

**The Purpose of Learning Modules**

The use of modules in the learning activities intended for educational purposes can be achieved effectively and efficiently. The students can follow the teaching program according to the speed and capabilities of its own, more independent learning, self-study to know the results, emphasizing mastery of subject material optimally (mastery learning). Furthermore, Cece (1992) states the learning process through module serves to: (1) The increase motivation to learn optimally, (2) Increased creativity of lecturer in preparing the tools and materials required and individual services are more stable, (3) to embody the principle of continuous advance is not limited to, (4) to create a system of active student learning. Thus the use of the module in the learning activities is possible for every student to learn its corresponding capabilities and controlled all lesson materials in their entirety.

**Characteristics**

To produce modules that can increase the motivation to learn and can be said to be good and interesting, in the writing of the module by the directorate of education personnel (2008), if the module has the following characteristics:

***Self Instruction***

It is an important characteristic of a module, with the character it allows a person to learn independently and not depend on other parties.

***Self Contained***

The module is said to be self-contained if all the necessary learning material contained in the module. The aim of this concept is to give the students studying the learning material thoroughly because the learning material is packed into one unified whole. If you have to do division or separation of material from a competency standard/basic competence, must be done with care and attention to the breadth of competency standard / basic competencies that must be mastered by the learner.

***Stand Alone (Stand Alone)***

Stand alone is a characteristic module that does not depend on materials/other media, or should not be used in conjunction with teaching materials/other media. By using modules, learners do not need other teaching materials to learn and or tasks on the module. If the students still use and rely on teaching materials other than the modules are used, the materials are not categorized as a stand-alone module.

***Adaptive***

Modules should have high adaptability to the development of science and technology. Is said to be adaptive if the module can adjust the development of science and technology and flexible/flexible use in a wide range of hardware (hardware).

***Friendly/Familiar (User-Friendly)***

Modules should also meet the rules user-friendly or friendly/familiar with the wearer. Every instruction and exposure to information that appears to be helpful and friendly to users, including the ease of accessing the user in responding and liking. The use of simple language, easy to understand and use the term commonly used, is one form of user-friendly.

Learning to approach project work or by using module-based product disclosed by Bahri, (2009) has the following characteristics: (1) The student becomes the center or as an object that is actively studying the learning process, (2) projects planned focused on goals learning that has been outlined in the

Standards of Competence and Basic Competence in the curriculum, (3) Project developed by the questions as a framework of the curriculum (curriculum-framing question), (4) project is directly related to the real life world, (5) Students demonstrate knowledge through a product or performance, (6) Technology supports and enhances student learning. (7) Thinking skills are integrated into the project.

**Product-Based Entrepreneurship Module**

***Products Based Learning***

Learning by using a product-based learning model is learning that directs learners in systematic work procedures and standards to make or complete a product (or service), through the production process / the real work (BSNP, 2008). The product based learning module is an "open-ended form of contextual activity-based learning and a troubleshooting section through a collaborative effort" (Sunaryo, 2005). According Ganefri (2013) refers to "production-based learning models is defined as the procedures or steps that need to be performed by the educator to Facilitate learners to actively learn, Participate and interact, with a competency-orientation to produce a product either goods or services required". The definition was explained that Product based learning module contains procedures or steps that need to be done by educators to facilitate learners to actively learn, participate and interact, with the orientation of the competence to produce a product in the form of goods or services required. In addition, it is done collaboratively; Product based learning module should also be innovative, unique and focused on solving problems related to the lives of the learners or the needs of the community or the local industry.

***Assessment of Learning Outcomes by Product based learning module***

Assessment of learning outcomes with the use of product-based entrepreneurship module is basically a standard assessment of competence includes assessing aspects of knowledge, skills, attitudes, conformity of products/services, and the suitability of the execution time integrated components: preparation proposal, the implementation of production processes, reports, activities and culmination (presentation/test/presentation). Learners declared competent if it meets the minimum standards required by the performance criteria of each basic competence. Determination achievement trial participants based on the value of the lowest value of basic competence in a unit of competency test.

**RESEARCH METHODS**

This study was a research & development (research & development). According to Borg (1989), in the implementation of development research is an attempt to develop or produce and validate a production that is used in learning. Stages of the development of this research using starting from Analysis, Design, Development, Implementation (ADDI).

This study was limited to the implementation of product-based entrepreneurship module, the implementation is to look at learning outcomes of the implementation of good product based entrepreneurship modules of cognitive, affective and psychomotor.

The procedure of this development can be seen in the following figure. A more detailed description of the procedures described in the following development.

The analysis was conducted to identify possible trouble in entrepreneurial learning through field surveys and literature studies. The analysis includes the analysis of needs such as analysis of curriculum and student analysis. The results of this analysis can be used to develop products based entrepreneurship modules.

Modules should be developed on the basis of the results of the analysis of needs and conditions. Keep in mind the material definitely learn what needs to be compiled into a module, how the number of modules required, who is going to use, what resources are needed and have been available to support the use of modules, and other things are considered necessary. Furthermore, the design of the modules developed is considered the most appropriate to the various data and objective information obtained from analysis of requirements and conditions. The shape, structure and component modules like what it can meet the various needs and conditions.

Establishing designs. Design by Hamalik (2008) is "an indication that gives basic, direction, goals, and techniques adopted in initiating and carrying out an activity". The

position of design in the development of the module is as one of the components of the underlying principles of development and provides direction techniques and the different stages of the module.

This phase verifies the form of troubleshooting to be performed and determine the appropriate test methods. This phase includes the translation needs and learning goals into objectives based entrepreneurship module manufacturing specific products. This stage entrepreneurship module-based design products according to the needs analysis conducted. Moreover, at this stage was also designed instruments to perform validation instrument production.

Based on a design that has been developed, compiled module required. The process of drafting module consists of three main stages. First, define strategies for learning and teaching the appropriate media. At this stage, to consider various characteristics of competencies that will be studied, characteristics of learners, and the characteristics of the context and circumstances in which the module will be used. Second, produce or physically embody module. Components of the module include learning objectives, learner pre requisites necessary, the substance or study materials, forms of learning and supporting components. The third was developing assessment tools. In this regard, it should be taken to ensure that all aspects of competencies (knowledge, skills, and attitudes related) can be assessed on the basis of certain criteria that have been set.

Furthermore, this development stage to generate and validate entrepreneurial learning modules based products. The validation process is accompanied by discussions or interviews with experts on the improvements to be conducted. Rancangan entrepreneurial learning modules based products prior consultation with an expert or experts and counselors. Then, the draft is considered by people who are competent (validator) who have understood the principle of the development of entrepreneurial learning modules based products, namely the engineering faculty lecturer and lecturer in entrepreneurship. Validation of this module there are three kinds, namely (1) validation of the module, is whether the modules that have been designed according to the course syllabus, (2) validity module format, the suitability of the components of the module with the elements that have been defined, (3) the validity of the presentation, the validity of which is associated with the use of language, writing, drawing, and the appearance in the manufacture of learning media.

A module that has been produced is then used/implemented in the learning activities. Learning activities carried out in accordance with the grooves that have been outlined in the module. Learning activities ended with the assessment of learning outcomes. Implementation of measures also follows the rules that have been formulated in modules.

The implementation phase was done by preparing the learning environment and student involvement in the preparation of lectures consisting of faculty and students. Students were given a product based entrepreneurship module to determine the learning outcomes of the module use.

Design implementation lectures using one group pretest-posttest. The pretest was given at the beginning of the lecture. Posttest granted at the end of lectures.

Table 1. One Group Pretest – Posttest Design

| Pretest | Treatment | Posttest |
|---|---|---|
| Q1 | X | Q2 |

Source: (Sugiyono, 2014)
Description:
Q1 : Initial tests (pretest) prior to the treatment given
X : The treatment of the group that is learning to use the Product-Based Entrepreneurship Module
Q2 : Final Test (posttest) after the treatment was given

**Technique of Data Analysis**

Analysis learning outcomes of the implementation of the product-based entrepreneurship module consisted of:

***Cognitive Aspects of Learning Outcomes***

Learning outcomes used to measure cognitive learning outcome gained from providing test questions to students before and after learning by using product-based entrepreneurship module in the form of entrepreneurship multiple choice test.

***Learning Outcomes Affective Aspects of***

Learning outcomes in the affective aspects derived from the measurement results against established criteria.

Table 2. Indicators attitude

| No. | Attitude Indicator |
|---|---|
| 1 | Implementing the SOP and K3 |
| 2 | Honesty |
| 3 | Discipline |
| 4 | Persistence |
| 5 | Cooperation |
| 6 | Innovative |
| 7 | Inquiry |
| 8 | Responsibility |
| 9 | Keeping the workplace |

***Aspects Psychomotor Learning Outcomes***

Results of a study on psychomotor aspects can be seen from the results observations of events and activities in which students work and an assessment of the product/ tool designed student. The psychomotor assessment categories on the product/tool produced on entrepreneurship learning by using module-based products can be seen in Table 3.

Besides using descriptive analysis was used to analyze statistical data by describing or represents data that has been collected as without meaning make conclusions or generalizations apply to the public (Sugiyono, 2013). This descriptive analysis aims to provide an overview of entrepreneurial learning conditions in the faculty of engineering in higher education.

## RESULTS AND DISCUSSION

Entrepreneurship courses held in the form of theoretical and practical so that it can be used as a future capital of students after graduation. Entrepreneurial learning is a process of enhancing the entrepreneurial spirit of students by using a variety of methods appropriate to the capabilities provided. Moreover, entrepreneurial learning is an educational process that serves to guide students in a systematic and targeted in order to foster entrepreneurship.

Noting the particular characteristics of the learning process of learning a unique and comprehensive entrepreneurship, entrepreneurship module development potential based products to meet the demands of the learning. "Module-based products can be directed learners in systematic work procedures and standards to make or complete a product (or service), through the production process/the real work" (BSNP, 2008).

The excess module is a product-based support existing teaching materials, provide an opportunity for students doing work practices oriented to the market, and to improve the competence of students as well as to foster the entrepreneurial spirit of students. In addition to the unavailability of products based modules on entrepreneurship courses.

Table 3. Indicators of psychomotor

| No | **Aspects** | **Description** | **Score** |
|---|---|---|---|
| 1 | Planning | Loading topics, objectives, materials/tools, work steps, schedule, time, approximate data to be acquired, the implementation of the project, a list of questions or the format used according to the purpose. | 20 |
| 2 | Gathering of data | a. Data information recorded with a neat, clear and complete.<br>b. The accuracy using a tool/material | 15 |
| 3 | Data processing | a. There is a classification of data, interpretation of data in accordance with the purpose of implementation of the work.<br>b. There is a description of the implementation work. | 15 |
| 4 | Reports | Formulate a topic, formulate the goals, writing tools and materials, outlines how to work (operational measures)<br>Systematically report writing, using communicative language.<br>Presentation of data is complete, contains conclusions and suggestions. | 20 |
| 5 | Products / tool's | Success in the construction and installation of the circuit in the instrument neatness. | 30 |
| | | Total Score | 100 |

This learning module development process is done with 5 stages of development as in the model used is the ADDIE development model consists of five main stages, namely, analysis (analysis), design (design), develop (development), and Evaluate (evaluation).

The analysis carried out through several activities, namely the analysis of curriculum and student analysis. This stage was conducted as a basis for developing a product based entrepreneurship module on entrepreneurship courses that can be used to facilitate self-learning students. After conducting the analysis phase, there was obtained product based learning entrepreneur module that presents 9 learning topics. Each topic interconnections that will direct students produce a product that can foster the entrepreneurial spirit of the students.

Research on the development of learning modules (Pebruanti & Munadi, 2015) and entrepreneurial learning modules in vocational education (Anggraini & Sukardi, 2015; Anggraini & Sukardi, 2016; Prasetya, & Sukardi. 2016). However, the development of products based entrepreneurship modules in vocational higher education was never produced and applied. The module was developed in accordance with the curriculum of courses for students of Faculty of Engineering Entrepreneurship in Higher Education.

**Students' Learning Outcomes**

Measuring the improvement of learning outcomes on cognitive aspects obtained was by providing test questions to students before and after the learning using entrepreneurship module-based products in the form of a multiple choice test. In the aspect of affective and psychomotor, learning outcomes obtained through an assessment by the observer (lecturer) in accordance with the indicators assessed as attitude, skills, and products produced by students when learning activities practice take place, well before using modules with after using module-based entrepreneurship product.

***Before using Learning Module-Based Enterprise Products***

***a. Learning Outcomes Cognitive Aspect***

Referring to the cognitive aspects of learning outcomes before using the product based entrepreneurship module on entrepreneurship courses showed that student results, amounting to 31 had an average of 66 learning outcomes, including the category is quite effective. The data on student results before using the product based entrepreneurship module.

Table 4. Percentage Cognitive Aspects of Learning Outcomes Before Using the Module

| No | Value Range | Frequency | In% | Category |
|---|---|---|---|---|
| 1 | 0-54 | 5 | 16.13 | Not effective |
| 2 | 55-64 | 6 | 19.35 | Less effective |
| 3 | 65-79 | 18 | 58.06 | Effective enough |
| 4 | 80-89 | 2 | 6.45 | effective |
| Total | | 31 | 100 | |
| average result of learning outcomes = 66 | | | | Self-effective |

It can be seen students who score sufficiently effective category or ≥ 65 numbered only 18 people and got effective category values ≥ 80 only accounts for 2 people. Based on learning outcomes data before using module-based products, we can conclude that learning-based module product before use is quite effective.

***b. The Learning Outcomes of Psychomotor Learning and Affective Aspects***

Assessment results of psychomotor and affective were seen through the observation by the observer on aspects of skills and attitudes current practice activities underway. Psychomotor aspects are skills students during practical learning activities take place. The preliminary stage was the preparation of tools and materials. Observations at the implementation stage, among others, work in groups, using the tool, dexterity, cleanliness, and others. Meanwhile, observations in the closing stages were on aspects of the observations recorded correctly, demonstrating the results of lab work, as well as the equipment used to clean back.

On the affective aspects are observed, among others, honesty, self-discipline, rigor, perseverance, friendship, innovation, responsibility and enthusiasm in the learning process. Social attitudes include work together in groups; appreciate lecturers and friends, as well as interaction with professors and friends. For data assessment psychomotor and affective aspects of students after calculated before

using the product based entrepreneurship module.

Table 5. Percentage of Psychomotor Learning and Affective Aspects Before Using the Module

| No | Range Value | Frequency | In% | Category |
|---|---|---|---|---|
| 1 | 65-79 | 19 | 61.3 | Sufficiently effective |
| 2 | 80-89 | 12 | 38.7 | Effective |
| Total | | 31 | 100 | |
| average result of learning outcomes = 78, 5 | | | | Self-effective |

Data from student results on the psychomotor and affective towards practical learning electronic circuit shows the results are quite effective. The average student is quite skilled in psychomotor activity required in a practical learning. But the skill that is not controlled perfectly by students is less nimble students using the tools and assembling electronic components. As well as on the affective lack of discipline, rigor, perseverance, and enthusiasm of students in the learning process.

***Learning after implementing Product Based Learning Module-Based***

***a. Cognitive Aspects of Learning Outcomes***

Referring to test results after using products based entrepreneurship modules in the course of practice shows that the electronic circuits student results, amounting to 31 had an average of 85 learning outcomes, including effective category.

Table 6. Percentage of Cognitive Learning ModuleAfter Using

| No | Range Value | Frequency | In% | Category |
|---|---|---|---|---|
| 1 | 65-79 | 5 | 16.13 | Effective enough |
| 2 | 80-89 | 17 | 54.83 | Effective |
| 3 | 90-100 | 9 | 29.03 | Very Effective |
| Total | | 31 | 100 | |
| average result of learning outcomes = 85 | | | | effective |

It can be seen students who score sufficiently effective category or ≥ 65 amounted to only 5 people and got effective value ≥ 80 categories totaling 17 people then who score highly effective category ≥ 90 amounted to 9 people. Based on data outcomes after using the product based entrepreneurship module, we can conclude that after using the learning modules based entrepreneurship effective product.

***b. The Learning Outcomes of psychomotor and affective Aspects***

Assessment results on psychomotor and affective can be seen through the observation by the observer on aspects of skills and attitudes current practice activities underway using product based learning module. The assessment which includes skills, attitudes, conformity of products/services, and the suitability of the execution time integrated components: preparation of proposals, the implementation of production processes, reports, activities and culmination (presentation/test/ presentation).

Table 7. Percentage of Psychomotor Learning and Affective Aspects After Using product based Entrepreneur learning module

| No | Range Value | Frequency | in% | Category |
|---|---|---|---|---|
| 1 | 80-89 | 1 | 3.2 | Effective |
| 2 | 90-100 | 30 | 96.8 | Very effective |
| amount of | | 31 | 100 | |
| average result of learning outcomes = 95 | | | | highly effective |

Based on student learning outcomes in psychomotor and affective to entrepreneurial learning, it showed very effective results. The average student is skilled in psychomotor activity required in a practical learning. Rating is the highest located on the dexterity of the students using the tools and assembling electronic components so as to produce a product/ tool suite has commercial potential. And also in the affective domain of students showed discipline, rigor, perseverance, and very enthusiastic students in the learning process by using a product based Entrepreneur learning module.

Based on the analysis and description have been done on the effectiveness of the two item indicators showed that the activity of the students while performing in the entrepreneur learning by using product based Entrepreneur learning module, that is in the active category and student results on the was good at cognitive aspects, while affective and psychomotor aspects were in the effective category. These results have provided the conclu-

sion that product based Entrepreneur learning module on the criteria the products are effective for use in the entrepreneurship courses.

**Discussion**

Learning outcomes test is used to determine the effectiveness of the learning process. The learning result is the ability of the students as they go through the process of learning experiences. The learning experience effective form of learning activity and can realize the goal of good learning outcomes. The purpose of the assessment of learning outcomes is to measure what level of success of the learning process that has been implemented.

From the description above shows that the use of modules developed easier for students to understand the material so that student learning outcomes for the better. Like what is proposed by Rashid & Mansour (2007) "the evaluation is the process of determining the extent to which the learning process has been achieved". Based on cognitive aspects of learning outcomes for entrepreneurial learning data indicates that of the 31 students who take the test before they use entrepreneurship module-based products have an average of learning outcomes are 66, with a category quite effective. The average results of student learning in psychomotor and affective aspects of 31 students before using the module are 78.5 with a category quite effective.

Based on data from the cognitive learning of the 31 students who took the tests after they use entrepreneurship module-based products have an average of learning outcomes at 85, including effective category. Likewise, student learning outcomes assessment in psychomotor and affective aspects have an average of learning outcomes, of 95, is included in the category of very effective. This shows that an increase in student results before and after using the product based entrepreneurship learning module. So, it can be concluded that learning by using modules can be said to be effective in improving student learning outcomes either on cognitive, psychomotor and affective.

Despite the many advantages obtained through the use of product based entrepreneurship learning module but the obstacles that need attention i.e. time management.

**CONCLUSIONS**

Based on these results it can be concluded as follows:

1. Research development of product based entrepreneurship learning modules developed using ADDI stages, limited at the implementation stage.
2. Learning by using product based entrepreneurship learning module can improve student learning outcomes in vocational higher education.
3. Product based entrepreneurship learning module has advantages over the module in general, one that is very important is this product based entrepreneurship learning module, it means the module that guides learners are able to produce products oriented to the needs of society and the business industry. In addition, products made extremely have commercial potential that vocational scientific competence of each student can be directly applied in entrepreneurial learning activities in this module.

Furthermore, based on the results of this study suggested activities to faculty, students, and vocational higher education in order to develop and use product based entrepreneurship learning module. In addition, the researchers can serve this research product as a reference and the development of advanced research.

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# THE EFFECT OF INDUSTRIAL WORK PRACTICE, GUIDANCE INTENSITY OF INDUSTRIAL SIDE, AND VOCATIONAL COMPETENCE ON WORKING READINESS OF GRADE XII STUDENTS OF BANKING PROGRAM, VOCATIONAL HIGH SCHOOL PERBANKAN, PEKANBARU

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Abstract

*This study aimed to find out the effect of: (1) industrial work practice, (2)guidance intensity of industrial side, (3)vocational competence, and (4) industrial work practice,guidance intensity of industrial side, and vocational competence on the working readiness of students of Vocational High School (VHS) PerBankan Pekanbaru. This research was ex-post facto research. The population was all students of class XII Program of Banking in the academic year of 2017/2018 which comprised 106 students who followed industrial work practice. A sample of 83 students was processed using the Proportional Random sampling technique. Prior to doing research, the instrument first validated the expert. After validated experts tested the validity and reliability to determine the valid and reliable instrument items. Data analyst technique used is descriptive research method, prerequisite test, and regression analysis. The results showed that: (1) industrial work practice ($x_1$) has a positive and significant effect on students'working experience (y) evidenced by $t_{hitung} \geq t_{tabel}$ (2,414 > 1,98) contribution of 27,63%; (2) the guidance intensity of industrial side ($x_2$) had a positive and significant effect on students'working readiness (y) evidenced by $t_{hitung} \geq t_{tabel}$ (2,822 > 1,98) contribution of 21,03%; (3) vocational competence ($x_3$) had a positive and significant effect on students'working readiness (y) evidenced by $t_{hitung} \geq t_{tabel}$ (2,348 > 1,98) contribution of 2,46%; (4) industrial work practice, guidance intensity of industrial side, and vocational competence simultaneously had a positive effect on students'working readiness (y) evidenced by $F_{hitung} \geq F_{tabel}$(16,235 > 3,11) with contribution of 51,12%. The rest 48,88% was determined by other factors.*

***Keywords**: industrial work practice, guidance intensity of industrial side, vocational competence, students working readiness*

## INTRODUCTION

Education is one of the important aspects of the progress of the State. Advanced education will produce intelligent and skilled people. The statement is in line with the definition of education in Law No. 20 of 2003 on National Education System (Department of National Education, 2003):

> *"Education is a planned conscious effort to create an atmosphere of teaching and learning process so that learners actively develop their potential to have spiritual power, self-control, personality, intelligence, noble character, and skills needed by students, society, nation and state."*

Nowadays, educational programs are directed to develop skills for learners. Schools, teachers and other stakeholders are expected to provide facilities to support students' skills. Vocational High School is a School that is designed to develop the skills of students as one of the institutions that are obliged by the government to prepare its graduates to work in some industrials. As stated in the explanation of Law Number 20 of 2003 on the National Education System (UUSPN No. 20 of 2003) that vocational education is an education that prepares students to be able to work in a particular field. Thus, vocational education serves as a means of preparation to work in some industrials. The implementation of education in vocational School is always adjusted to the conditions and needs of industrial. But data obtained from the Central Bureau of Statistics (CBS) released the number of unemployed in Indonesia of a August 2017 reached 7.04 million people. This number increased 10 thousand people compared to August 2016. Meanwhile, the Open Unemployment Rate (OUR) reached 5.50%. Of the 5.50% OUR, the highest unemployment is a graduate of Vocational High School with a percentage of 11.41%.In brief, the percentage increased compared to August 2016 which only reached 11.11% (Murdaningsing, 2017).

According to Nore & Lahn (2014) in the debates about vocational education and training (VET), the interaction between School and work is a recurrent theme. The purpose of Vocational High School is to prepare graduates ready to enter the world of work or industrial. One of the most accepted departments of the labor market is banking. The banking is one of the most wanted job by job seekers in Indonesia. People with a variety of educational backgrounds also apply for jobs in the Bank.

Working readiness is an ability that indicates coordination between the factors that influence it must be owned by someone to achieve the goal to be able to work immediately after graduation without requiring a period of adjustment takes a long time. Student readiness is influenced by internal factors that come from the students themselves include maturity both physical and mental, pressure, creativity, interest, talent, intelligence, independence, mastery of science, and motivation. Other factors are external factors that come from outside the students themselves include the role of society, families, facilities and infrastructure Schools, information about industrials, and work experience. Students are said to be ready to work, if they have optimal maturity and intelligence. But in real circumstances, not all vocational students have optimal maturity and intelligence that can support them in preparing themselves to work in famous industrials. Therefore, Vocational High School held a learning program that can support graduates who are ready to work in some industrials is called called internships. The internship program aims to enable students to directly apply their skills in industrials (Tamrin, Slamet, & Soenarto, 2018). The apprentice system in Germany is called Dual System or Multiple System Education because it combines job training with theories taught in School one or two days per week (Petrosky, 2). Deissinger (2010) suggested Dual System can be applied by giving training and vocational education in full time in partner institutions. The main purpose of dual system is to produce skilled workers, qualified, have flexible working ability according to their field.

One of the efforts to improve the quality and relevance of vocational education is the enhancement of *link and match*. Dual system education which is based on *link and match policy* expect vocational education competence will be implemented in two places. Some educational competencies are carried out in the School, namely vocational theories and basic practices, and some are implement-

ed in the workplace such as productive skills gained through learning by doing (Mardiyah & Supriyadi, 2013). According to Supriadi (2002), *link and match* can provide implications for human resource, future, quality and excellence, professionalism, value-added and economic insight in the organization of vocational education. Based on the above description, it can be stated that the implementation of Dual System Education emphasizes the integration of education in Schools with education obtained in the company. Dual System Education provides an efficient way of producing high graduates in technology (Göhringer, 2002).

Industrial work practice is an activity between Vocational High School and industry as part of Dual System Education. It is a productive skills activity carried out by the vocational School students in the business world / industrial world that has the aim of improving the ability of the learners (Prasetyo, 2013). Dikmenjur (2008) suggested that it is a concrete manifestation of Dual System Education in which the learning program implemented by learners is done in the world of work. In brief it is a productive skills program implemented by Vocational School students in some industrials as part of Dual System Program.

The students shoud get any guidances industrial work practice. The word "intensity" comes from English (Echols & Shadily, 2014, p. 326). In the Great Indonesian Dictionary of the Ministry of National Education (Departemen Pendidikan Nasional, 2008, p. 506) intensity is defined as "its state, level, and intense measure". Intensity is the unanimity of effort mobilized for a business. So the intensity is the amount of effort and sincerity done by someone in doing certain activities. Meanwhile, the word guidance is derived from the verb "to guide" (Hallen, 2002, p. 3). In short the intensity of guidance can be interpreted the number of efforts and seriousness done by a person in performing a psychological process of assistance in the form of knowledge, understanding and certain competencies to help individuals or groups in order to develop the capabilities students have. Consequently,the students should be able to develop their ability such as money calculations, registration, operation of the work equipment (computer, scanning equipment, etc.), opening new customer accounts, documentation and other works related to all Bank activities and other financial services.

One of educational backgrounds is the competence or expertise possessed, both from School education and industrial work practice. Spencer stated that competence is as a basic characteristic possessed by an individual who deals causally in meeting the criteria required to occupy a position (Palan, 2007). Competence consists of 5 (five) types of characteristics: motives (consistent willingness as well as the cause of action), innate factors (character and consistent response), self concept (self-image), knowledge (information in a particular field) and skills to perform the task). Government Regulation (PP) Law No. 23 of 2004 (Presiden Republik Indonesia, 2004) on the National Agency for Professional Certification (BNSP) describes the certification of work competence as a process of awarding competency certificates that are conducted systematically and objectively through competency tests referring to the national and international work competency standards. Pavlova (2010, p. 9) states about the competencies defined as follows:

> *"The definition of competence adopted by the committee recognized that performance is underpinned not only by skill, but also by knowledge and understanding, and they involve both the ability to perform in a given context and the capacity to transfer knowledge and skills to new tasks and situations."*

From the definition above, it can be interpreted that vocational competence in the wider scope is not only limited to the ability but also related to the profile of the attitude, mental and understanding of a person in carrying out his work or in other words the value of competency in hard skill and soft skills. Vocational competence also relates to the contribution that an individual professional can make to a better economic change.

Based on Decree of Director General of Primary and Secondary Education Number: 330/D.D5/KEP/KR/2017 the banking program has Core Competence and Basic Competence as follows: (1) Communication competence (2) money calculation competence (3) competence in doing transaction in the bank (4) competence of office equipment use (5) cor-

respondence competence (6) administrative competence and accounting (7) competence in managing service and trade accounting cycles (8) competence to manage the Cash of Banks and Small Cash (9) competence to operate the processing of numbers (10) documentation competence.

Referring to the above descriptions, the purpose of this study is to determine the level of each variable and to know the influence (1) industrial work practice; (2) guidance intensity of industrial side; (3) vocational competence; (4) guidance intensity of industrial side, and students' vocational competencies stimultanouly on the working readiness of the students of banking ofVocational High School Perbankan Pekanbaru.

## RESEARCH METHOD

This research is an ex-post facto research. It research is a study in which independent variables have occurred when the researcher began with observation of dependent variables in a study. Ex-post facto research was chosen to find the effect of independent variables on dependent variable. This research was conducted to find the influence of industrial work practice, guidance intensity of industrial side, and vocational competence on the readiness of students' work. This research includes descriptive research with quantitative approach.

This research was conducted in Vocational High School Perbankan in Pekanbaru: Vocationah High Schol of Perbankan Riau which is located on Jl. Majalengka, Sidomulyo Tim., Marpoyan Damai, Kota Pekanbaru, Riau and Vocational High School of IT Al-Izhar School Perbankan Syariah which is located on Jl.HR.Soebrantas Km.15. It was carried out from January 2018 involving observation, instrument making, data collection and research report.

The population of this research was taken from all of twelveth graders of Banking Program of Banking Vocational High Schools Pekanbaru academic year 2017/2018. The total of population was 106 which wastaken from 73 students of Vocationah High School Perbankan Riau and 33 students of Vocational High School of IT Al-Izhar School Perbankan Syariah. They were chosen as population of this research because they had industrial work practice experience. Besides, they had prior knowledge about banking.

The sample was taken using (Isaac & Michael (1983, p. 192) formula:

$$s = \frac{X^2\, NP\,(1-P)}{d^2(N-1) + X^2\,.P(1-P)}$$

The sample technique used in this research is *Propotional Random Sampling.* The sample is taken proportionally based on number of students of each School using the following formula:

$$s = \frac{n}{N} x\, S$$

In this research, documentation and closed questionnaire method was used. Documenation was used to measure independent variables: Vocational Competence, in which the data were taken from semester one report result of grade twelve of 2017//2018 and students' practical industrial work' scores of Banking Program in Pekanbaru Academic Year 2016/2017.

Questionnaire was used to obtain data about the experience of industrial work practice, guidance intensity of industrial side and the readiness of the students of class XII of Vocatioan High School Perbankan in the academic year 2017/2018. A written questionnaire was given to the respondentsusing Likert scale with four alternative answers are as follows: strongly agree, agree, disagree, and strongly disagree.

The technique used was descriptive analysis, test of precondition analysis, multiple regression hypotheses. In the descriptive analysis, table, chart, diagram, mean, modus, median, and standard deviation are presented. Before data analysis was done, precondition analysis test was conducted: (1) normality test, (2) linearity test, and (3) multicolinearity test.

Multiple regression analysis is used to determine the state of the dependent variable if the predictor value of the independent variable is manipulated. The magnitude of the influence of industrial work practice (X1), the magnitude of intencity guidance of industrial side (X2), and the variability of vocational competencies (X3) that can be varied which is used to predict students' work readiness (Y). The equations used is:

$$Y = a + b1\, X_1 + b2\, X_2 + b3\, X_3$$

## RESEARCH FINDINGS AND DISCUSSION

### Research Findings

Precondition analysis test consits of normality test, linearity test, and multicolinieality test.

### Normality Test

Normality test was conducted using *SPSS 20 for windows.* The results of the test are presented in table 1. Normality test using KolmogorovSmirnov is normally distributed if Asymp. Sig (2 tailed) value > 0,05 at level significant (α).

Table 1. The results of Normality Test

| Variable | Asymp. Sig. | Criterion | Result |
|---|---|---|---|
| Industrial Work Practice | 0,350 | > 0,05 | Normally Distributed |
| Guidance Intensity of Industrial Side | 0,980 | | Normally Distributed |
| Vocatioanal Competence | 0,110 | | Normally Distributed |
| Students' Working Readiness | 0,518 | | Normally Distributed |

Normality test using Kolmogorov-Smirnov indicates that Asymp. Sig (2 tailed) value for Industrial Work Practice is 0,350 > 0,05 at level significant (α), Asymp. Sig (2 tailed) value for Guidance Intensity of Industrial Side is 0,0980> 0,05 at level significant (α), Asymp. Sig (2 tailed) value for Vocational Competence is 0,110> 0,05 at level significant (α), and Asymp. Sig (2 tailed) value for Students' Working Readiness is 0,518> 0,05 at level significant (α). In brief, all the variable data are normally distributed.

### Linearity Test

Linearity was done using *SPSS 20.0 for windows.*

Table 2. The Results of Linearity Test

| Variable | Sig. | Criterion | Result |
|---|---|---|---|
| Industrial Work Practice | 0,689 | > 0,05 | Linier |
| Guidance Intensity of Industrial Side | 0,476 | | Linier |
| Vocatioanal Competence | 0,152 | | Linier |

Based on Table 2, it is clearly displayed that significance value on *deviation from liniearity* of the Industrial Work Practice ($X_1$) and Students' Working Readiness Variable (Y) is 0,689 > 0,05. It indicates that the relationship between the two variables are linear. The significance value on *deviation from liniearity* of the Guidance Intesity of Industrial Side ($X_2$) and Students' Working Readiness Variable (y) is 0,475 > 0,05. It indicates that the relationship between the two variables are linear. The significance value on *deviation from liniearity* of the Vocational Competence ($X_3$) and Students' Working Readiness Variable (y) is 0,152 > 0,05. It indicates that the relationship between the two variables are linear.

### Multicolinearity Test

The results of linearity test was performed using *SPSS 20,0 for Windows* which are presented in table 3. The multicolinearity test was conducted using *Variance Inflation Factor* (VIF) technique .

Table 3. The Results of Multicolinearity Test

| Variable | Tolerance | Crite-reon | VIF | Crite-reon | Result |
|---|---|---|---|---|---|
| Industrial Work Practice | 0,567 | > 0,1 | 1,764 | < 10 | Multicolinearity doesn't occur |
| Guidance Intensity of Industrial Side | 0,572 | | 1,750 | | Multicolinearity doesn't occur |
| Vocatioanal Competence | 0,985 | | 1,015 | | Multicolinearity doesn't occur |

Multicolinearity doesn't occur if coefisien (r) inter dependent variable is lower or equal 0,60 (r ≤ 0,60). On the other sides, multicolinearity occurs if α counted > α and VIF counted < VIF. *Tolerance* (α) of this test is 10%, so that α counted must be higher than 10% (0,1) and VIF counted must be lower than 10.

The results of the multicolinearity test using SPSS 20.0 for Windows explains that: the tolerance value of the Industrial Work Practice (X1) is 0,567 > 0,1and VIF value is 1,764 < 10. Thus, multicolinearity doesn' occur. the tolerance value of Guidance Inten-

sity of Industrial Side (X2) is 0,572 > 0,1and VIF value is 1,750 < 10. It indicates that multicolinearity doesn' occur. the tolerance value of Vocational Competence (X3) is 0,985 > 0,1 and VIF value is 1,015 < 10. It indicates that multicolinearity doesn' occur.

**Hypothesis Test**

***First Hypothesis Test***

The first hypothesis of this research is the effect of industrial work practice on students' working readiness.This hypothesis was done by looking at the value of $t_{obtained}$ and $t_{table}$ for 83 samples with sig < 5% (0,05). If $t_{obained}$ is higher than $t_{table}$, Ho is rejected and Ha is accepted.

Table 4. The Results of Multiple Regression for the First Hypothesis

| Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|
| B | Std. Error | Beta | | |
| .291 | .121 | .284 | 2.414 | .018 |

Table 4 demonstrates that the value of $t_{obained}$ > $t_{table}$ (2,414 > 1,98) at significance level 5% with p value is 0,05. It shows that Ha is accepted and Ho is rejected. In short, industrial work practice had a significant effect on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academich year 2017/2018.

***Second Hypothesis Test***

The second hypothesis of this research is the effect of guidance intensity of industrial side on students' working readiness.This hypothesis was done by looking at the value of $t_{obtained}$ and $t_{table}$ for 83 samples with sig < 5% (0,05). If $t_{obained}$ is higher than $t_{table}$, Ho is rejected and Ha is accepted.

Table 5. The Results of Multiple Regression for the Second Hypothesis

| Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|
| B | Std. Error | Beta | | |
| .209 | .074 | .330 | 2.822 | .006 |

Table 5 displays that the value of $t_{obained}$ > $t_{table}$ (2,822 > 1,98) at significance level 5% with p value is 0,05. It shows that Ha is accepted and Ho is rejected. In brief, the guidance intensity of industrial side had a significant effect on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academich year 2017/2018.

***Third Hypothesis Test***

The third hypothesis of this research is the effect of vocational competence on students' working readiness. This hypothesis was done by looking at the value of $t_{obtained}$ and $t_{table}$ for 83 samples with sig < 5% (0,05). If $t_{obained}$ is higher than $t_{table}$, Ho is rejected and Ha is accepted.

Table 6. The Results of Multiple Regression for Third Hypothesis

| Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|
| B | Std. Error | Beta | | |
| .346 | .147 | .209 | 2.348 | .021 |

Table 6 clearly shows that the value of $t_{obained}$ > $t_{table}$ (2,348 > 1,98) at significance level 5% with p value is 0,05. It means that Ha is accepted and Ho is rejected. In brief, the vocational competence had a significant effect on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academich year 2017/2018.

***Forth Hypothesis Test***

The forth hypothesis of this research is the effect of industrial work practice, guidance intensity of industrial side, and vocational competence on students' working readiness. This hypothesis was tested uisng multiple regression analysis and further processed using *SPSS 20.0 for Windows*. If $t_{obtained}$ is higher than $t_{table}$ for 83 samples at significant level 5% (0,05), Ho is rejected and Ha is accepted.

Table 7. The Results of Multiple Regression for Forth Hypothesis

| r (correlation) | $r^2$ (determination) | F | Sig | Conclusion |
|---|---|---|---|---|
| 0,618 | 0,381 | 16,235 | .015[b] | Significant |

The analysis results using *SPSS 20,0 for Windows* show that $F_{obtained} > F_{table}$ (16,235 > 3,11) and $\alpha_{obtained} < \alpha_i$ (0,015 < 0,05). It means Ha is accepted and Ho is rejected. In conclusion, industrial work practice, guidance intensity of industrial side, and vocational competence simultanously had a significant effect on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academich year 2017/2018

**Relative and Effective Contribution**

Relative and effective contribution aims to find out contribution of every predictor variable on criterium. The calculation using *SPSS 20,0 for Windows* shows that industrial work practice ($X_1$) has coefisien value 0,291, guidance intensity of industrial side ($X_2$) has coefisien value 0,209, and vocational competence ($X_3$) has coefisien value 0,346. Therefore, the regression equation is as follows:

Y = 62,637 + 0,291X1 + 0,209X2 + 0,346X3

Note:
$X_1$ = Industrial Work Practice
$X_2$ = Guidance Intensity of Industrial Side
$X_3$ = Vocational Competence
Y = Students' Working Readiness

The constant value of this equation is 62,637. Thus, If industrial work practice ($X_1$), guidance intensity of industrial side ($X_2$), and vocational competence ($X_3$) is assumed 0, it means the students' working readiness (Y) is 62,637 points. The coefisien regression value of industrial work practice ($X_1$) is 0,291. The students' working readines (Y) will increase 0,291 point if industrial work practice variable ($X_1$) increases 1 point with an assumption that guidance intensity of industrial side variable ($X_2$), and vocational competence variable ($X_3$) are fixed. The coefisien regression value of guidance intensity of industrial side ($X_2$) is 0,209. The students' working readines (Y) will increase 0,209 point if guidance intensity of industrial side variable ($X_2$) increases 1 point with an assumption that industrial work practice variable variable ($X_1$), and vocational competence variable ($X_3$) are fixed. The coefisien regression value of vocational competence variable ($X_3$) is 0,346. The students' working readines (Y) will increase 0,346 point if vocational competence variable ($X_3$) increases 1 point with an assumption that industrial work practice variable variable ($X_1$), guidance intensity of industrial side variable ($X_2$) are fixed.

The relative contribution of industrial work practice ($X_1$) on students' working readiness (Y), guidance intensity of industrial side($X_2$) on students' working readiness (Y), and vocational competence ($X_3$) on students' working readiness (Y) are displayed in the following table.

Table 8. Coefisien Value b, Cross Product of Each Variable

| Variabel | B | ∑xy |
|---|---|---|
| Praktik Kerja Industri | 0,291 | 1794,169 |
| Intensitas Bimbingan Pihak Industri | 0,209 | 1900,952 |
| Kompetensi Kejuruan | 0,346 | 134,181 |

Based on Table 8, relative distribution of each variable can be calculated using the following formula.

$$JK_{reg} = a_1 \sum x_1 y + a_2 \sum x_2 y + a_3 \sum x_3 y$$
= (0,291 x 1794,169) + (0,209 x 1900,952) + (0,346 x 134,181)
= 522,1 + 397,3 + 46,4
= 965,8

$$SRx_1\% = \frac{a_1 \sum x_1 y}{JK_{reg}} x100\%$$
$$= \frac{522,1}{965,8} x100\%$$
= 57,39%

$$SRx_2\% = \frac{a_2 \sum x_2 y}{JK_{reg}} x100\%$$
$$= \frac{397,3}{965,8} x100\%$$
= 41,13%

$$SRx_3\% = \frac{a_3 \sum x_3 y}{JK_{reg}} x100\%$$
$$= \frac{46,4}{965,8} x100\%$$
= 1,48%

$SRx_1\% + SRx_2\% + SRx_3\%$ = 57,39% + 41,13% + 1,48% = 100%

Furthermore, the effective contribution of the independent variable of industrial work practice ($X_1$) to the dependent variable of students' working readiness (Y), effective contribution of independent variable of guidance intensity of industrial side ($X_2$) to the dependent variable of students' working

readiness (Y) and effective contribution of vocational competence independent variable ($X_3$) to the dependent variable of students' work readiness (Y) are calculated using the following formula.

$$SE\ X_1\% = (aX_1.\sum x_1y.R^2.100\%)$$
$$= (0{,}291.1794{,}169.0{,}381.100\%)$$
$$= 27{,}63\%$$

$$SE\ X_2\% = (aX_2.\sum x_2y.R^2.100\%)$$
$$= (0{,}209.1900{,}952.0{,}381.100\%)$$
$$= 21{,}03\%$$

$$SE\ X_3\% = (aX_3.\sum x_3y.R^2.100\%)$$
$$= (0{,}346.134{,}181.0{,}381.100\%)$$
$$= 2{,}46\%$$

$$SE\ Total\ \% = SE\ X_1\% + SE\ X_2\% + SE\ X_3\%$$
$$= 27{,}63\% + 21{,}03\% + 2{,}46\%$$
$$= 51{,}12\%$$

From the total of effective contribution (51,12%) can be described that industrial work practice variable ($X_1$) has effective contribution 27,63%, guidance intensity of industrial side varible ($X_2$) has effective contribution 21,03%, and vocational competence variable ($X_3$) has effective contribution 2,46%. The other unlimited variables in this research has effective contribution 48,88%.

**Discussion**

This discussion is delivered based on the research findings which is reffered to the following formulation of problem:

***The Effect of Industrial Work Practice ($X_1$) on Students' Working Readiness (Y).***

Students can get valuable knowledge and competence through industrial work practice. Competence persons are ones who have large knowledge and experiences related to their skills. Experiences, guidance, and competence can be obtained by actively taking part in the workplace. The experiences obtained in the workplace could give a significant effect on the students' work quality. The better work quality the better value can be obtained. At the same time, they also will be more ready to work.

The research findings indicate that there is a significant relationship among of the variables. It is found that $t_{obtained}$ is 5.554 which is bigger than $t_{table}$ (1.98) at significant level 5%. As the result, Ho is rejected and Ha is accepted. On the other words, there is a significant relationship between industrial work practice on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academic year 2017/2018. It means that the students will have higher working readiness if they seriously take part in the work place. Therefore, to prepare the stu-dents' working readiness, good industrial work practice is definitely required.

***The Effect of Guidance Intensity of Industrial Side ($X_2$) on Students' Working Readiness (Y)***

Guidance intensity of industrial side means the amount of guidance given to students in developing their skills. The guidance given has large influence on the students' knowledge. The students' work quality is absolutely influenced by knowledge obtained in the industrial. Therefore, the more guidance students get, the more they can learn from it. On the other words, the students' working readiness is also influenced by guidance intensity.

The research findings indicate that there is a significant relationship among of the variables. It is found that $t_{obtained}$ is 5.663 which is bigger than $t_{table}$ (1.98) at significant level 5%. As the result, Ho is rejected and Ha is accepted. On the other words, there is a significant relationship between guidance intensity of industrial side on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academic year 2017/2018.

This study also produces the same fact that the guidance given by the industry affects level of readiness of students' work. The data can be interpreted that the higher the intensity of the guidance of the industry, the higher the level of readiness of the students works. The low intensity of guidance given by in the industrial is caused by the unreadiness of the students. On the other words, they have lack of basic knowledge about industrial.

***The Effect of Vocational Competence ($X_3$) on Students' working Readiness (Y)***

Vocational competence were measured based on both semester one report results of twelveth graders in academic year 2017/2018 and students' practical industrial work' scores

of Banking Program in Pekanbaru Academic Year 2016/2017. The scores obtained can affect both the knowledge obtained either in theory or direct practice and improve the students' working readiness.

The research findings indicate that there is a significant relationship among of the variables. It is found that $t_{obtained}$ is 5.250 which is bigger than $t_{table}$ (1.98) at significant level 5%. As the result, Ho is rejected and Ha is accepted. On the other words, there is a significant relationship between vocationl competence on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academic year 2017/2018.

Based on the data, the students' competence is categorized to good. On the other words, they are ready to compete in some industrials. As the result, Industrial can select qualified or competence students who are ready to work from Vocational High School graduates.

***The Effect of Industrial Work Practice ($X_1$), Guidance Intensity of Industrial Side ($X_2$), and Vocational Competence ($X_3$) on Students' Working Readiness (Y)***

Based on the research findings, it is found that there is a significant relationship of industrial work practice, guidance intensity of industrial side, and vocational competence on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academic year 2017/2018. Based on F test, it is obtained that $F_{obtained} > F_{table}$ (16,235 > 3,11) and $\alpha_{obtained} < \alpha_i$ (0,015 < 0,05). It means Ha is accepted and Ho is rejected. In conclusion, industrial work practice, guidance intensity of industrial side, and vocational competence simultanously had a significant effect on the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru academich year 2017/2018

Industrial work practice, Guidance Intensity of Industrial Side, and Vocational Competence the working readiness of twelveth grade students' of banking program of Vocational High School Perbankan academic year 2017/2018 had correlation coefficient and determination 38.10%. As the result, it is possible that the Practice of Industrial work practice, Guidance Intensity of Industrial Side, and Vocational Competence could be used as prediction of students' working readiness. This effect was also reinforced by effective contribution 51.12% that can be explained that the variable of Industrial work practice ($X_1$) had an effective contribution 27.63%, Guidance Intensity of Industrial Side variable ($X_2$) had an effective contribution 21.03% and Vocational Competence ($X_3$) had an effective contribution 2.46%.

It means that, the students' working readiness would also increase if the implementation of industrial work practice carried out well which is supported by the Guidance Intensity of Industrial Side and vocational competence obtained in the form of knowledge and practice increased, Consequently the purpose of vocational education that create graduates to be capable for work will be achieved. Therefore, after the students have done industrial work practice, the students will get direct experience visually about how the real world of work, improve their skills, and provide confidence for students in preparing themselves to join with work world after their graduation from vocational high School. Hopefully, the main purpose of Vocational High School to create capable students to work is reached.

## CONCLUSIONS

Based on data analyses obtained, conclusions are drawn as follows:

First, the level of industrial work practice experience of the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru was categorized to *high* with everage score 57,27 which can be seen in interval $61,95 > X \geq 57,28$. Second, the levelve of guidance intensity of industrial side given to the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru was categorized to *low* with everage score 66,64 which can be seen in interval $66,64 > X \geq 59,08$.

Third, the level of vocational competence obtained by the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru was categorized to *good/competence* with everage score 89,17 which can be seen in interval 80-89. Fourth, The level of the working readiness of the

twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru was categorized to *low* with everage score 62,39 which can be seen in interval $62{,}39 > X \geq 57{,}60$.

Fifth, indusrial work practice had positive and significant effect on the working readiness of the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru. It is concluded based on effective contribution value was 27,63% and p value was 0,00. Sixth, guidance intensity of industrial side had positive and significant effect on the working readiness of the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru. It is concluded based on effective contribution value was 21,03%% and p value was 0,00.

Seventh, vocational competence had positive and significant effect on the working readiness of the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru. It is concluded based on effective contribution value was 2,46% and $t_{obtained}$ value > $t_{table}$ (2,348 > 1,98) at significant level 5% and p value was 0,00. Eighth, industrial work practice, guidance intensity of industrial side, vocationa competence simultanously had positive and significant effect on the working readiness of the twelveth grade students' of banking program of Vocational High School Perbankan Pekanbaru with contribution 51,12% and $R^2 = 0{,}381$ and nilai $F_{obtained} > F_{table}$ (16,235 > 1,98) at significant level 5% and p value was 0.00.

The suggestions that may be provided for this research are as follow:

First, to improve the quality of the implementation of industrial work practice the chief department of Banking expertise can convey to teachers competence in addition to science theory to master the techniques in the field of banking. The competency teacher of Banking is expected to perform guiding and supervision during the teaching practicum process. The contents of the general guidance of the material up to the practice of the students include the knowledge that students need in the industry and the necessary work practices after graduation to work in the workplace. In addition to the knowledge and practice teachers also provide materials related to the readiness of student work, among others: self-confidence, cooperation, quality of work, skills, initiative and creative and responsible.

Second, schools are expected to give clear guidance assessment to industrial in order that there is a common standard of assessment between industry. The Schools are expected to cooperate with some direct industrial which has been considered feasible for the implementation of industrial work practice so that it can be directly deployed to the workplace in accordance with the vocational program. The Schools are expected to better prepare students for taking part in the industrial so that it is easier to do guidance to students.

Third, industry is expected to provide good guidance to students who take part in the industrial work practice. By giving the list of tasks in the implementation of industrial work practice. Fouth, the School should improve the readiness of the students' work by providing training before conducting industrial work practice.

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# THE EVALUATION OF PROJECT-BASED LEARNING IN MALAYSIA: PROPOSE A NEW FRAMEWORK FOR POLYTECHNICS SYSTEM

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Abstract

*Technical and Vocational Education is one of the various discipline that believed could encourage the country's economic growth. Project-Based Learning or PBL was introduced in the Malaysian polytechnics curriculum in terms to produce creative and innovative graduates Thus, Project-Based Learning was introduced because of the ineffectiveness of the traditional lecture method. This study was a kind of descriptive study intended to examine the perception of students and supervisors regarding the Project-Based Learning at one Polytechnic in Malaysia. A population of 170 would be represented by a sample size of 118 respondents and 43 supervisors to participate in the study. The result found that the significant aspect to be included in Project-Based Learning is effective supervising skills. However, from the data, some supervisors have no proficiency skills of Project-Based Learning. Based on the empirical data which derived from the present study, a new framework for Project-Based Learning is suggested for the polytechnics system.*

**Keywords:** *project-based learning, polytechnics, evaluation*

## INTRODUCTION

Malaysia purposes to become the education hub in the region by 2015. Higher education sector has been a significant factor at the forefront in driving the nation's progress and development. This sector plays a key role in shifting Malaysia's position to become a high income economy by 2020. In terms of Higher Education Institutions as of October 2011, there are 20 public universities, 26 private universities, 23 private university colleges, 28 polytechnics, 74 community colleges, 434 private colleges and several branch campuses of foreign universities (www.moe.gov.my/). Technical and Vocational Education is one of the various discipline that believed could encourage the country's economic growth. Since 1969 when the first polytechnics, Ungku Omar was established, the polytechnics system in Malaysia has evolved. With 60,840 students in 2009 to 87,440 in 2012 (Wahab, Zakaria, & Jasmi, 2010), the polytechnics have expanded to become Malaysia's largest public tertiary TVE provider in this country. The demand for knowledge and skilled workers is growing due to the economic reality in 2020. High productivity and innovation are created by highly knowledgeable and innovative workforce – as evident in advanced countries such as the United States of America, Finland, Germany, South Korea and Japan. Thus, Project-Based Learning or PBL was introduced in the Malaysian polytechnics curriculum in terms to produce creative and innovative graduates. It is supposed that students by using PBL are actively involved in authentic inquiry, knowledge construction, autonomous learning, scaffolding, and proposing creative solutions (Chambers, Carbonaro, & Rex, 2007). Nevertheless, the present challenges facing polytechnics such as lack of innovative leadership, heavily centralized system, lack of PhD-qualified lecturers, poor R&D facilities, traditional pedagogies, heavy teaching workload, weak industrial linkages, inadequate funding and poor incentives (as compared to universities) may slow down the transformation pace (Wahab et al., 2010). PBL pressures on the knowledge construction derived from previous knowledge, experience, and interaction with the social environment. In addition, advocates assert that PBL arranges the students for the independent, critical thinking and effective teamwork skills as required in the real workplace (David, 2008). In the nutshell, Project-Based Learning was introduced because of the ineffectiveness of the traditional lecture method.

An effective learning, basically, aims to increase and involve students in explore and inquiry activities which contain solving problem tasks and critical thinking need. According to Schneider (2005) and Grant (2002), Project-Based Learning is an instructional approach that emphasizes student-centered learning by assigning project. Project that mean by producing a masterpiece of product was the result from investigation work. Furthermore, Project-Based learning is a pedagogical model that involves students in investigation of real-world problems that culminate in authentic products (Intel Teach Program, 2007). Thus, in appearance, Project-Based Learning tends to be the appropriate approach to nurture higher order thinking. The need of students' with 4C skills (creative, critical, communication and collaboration) has been affected the schools to implement a systematic learning methods. According to Buck Institute for Education (2011) and Lipson, Epstein, Bras, & Hodges, (2007), Project-Based Learning is a systematic teaching method that engages students in learning, real-world problem and life-enhancing skills through creative, scientific, authentic and challenging process. Project-Based Learning is a dynamic model that focuses on teaching by engaging students in higher order thinking. It is also a tangible model that requires real-world task, collaborative investigation, and the production of an artifact or a product (Blumenfeld et al., 1991).

In the traditional approach, teachers usually act as a source of knowledge. Teachers usually assume the students as information recipient. Thus, traditional method is more suitable for theoretical subjects but not for practical studies. In contrast, Project-Based Learning is an approach that transforms teaching from "teachers telling" to "students doing" (EL KAMOUN, Bousmah, & Aqqal, 2011). This learning approach is also suitable in special education. As special need children, they often lack of normal ability in learning. The exceptional children could use Project-Based

Learning to sharpen their mind-hands coordination (Guven & Duman, 2007). Finally, Project-Based Learning goals include: developing students' knowledge, improving students' problem solving skills, enhancing students' self-directed learning (SDL), promoting students' effective collaboration, and boosting students' intrinsic motivation (Hmelo-Silver, 2004).

Finally, the Project-Based Learning is significantly more effective that traditional method in terms to promote creative knowledge and skill of the students. In the nutshell, Project-Based Learning was introduced because of the ineffectiveness of traditional learning. It provides students with real-world learning, engages students' in investigation task, enhances students' inquiry process and produces a tangible artifact. Many teachers perceive Project-Based Learning was benefit for the students, it was believed that it would motivate the students beyond academic content (Bradley-Levine & Mosier, n.d.). However, Project-Based Learning or PBL, teaches students not only about the content but also important skills in ways students have to be able to function like adults in our society. Those important skill means were communication skills, organizational and time management skills, research and inquiry skills, self-assessment and reflection skills and critical thinking (Goodman, 2010).

Zimmerman (2012) summarizes the advantages of Project-Based Learning from the students' perspective: (1) project is relevant to student's life and personally meaningful; (2) project is an exploration into an authentic problem; (3) in project, students are having a voice in selecting the problem; (4) project is a learning strategy that encourages students to monitor their own progress; (5) project fulfills the curriculum objectives; (6) project begins with driving question, and (7) project encourages students to revise their research and to reflect on their progress.

In PBL, the involving of students and supervisors was important and crucial as project' participants. However, supervisors are responsible to monitor the adequacy of resources, information, learning contexts, project time, and tasks (Mergendoller & Thomas, 2000). PBL uses authentic content and purpose with a major emphasis on higher-order thinking and problem-solving. The role of the supervisors is to monitor the progress of the project. The supervisor should also facilitate the transfer of learning and to help the students who encounter problems while doing the project.

## RESEARCH METHOD

This study was a kind of descriptive study intended to examine the perception of students and supervisors regarding the Project-Based Learning at one Polytechnic in Malaysia. Specifically, this study utilized a case study method which focused on one polytechnic and to evaluate the effectiveness of "Project-Based Learning" approach in that polytechnic. Case study is widely used in organizational studies and across the social sciences (Cassell & Symon, 2004). The research design was based on the research objectives and the conceptual framework. The variables in this study were supervisors' readiness and students' problem solving skills.

### Population and Sample

The population for this research study were students and supervisors. The first population was final-project course (J5012) supervisors in the Mechanical Engineering Department in the selected polytechnic. The second population was final-year students who took the final-project course (J5012). In 2011, the selected polytechnic has 5,787 students with 374 academic staff and 74 non-academic staff. Specifically in 2012, 168 students registered for the final project (course J5012). Sample size was determined by using table of sample size by Krejcie & Morgan (1970). According to Krejcie and Morgan, a population of 170 would be represented by a sample size of 118 respondents. However, only 43 supervisors were willing to participate in the study.

### Data Collection

The present study was considered to gain inputs from the students and the supervisors regarding the effectiveness of Project-Based Learning at one of the polytechnics in Malaysia. However, this section study aimed to propose a new framework for polytechnic system in Malaysia. The instrument for this study consisted of a set of

questionnaire. The questionnaires were distributed during the class and the students were given 30 minutes to answer the questionnaires. The questionnaire was designed to get students' and supervisors' responses about supervisors' readiness and students' problem solving skill during the Project-Based Learning implementation in terms to support a proposal framework for polytechnic system.

**Data Analysis**

The present study, a kind of descriptive statistics such as frequency, percentage, mean and standard deviation were used to analyze the variables. The data were analyzed with SPSS version 17 for Windows (Statistics Package for the Statistical Analysis). The questionnaire was consisted of five-point Likert scale. It was designed to measure various dimensions, and the interpretation of mean scores of each variable used in accordance with the range of scales.

## RESULTS

**Extended a new framework for the Project-Based Learning in the Polytechnic system**

To understand the implementation of Project-Based Learning, the evaluation of those was prepared with CIPP model. The Project-Based Learning has been implemented at Polytechnic Malaysia since 2007. However, there was a dubious and problematic of its implementation. Since 2007, several evaluation studies have been conducted to evaluate the effectiveness of Project-Based Learning in the Polytechnic system. The previous findings of the studies show that Project-Based Learning has positive outcomes to the student's achievement. It was found that by using Project-Based Learning, students' performed significantly better.

Yet, the finding data, based on the present research, could be used to suggest a new framework for Project-Based Learning in the polytechnic system in Malaysia. The significant aspect to be included in Project-Based Learning is effective supervising skills. However, from the results, some supervisors have no proficiency skills of Project-Based Learning. The respondents also believed that supervisors with education-based were better than engineering-based supervisors in terms of supervising skills. The second crucial aspect was effective collaboration among the team participants. However, some students stated there was a lack of collaboration among the group members during the project. Therefore, this situation resulted less quality of the project.

Table 1. Supervisor' readiness perceived by students (n = 118) and supervisors (n = 43)

| | Items | Perceived by students | | *Perceived by supervisors* | |
|---|---|---|---|---|---|
| | | *M (ME)* | *Interpretation* | *M (ME)* | *Interpretation* |
| 1. | My supervisor has the appropriate technical knowledge with regard to my project. | 4.07 (.06) | Agree | 4.21 (.09) | Strongly Agree |
| 2. | My supervisor has supervised me effectively. | 4.10 (.08) | Agree | 4.28 (.09) | Strongly Agree |
| 3. | My supervisor and I have determined the objectives to be achieved in the project. | 4.25 (.06) | Strongly Agree | 4.44 (.08) | Strongly Agree |
| | Total (Item L8 to L10) | 4.14 | | 4.31 | |

Table 2. Problem Solving Skills perceived by the students (n = 118) and supervisors (n = 43)

| | Items | Perceived by Students | | Perceived by Supervisors | |
|---|---|---|---|---|---|
| | | *M (ME)* | *Interpretation* | *M (ME)* | *Interpretation* |
| 1. | Through Project-Based Learning, students 'problem solving skills has increased. | 3.75 (.08) | Agree | 3.86 (.11) | Agree |
| 2. | While there are problems during in the project, students discuss with the supervisor. | 4.09 (.06) | Agree | 4.09 (.13) | Agree |
| 3. | Critical and creative thinking are needed to solve the problem. | 4.25 (.05) | Strongly Agree | 4.47 (.09) | Strongly Agree |
| 4. | Project-Based Learning has increased students' ability to work in group in solving the problem. | 3.90 (.09) | Agree | 4.00 (.12) | Agree |
| 5. | Together with the group, I share my idea with the group in the project. | 4.30 (.06) | Strongly Agree | 4.14 (.10) | Agree |
| 6. | With my group, I manage the information that we get during the project | 4.20 (.08) | Agree | 4.16 (.09) | Agree |
| | Total (Items L16 to L21) | 4.08 | | 4.12 | |

The next important issue to be addressed in the Project-Based Learning was effective communication between the students and the supervisors. From the data, some supervisors convinced that students' communication between the students and their supervisors was important skill in the Project-Based Learning. The fourth aspect to be included was creative thinking. Project-Based Learning purposes to improve students' higher-order thinking skills in solving the problems. Nevertheless, some supervisors believed that their students were less creative in resulting the idea for their project. Finally, the last important aspect was problem solving skill. Furthermore, Project-Based Learning emphasizes on the students' problem solving skills by involving the real world problem. From the result data, some students were overly rely on their supervisors to solve the problems in the project. At least, a new framework for the Project-Based Learning could be constructed with those five domains.

## DISCUSSION

Based on the empirical data which derived from the present study, a new framework for Project-Based Learning is suggested for the polytechnics system. The study concluded that there were eight critical elements that significance Project-Based Learning in the polytechnic. The five elements are (1) knowledge about Project-Based Learning, (2) supervision, (3) collaboration, (4) communication, and (5) creativity, that been performed at Table 3. The first element is the enhancement of the students' and supervisors' knowledge of Project-Based Learning. The project coordinator should embrace briefing sessions with students and supervisors to expose them to theory and practice of Project-Based Learning. Next, the improvement of the supervisors' supervising skills is absolutely important. It is significant for the institution to train its lecturers to develop both the technical skills and supervising skills.

Effective teamwork among the group fellows is the next vital part to be advanced. Working in intact group is critical to sustain students-centered learning. Derived from the findings, collaboration plays key role in carrying out the project. The fourth element is communication skills of the students and their supervisors. Puny communication expertise were found to be detrimental to the project. During the project, some students had problem to communicate with their supervisors. The final element is the students' creativity. The students are expected to have critical thoughtful and creativity in the project. This can be revealed in their final products. The supervisors complained that their learners' projects were not innovative.

Critical Elements of the Project-Based Learning

a. Project-Based Learning knowledge
    1. Providing early exposure about Project-Based Learning
    2. Introducing the function of e-SOLMS
b. Supervision
    1. Developing supervisors' supervising skills
    2. Improving the supervisors' communication skills and changing students' negative attitudes
c. Collaboration
    1. Developing students' collaboration / teamwork skills
    2. Developing interpersonal skills for students and supervisors
d. Communication
    1. Enhancing students' and supervisors communication skills
e. Creativity
    1. Nurturing students' creativity since the first semester
    2. Conducting brain storming activities regularly

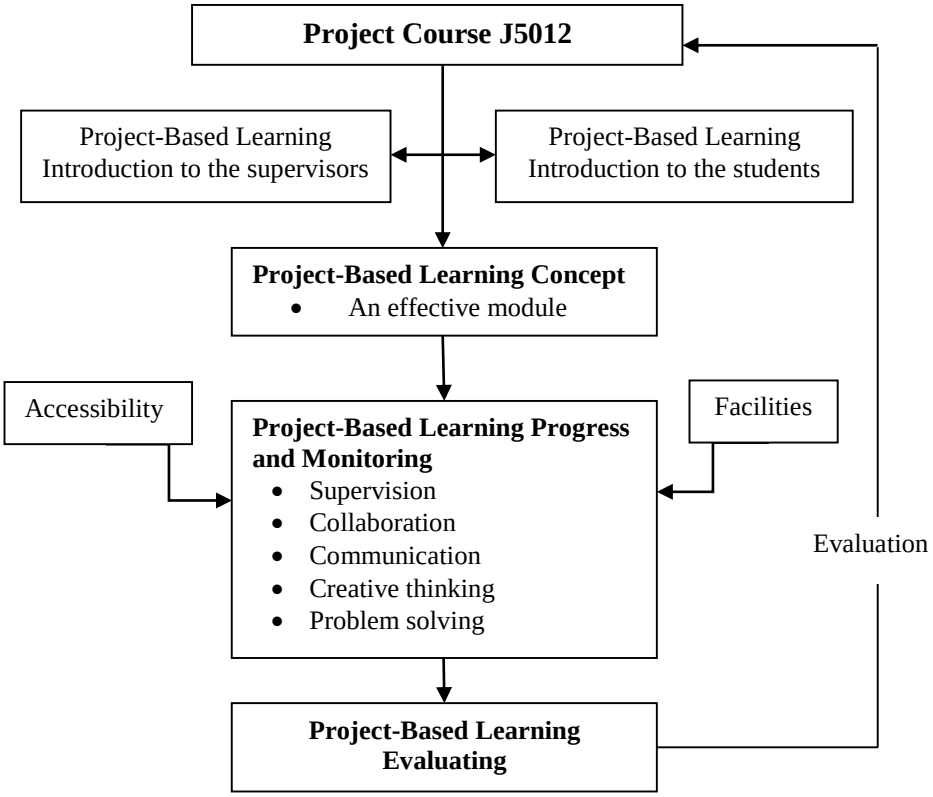
Based on the findings of the study, a new framework is proposed. Project-Based Learning was perceived as appropriate approach for the final project course in the polytechnic. Therefore, the project coordinator should hold a briefing class for introducing the Project-Based Learning's concept to the students and supervisors. With respect to the project module, some students performed a problem to understand the module. Thus, it is suggested that the Project Module be reviewed by experts (including industrial experts) to improve and develop the module' contents.

According to its concepts, Project-Based Learning was kind of constructivism approach that engages students in real-world project by involving the students to develop and apply their skills and knowledge. However, from the findings, some students had difficulty in solving the problem due to lacking of technical knowledge. They should refer to the experts in industry of manufacturer. Therefore, in project implementation, the supervisors should reinforce their supervising skills, enhance their collaboration and communication skills and nurture students' creativity and problem solving skills. In the final stage, the product evaluation is required to assess the quality of the Project-Based Learning implementation.

Figure 1 illustrates the new framework for the Project-Based Learning based on the empirical data of the study. There are five new elements which emerged from the present study. The new elements are basic knowledge, supervision, collaboration, communication, and creative thinking and accessbility Thus, a new framework for Project-Based Learning is deemed necessary to incorporate the new elements. As a main contribution of this study, the new framework is a new addition to the knowledge corpus of Problem-Based Learning for the polytechnic system in Malaysia

Commonly, the students and supervisors perceived that Project-Based Learning approach was appropriate for the Project Course J5012. This implies that the polytechnic should carry on the implementation of Project-Based Learning. In case of project-Based Learning progress, students and supervisors revealed the main problems in project such as lack of communication with group, inadequate facilities, and inadequate funding. Schneider (2005) emphasized that the students may have difficulty in Project Based Learning, for example, difficulty to find a project idea, to manage time, to collaborate with peers, and to produce quality product. The strategic finding from the present study is that most of the students perceived that Project-Based Learning has upgraded their experience and improved their knowledge. It implies that Project-Based Learning was appropriate for

project course J5012. Further, an essential characteristic of Project-Based Learning is that it focuses on doing something that enhance one's hands-on experience (Moursund, 2002).

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# STUDENTS' UNDERSTANDING THROUGH THE USE OF ICT-BASED ACCOUNTING MULTIMEDIA (MAKSI) IN VOCATIONAL HIGH SCHOOLS

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Abstract

*This study aims to describe the use of MAKSI: Information and Communication Technology (ICT) based accounting multimedia in improving students' understanding on bank reconciliation material in Vocational High Schools (SMK). This research is a quantitative-descriptive research with case study method involving 40 students. Data collection techniques used are tests using essay tests, observations and interviews. The result showed that the average understanding before using MAKSI is 52.18 with the less category, while after using MAKSI the average increases to 76.23 with good category. Before using MAKSI, 65% of students have less understanding, 27.5% have sufficient understanding, while 10% have good understanding. After using MAKSI, the percentage of the the students who have good understanding increases to 40%. In addition, there are 40% of students who have very good understanding. Those who have less understanding are only 7.5% while 12.5% of them have sufficient understanding. Thus, the use of MAKSI in learning in SMK can improve students' understanding.*

***Keywords:*** *learning media, ICT, multimedia, understanding, accounting, SMK.*

## INTRODUCTION

Learning is the most important activity in the process of developing student potential and character. It is an activity to explore knowledge, as part of the initial development of knowledge literacy and is perfected through practice in the field (Cajkler & Wood, 2016, p. 98). In order for learning activities to run according to purpose, then learning activity should be designed as attractively as possible. Interesting learning activities can be done by giving students real-life illustrations, showing empathy to their difficulties, being enthusiastic in teaching, explaining interestingly, and establishing continuous knowledge concepts between curriculum, teachers, and students (Butler & Reddy, 2010, p. 776). This can be done by providing the relevant tasks with the ability, skills, and abilities of students can apply it daily.

Teachers should be able to adjust the learning conditions that students can use thoroughly because students have different learning behaviors. The adjust of conditions in question is the application of strategies, models, or learning methods that will be done in the learning process. Lesson planning also needs to be done for effective learning so as to encourage students to reflect on knowledge, skills, and attitudes to new problems encountered (Scott & Cong, 2010, p. 283). Learning needs to be conditioned in such a way as to actual conditions so that students get a concrete, meaningful, and memorable experience (Sanjaya, 2013, p. 35). Someone is said to learn if there is a change of behavior either cognitive, affective, or psychomotor changes thoroughly (Dimyati & Mudjiono, 2010, p. 10). Changes in student behavior that is the process of learning is visible through the behavior of students learning the material. Learning behavior is a student response to the action of learning from the teacher. Thus, the design of appropriate learning in accordance with the conditions and learning needs of students will facilitate the achievement of learning objectives. Students will also more easily understand the material so that student learning outcomes will increase.

Along with the development of the era, the success of learning depends on the accuracy of teachers in using technology to fit the learning objectives and specifically create meaningful learning for students (Wankel & Blessinger, 2015, p. 5). Through these advancements teachers can use various media in accordance with the needs and objectives of learning. By using technology-based learning media not only can simplify and streamline the learning process, but also can create an interesting learning process, fun, memorable and provide a direct learning experience for students. Therefore, it is necessary to design a learning by using technology or Information, and Communication Technology (ICT) in order to maximize student learning activities. The use of ICT in learning is already a demand that must be met in the current era of learning because ICT is also proven to optimize student learning outcomes.

In general, ICT in education is considered a challenge and opportunity (Lindberg, Olofsson, & Fransson, 2017, p. 129; Shittu & Shittu, 2015, p. 180). ICT is perceived as a challenge due to the time constraints of learning and the lack of expertise in the use of ICT. On the other hand, ICT is considered an opportunity because of the strong expectations of teachers and students about the development of ICT utilization in education to facilitate ease of learning. Teachers as educators will always be required to be creative and innovative in seeking learning breakthrough in order to achieve learning objectives and be able to generate students' happiness during the learning process (Saputra & Purnama, 2012, p. 61). This is because teachers play an important role in the development of attitudes, knowledge, and skills of students. Therefore, teachers should also always develop in accordance with the development of era to fulfill the needs of students.

ICT has brought many benefits to education, affecting many countries to implement ICT in learning (Andoh, 2015, p. 1), including learning in Vocational High Schools (SMK) in Indonesia. SMK is one of the secondary education level that specifically prepares its graduates to ready to work according to their area of expertise (Yogiyatno & Sofyan, 2013, p. 392). There are various areas of vocational expertise in Indonesia, one of which is the area of business and management expertise. The area of business and management expertise is an area of expertise that develops professions of business and management professions including accounting skills programs.

Accounting learning in SMK covers not only theory but also requires skill, practice, and real practice. The demand is in accordance with the objectives of the SMK is to produce graduates who are ready to work in accordance with the field of expertise. Therefore, in order to achieve these objectives, it is necessary that learning can provide students with a learning experience that is close to the actual field conditions.

The use of ICT in education is able to change the old paradigm of learning by displaying technology as a teaching tool to supporting the learning process (Admadja & Marpanaji, 2016, p. 174). ICT makes it easier for students to search for information needed in learning (Menkhoff, Yian, Wah, & Kee, 2011, p. 147). The use of ICT in learning, such as computer applications, enables an effective and efficient learning process in terms of time and material achievement (Himmah & Triyono, 2014, p. 234). ICT can also be used to help improve the quality of learning and student learning outcomes. However, in fact the utilization of ICT in SMK has not been optimal (Pratiwi, Siswandari, & Santosa, 2017, p. 77). This is because in the learning in SMK is still dominated by the use of textbooks. Teachers also still use lecture methods so that learning depends on the teacher's explanation. The facilities and infrastructure provided by the school are also quite adequate. Meanwhile, the curriculum requires independent and student-centred learning with the assistance of technology. It makes students feel saturated and passive during the learning so that they have difficulties understanding the material being taught.

Understanding is the ability of a person to understand something after it is known and remembered (Sudijono, 2006, p. 50). For optimal understanding, it is necessary to make conditions that support in learning. Student understanding can be imrpoved using innovative ICT-assisted learning (Butler & Reddy, 2010, p. 772). The use of ICT in learning can be utilized as learning media. The use of ICT as learning media can be in the form of Point Point slide file, pictures, animation, video, audio, simulation program, and others (Tellez, 2008, pp. 192-193). ICT-based learning media have proven to have potential and pedagogic value to improve the quality of learning (Marquez, Machuca, & Lopez, 2010, p. 1396). According to Zweekhorst & Maas (2014, p. 16) ICT-based learning media can facilitate and improve the level of communication and interaction between students and between students and teachers. Students feel more involved in learning so that students also feel the understanding of the material increases so that the learning outcomes also increase.

The development of ICT in the world of education has also changed the students' attitudes in learning including in accounting learning in SMK. Multimedia is one of the varieties of ICT-based learning media. The multimedia used to facilitate learning can be defined as an integral combination of text, graphics, sound, animation, and video elements that are digitally processed through computers to deliver learning materials from learning resources to learners in which learners are able to actively control which elements appear and when the appearance of these elements (Yogiyanto & Sofyan, 2013, p. 394). Multimedia is an appropriate tool and allows students to actively engage in learning and facilitate learning, and enable students to make decisions or take active action involving them in the learning process (Marquez, et al., 2012, p. 1402).

Multimedia has great potential as an effective learning medium used in areas of study that are difficult to visualize (Kulasekara, Jayatilleke, & Coomaraswamy, 2008, p. 83). ICT-based learning by utilizing multimedia can be used as an easy-to-understand learning media alternative for students so as to improve students' mindset thoroughly, sustainably and provide deep understanding as it bridges the gap between theory and practice. Multimedia can also improve student learning outcomes and improve interaction between students and teachers so that students will be more active and communicative during the learning process. Therefore, multimedia is expected to strengthen the strategy in accounting learning in SMK (Pratiwi, et al., 2017, p. 77). This is supported by the opinion of Sithole (2017, p. 1) stating that students' understanding in accounting subject can be improved by integrating texts and diagrams (multimedia).

Based on these conditions, students need learning that combines direct vis-a-vis learning and ICT-assisted learning (Weil & Silva, 2014, p. 224). The utilization of ICT-

based accounting multimedia (MAKSI) is expected to be an alternative medium of accounting learning to improve students' understanding. MAKSI is a combination of various learning media assisted by technology, information, and communication which together display information to convey accounting learning materials to students. The accounting learning material available on the MAKSI is a bank reconciliation. MAKSI is designed with an attractive look and includes material, simulated material work, and student learning evaluations packaged in animated video and games. Interesting media concepts, fun, and can provide a direct learning experience for students in accordance with the conditions of students and kebutuhsn learning media that students need.

Accounting material used in this research is bank reconciliation material taught to the eleventh-grade students of accounting department. Bank reconciliation is an analysis of the information and the amount that causes the cash balance reported in the current account to be different from the cash balance in the ledger, and aims to generate adjusted cash balances (Reeve, Warren, & Dunchac (2009, p. 407). Students are required to understand the definition of bank reconciliation and the causes of bank reconciliation to recording and reporting procedures of bank reconciliation By studying this material is expected to be a provision for students in facing the world of work in the field of accounting and financial institutions. This material was chosen because based on the results of initial interviews with 60 elelventh-grade students of accounting department in SMK Negeri 1 Surabaya, 65% of them stated bank reconciliation material was a difficult material to understand. Therefore, this study aims to describe the utilization of ICT-based accounting multimedia (MAKSI) to impove students' understanding on bank reconciliation material in SMK.

## RESEARCH METHOD

The type of this research is quantitative descriptive research with case study method. The research was conducted at SMK Negeri 1 Surabaya. SMK Negeri 1 Surabaya is one of the vocational school that has the competency of Accredited Accounting A and has a quality management system standardized ISO 9001: 2000. In addition, the curriculum used is the Kurikulum 2013 and the availability of facilities and infrastructure in SMK Negeri 1 Surabaya also support for the implementation ICT-based learning. The Kurikulum 2013 is designed to create student-centered learning that not only prioritizes knowledge development, but also student attitudes and skills. The Kurikulum 2013 also requires the use of ICT in the learning process to support student-oriented learning. In the Kurikulum 2013, financial accounting subjects are productive subjects taught during the six hours of lessons during the week that are held by eleventh-grade students and twelfth-grade students. One of the materials in it is a bank reconciliation material taught to students of eleventh-grade students of Accounting.

The subjects of this research were eleventh-grade students of accounting department who had learnt bank reconciliation material. The sample used was 40 students selected using simple random sampling technique because all students who were made into the population learnt the same material, the methods, learning media, and curriculum so that the population is considered homogeneous. The selected students were given preliminary tests before using MAKSI, then were given lessons by using MAKSI, and were given final tests to determine the increase in their understanding. The data were collected using the test technique so that quantitative data was obtained. In addition, observations and interviews were conducted to find out the students' opinions about the benefits of using MAKSI in learning.

The instrument used in this research was an essay test analysed quantitatively, and the observation sheet and interview sheet were analysed descriptively. The essay test is a test in the form of a written question whose answer is essay or long sentence (Purwanto, 2010, p. 35). Essay tests are chosen because these form tests are suitable for comprehensive knowledge, application and analysis so as to fit the characteristics of the bank's reconciliation materials. For the test scoring using the point method because the essay test used is an essay test with limited answers. An essay test with limited answers is an essay test that answers can be formulated specific answers guidelines (limited) so that it can be determined the score of each question

(weighting). The use of essay tests in this study aims to reveal the students' understanding of the bank's reconciliation material.

The results obtained from the test were analysed by scoring on each indicator of the problem in accordance with the scoring guidelines that have been made. The score was then calculated using the percentages correction formula (Purwanto, 2010, p. 102). the score was then interpreted based on the interpretation criteria of student understanding in Table 1.

Table 1. The Interpretation Criteria of the Students' Understanding

| Assessment | Predicates | Critical Interpretation |
|---|---|---|
| 0-30 | E | Very Less Understanding |
| 31-55 | D | Less Understanding |
| 56-65 | C | Sufficient Understanding |
| 66-79 | B | Good Understanding |
| 80-100 | A | Very Good Understanding |

## RESULTS AND DISCUSSIONS

Efforts to improve students' understanding through the utilization of ICT-based accounting multimedia (MAKSI) showed satisfactory results. As many as 65% of the 40 students tested were able to exceed the minimum score (KKM) of accounting subjects by 75 after using MAKSI. Yet, before using MAKSI, all students had not been able to reach it. The essay test used as a test instrument consists of 4 questions concerning bank reconciliation material. The items were made based on the indicators of learning objectives to be achieved; they are: the definition and scope of bank reconciliation, the causes of bank reconciliation, the reasons for bank reconciliation, and the practice of bank reconciliation procedure implementation.

The results of the essay test score analysis showed the average understanding of students before using MAKSI is 52.18 with less category, while that after using MAKSI increases to 76.23 with good category. This shows that in general the use of MAKSI can improve students' understanding on bank reconciliation material. A more detailed explanation of the students' understanding of essay work on bank reconciliation materials for each item is as follows:

### The Definition and Scope of Bank Reconciliation

The first item on the essay test given to the students relates to the understanding and scope of bank reconciliation. Students are asked to explain the meaning of bank reconciliation and the meaning of the bank statement. The maximum score that students get if they are able to answer the first question correctly is 10. The students' understanding in answering this question indicator can be illustrated in Figure 1.

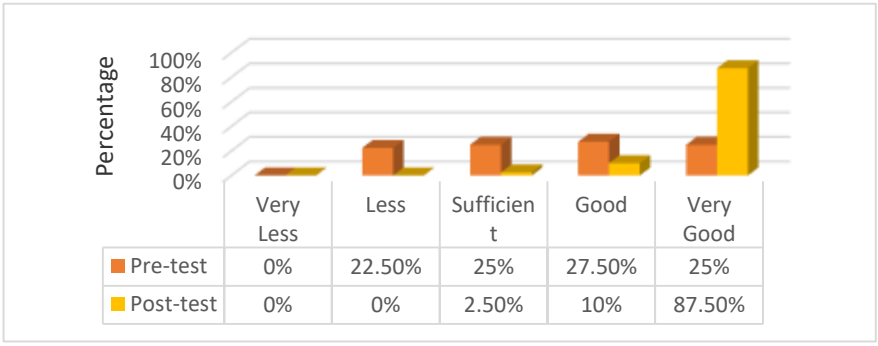



Figure 1. Student's Understanding on the First Question Indicator

Based on the Figure 1, it appears that there is an increase in students' understanding of the indicator of definition and scope of bank reconciliation before and after using MAKSI. Before using MAKSI, the students have a very good understanding by only 25%, good understanding category by 27.5%, sufficient category by 25%, and less category by 22.5%. The results showed that some students did not yet have a good understanding of the definition and scope of bank reconciliation. This happened because they felt that the bank reconciliation material was unattractive so it was easily forgotten. Moreover, the media used were only in the form of textbooks so that they got bored and less understanding of this first indicator. However, some other students already had good understanding so as to describe the understanding and scope of bank reconciliation completely.

After using MAKSI, the percentage of the students' understanding increases to 87.5% in the category of very good understanding, 10% in good category, and 2.5% in sufficient category. The results show that after using MAKSI, the students' understanding about the definition and scope of bank reconciliation increases, even most of the students have a very good understanding. They felt that MAKSI is an interesting medium and helps them more easily memorize and understand the definition and scope of bank reconciliation. Therefore, after using ICT-based accounting multimedia, they a complete understanding of the definition and scope of bank reconciliation.

**The Causes of Bank Reconciliation**

The second item on the essay test given to the student is related to the cause of the bank reconciliation. Students are asked to explain what factors are causing differences in cash balances between the company and the bank along with the sample of the transactions. The maximum score that students get if they are able to answer the second question correctly is 15. The students' understanding in answering this question indicator can be illustrated in Figure 2.

Based on figure 2, it appears that before using MAKSI, the students had a poor understanding in answering questions related to the indicator of the causes of bank reconciliation. This is evident from the percentage of the students who have less understanding by 75% and the remaining 25% have very less understanding. This condition indicates that the student has not mastered what causes the happening of bank reconciliation so that less can describe the causes completely. They felt that the terms used in textbooks are difficult to understand so they were less able to interpret the terms.

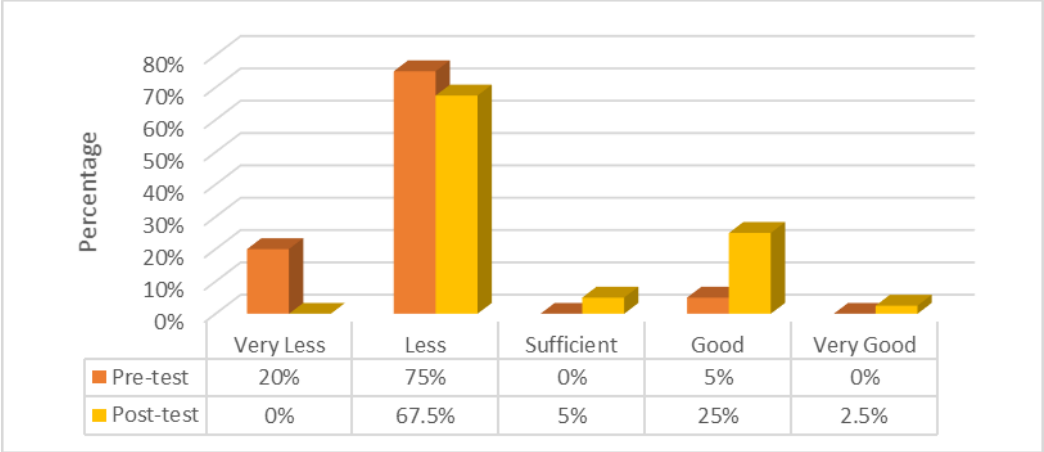



Figure 2. Student's Understanding on the Second Question Indicator

After using MAKSI, the percentage of the students' understanding increases to 2.5% with very good understanding category, 25% with good understanding category, 5% with sufficient understanding category, and 67.5% with less understanding category. These results indicate an increase in students' understanding of the underlying causes of bank reconciliation after using ICT-based accounting multimedia although some students still have less understanding. Students have been able to describe the causes of bank reconciliation even though it is still simple so they can not get maximum score on this second question. Students felt that by using MAKSI, they can understand the causes of banl reconciliation more easily than by using textbooks.

**The Reasons for Bank Reconciliation**

The third item on the essay test given to the student is related to the reason for bank reconciliation. Students are asked to explain why the company is reconciling the bank to determine the amount of the company's cash balance. The maximum score that students get if they are able to answer the third question correctly is 10. The students' understanding in answering this question indicator can be illustrated in Figure 3.

Based on Figure 3, it appears that there is an increase in the indicator of the reason for bank reconciliation. It can be seen from the percentage of the students' understanding before MAKSI by 5% with very less understanding category, 60% with less understanding category, 10% with sufficient understanding category, 10% with good understanding category, and 15% with very good understanding category. This is because the students felt that they have not been able to find the reasons why bank reconciliation is required because they are implied in the textbook. The students tend to memorize this material so that they have not been able to deduce and find the common thread on the material learned.

After using MAKSI, the percentage of the students' understanding increases to 15% with less understanding category, 15% with sufficient understanding category, 25% with good understanding category, and 45% with very good understanding category. These results show that after using ICT-based accounting multimedia, the students were able to answer the question completely because they have good understanding when compared to their understanding before using ICT-based accounting multimedia.

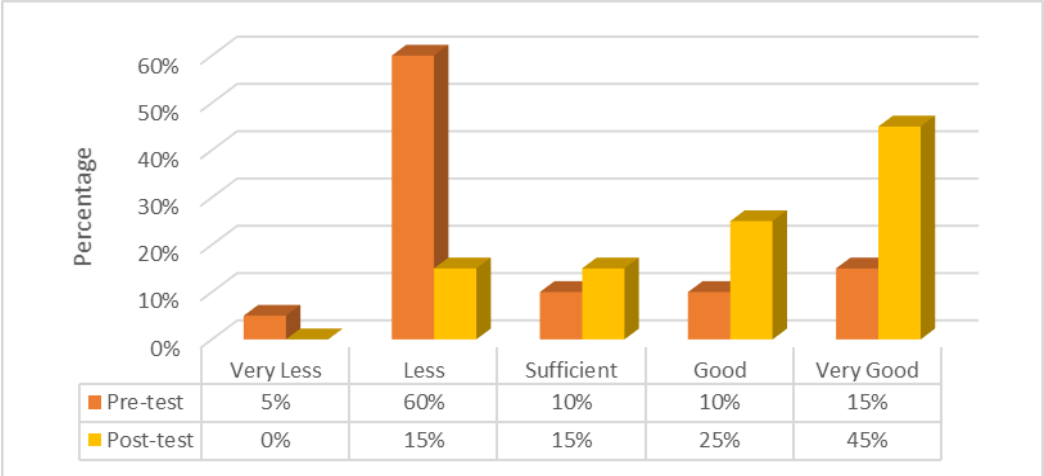



Figure 3. Student's Understanding on the Third Question Indicator

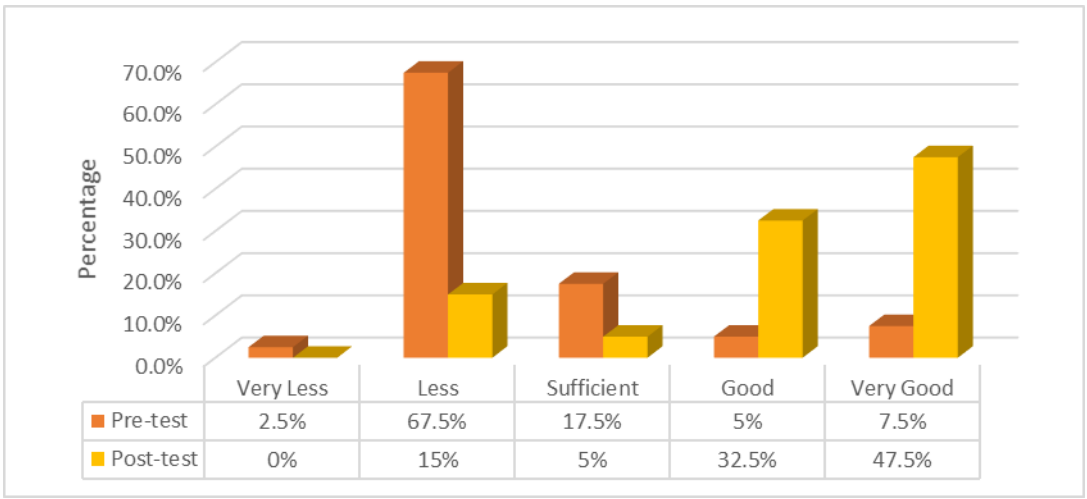
This increase in understanding is because they have a clearer picture of bank reconciliation material, so they can find the bank reconciliation reasons for the company. The picture was obtained by the students from the illustration presented in the form of a learning video on one of the menus available on MAKSI.

**The Practice of Bank Reconciliation Procedure Implementation**

The fourth item on the essay test given to the students relates to the practice of bank reconciliation work. This last question consists of two instructions of practice on the case of transactions related to bank reconciliation. At the first instruction, the student is required to create a bank reconciliation report in the form of a reconciliation of the balance by the bank and the balance according to the company leads to the correct balance, as well as the form of balance reconciliation by bank leading to the balance of the company. The maximum score a student receives if able to answer this first instruction correctly is 50. Then in the second instruction, the student is required to create a journal to be made by the company to adjust the cash balance based on the bank reconciliation report that has been made. The maximum score that students get if able to answer the second instruction correctly is 15. Thus the total score of the four items of the essay test used is 100. The students' understanding in answering this question indicator can be illustrated in Figure 4.

Based on Figure 4, the students' understanding on the indicator of the practice of bank reconciliation procedure implementation increases. Before using MAKSI the percentage of students include in the category of very less understanding is 2.5%; the category of less understanding is 67.5%; the category of sufficient understanding is 17.5%; the good understanding category is 5%; and the very good category is 7, 5%. This is because they did not understand the reasons why the bank reconciliation is required well so that they have difficulty in doing the practice of bank reconciliation.

After using MAKSI, their understanding increases to 15% with less understanding category, 5% with sufficient understanding category, 32.5% with good understanding category, and 47.5% with very good understanding category. These results indicate that after using ICT-based accounting multimedia, students' understanding of bank reconciliation procedure implementation increases so as to fully implement the practice of bank reconciliation. They were able to work on issues related to bank reconciliation arrangements in the form of bank reconciliation leading to the correct balance, and bank reconsideration leads to the balance of the company to arrange the journal needed to correct errors from the bank reconciliation. This is because students can work on a simulation of reconciliation in a more interesting way in the MAKSI application. Students felt that the learning was more fun so it was easier to understand the material.




| | Very Less | Less | Sufficient | Good | Very Good |
|---|---|---|---|---|---|
| Pre-test | 2.5% | 67.5% | 17.5% | 5% | 7.5% |
| Post-test | 0% | 15% | 5% | 32.5% | 47.5% |

Figure 4. Student's Understanding on the Fourth Question Indicator

From the overall results, it can be concluded that before using MAKSI, 62.5% of 40 students included in the category of having less understanding. Only 10% of students include in the category of good understanding, while the remaining 27.5% include in the category of sufficient understanding. After learning using MAKSI, the category of the students who have good understanding increases to 40%. Moreover, 40% of students include in the category of very good understanding. Those in the category of less understanding are only 7.5% of 40 students and the remaining 12.5% is in the category have sufficient understanding.

Students 'success in understanding a concept can be seen from the students' ability to name the examples of a concept, to name the characteristics of a concept, to choose and to distinguish between an example from and not from a concept, and to solve a problem related to the concept learned (Hamalik, 2003, p. 166). If the learning materials delivered by the teacher can be understood by the students, then the students can master each competence well so that the mastery of student competence can increase (Mariyati, 2012, p. 129). Increased mastery of student competence is a manifestation of the results of teaching activities conducted by teachers have been running well.

The use of MAKSI on bank reconciliation material can provide variations in accounting learning and make it easier for students to understand the material by providing a hands-on learning experience to make the students interested, active, and interactive so that their level of understanding increases. The increased understanding of the students is expected to facilitate teachers and students in achieving learning objectives. The benefits of using MAKSI as an ICT-based learning media in SMK on accounting skills program are also expected to familiarize teachers in the use of ICT in learning. Attempts to increase teachers' ability to learn and use ICT-based tools are needed because if teachers have mastered the use of ICT then teachers will feel comfortable to integrate ICT in the learning process (Destiana & Soenarto, 2014, p. 296).

Thus, the effective use of MAKSI tested is used in accounting learning because it can improve students' understanding. This is because the use of MAKSI can create a fun learning and raises students' curiosity so that students are motivated to be active and learn independently in the classroom (Nickchen & Mertsching, 2016, p. 482; Trieb, 2016, p. 310; Shittu & Shittu, 2015, p. 191). Thus, the teacher can act as a facilitator in the learning task of assisting and directing students if having difficulty in learning the material. That learning conditions are in line with the demands of the Kurikulum 2013, which is student centered learning. In addition, MAKSI is also easy to use by students. Exciting displays like games and ease of media operation accessible on laptops/computers and smartphones through free downloading on Play Store make this media flexible to use. The MAKSI interface used in this study is presented in Figure 5.


Figure 5. The Interface of MAKSI

## CONCLUSIONS

Based on the discussion, it can be concluded that the use of ICT-based accounting multimedia is proven to increase students' understanding. This is evidenced by the improvement of the students' ability to answer the questions and to solve the case of bank reconciliation practices. ICT-based accounting multimedia (MAKSI) on bank reconciliation materials can be complementary, alternative, and varied instructional media that can be used in Vocational High School (SMK) learning in Accounting skills programs. The utilization of MAKSI can create a fun learning and raise students' curiosity so that they are motivated to be active and learn independently in the classroom. Such learning conditions are in accordance with the demands of the curriculum, namely learning centred on student development (student-centred).

The headmaster as the manager and the person in charge of the implementation of learning in school are expected to maximize the facilities and infrastructure of the schools to support ICT-based learning process. Therefore, headmaster should motivate teachers to be able to develop innovative and creative learning through training and workshops. Then, teachers as the executor of learning activities should start habituating the use of ICT in learning according to the demands of the curriculum starting with the use of ICT-based accounting multimedia (MAKSI) on bank reconciliation material. The steps that teachers need to do in operating ICT-based multimedia accounting (MAKSI) as follows: (a) make sure school facilities and infrastructure support for the use of MAKSI, such as: computers/laptops, LCDs, and projectors for the application of classical learning; (b) make sure most students have an android based smartphone so students can install MAKSI apps to implement self-learning; (c) for the operation on the laptop/computer file application MAKSI must be duplicated (copy) first in the device to be used. MAKSI application file for operation on laptop/computer using *.swf* format so it must be available Adobe Flash application; (d) for smartphone operation download MAKSI in Play Store with keyword: bank reconciliation; (e) install the MAKSI app on your computer/laptop and smartphone to start operating the app; (f) MAKSI is ready for use in accounting learning.

Thus, it is expected that MAKSI can help sustainable accounting learning in Vocational High School (SMK) to increase students' understanding.

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# LEARNING STRATEGIES OF PRODUCTIVE LESSON AT VOCATIONAL HIGH SCHOOL IN SERANG CITY

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Abstract

*The purpose of this research are: (1) to know the design of delivery strategy of learning of productive lesson; (2) to know the implementation of delivery strategy of learning of productive lesson; and (3) to find out the result of applying the delivery strategy of learning of productive lesson. This research uses qualitative phenomenological approach with multi case design. Informants in this study are students, teachers, leaders of Vocational High School in Serang City. Data collection through interviews and observation. Data analysis technique is Miles & Huberman interactive model. The results of this study found that (1) The design of the delivery of learning strategies productive lesson conducted by teachers is to design learning strategies by involving the media and based on the goal; (2) At the time of learning activities of productive lesson take place, the strategy used by teachers is the use of instructional media by demonstrating to students in front of the classroom; and (3) The implementation of learning delivery strategy of productive lesson applied by the teachers from each of the research sites resulted in increased value.*

**Keywords***: learning strategy, productive lesson*

## INTRODUCTION

Education is essentially an attempt to lead children in their physical and spiritual development toward maturity. Education has an important role in determining the development and manifestation of individuals, communities and the development of a nation and state. Progress of a nation has a strong relationship with the quality of education provided to learners and the community through educational institutions and non-educational institutions.

One form of education applied in Indonesia is vocational education. Vocational education is an educational program that prepares people to enter the workforce, both formal and informal. As a work-oriented education, vocational education has its own peculiarities that is the relationship between knowledge, skills or expertise, as well as the attitude that learners need to get into the world of work.

Based on the National Education System Act No. 20 of 2003 (Department of National Education, 2003), vocational education in Indonesia is divided into two levels: vocational education and vocational education. Vocational education is an education conducted in secondary education that aims to prepare learners primarily to work in a particular field. Vocational education is an education that is conducted in higher education which aims to prepare learners to have a job with a particular applied skill maximal equivalent to the undergraduate program.

Learning is basically an effort to direct the students into the learning process so that they can get the learning objectives in accordance with what is expected. learning objectives can be achieved if formulated with the right strategy. Learning strategy is a systematic way of communicating the content of the lesson to the students to achieve certain learning objectives.

In teaching and learning activities for a teacher to perform their duties professionally, requires a solid and complete insight about teaching and learning activities. A teacher must know and have a comprehensive picture of how the learning process takes place, as well as what steps are needed so that the tasks of teacher training can be done well and obtain results in accordance with the expected goals (Mufarokah, 2009, p. 3).

A teacher as a major component in the learning process plays an important role. Teacher's duties include educating, teaching, and training. The teacher is the holder of the trust and responsibility.

The purpose of the strategy is first; so that educators and prospective educators are able to implement and, and address educational and teaching programs and issues; so that educators and prospective educators have an intact, smooth, purposeful, systematic, and effective insight (Ahmadi & Prasetya, 1997, p. 5).

In the learning strategy, there are four elements that need attention. First, define the specifications and qualifications for student behavior and personal changes as to what and how to achieve and be targeted from the learning activities based on community aspirations and views. Second, choose the main learning approach system that is deemed most appropriate in order to achieve the target so that it can be used by teachers in carrying out their learning activities.

Third, selecting and setting procedures, methods, and learning techniques that are considered the most effective and efficient to be used as a handle of teachers in carrying out their duties. Fourth, establish norms and minimum limits of success or criteria and measures of success as teacher guidance in implementing evaluation of learning outcomes which will then serve as feedback for improvements to the overall instructional system (Mansyur, 1991, p. 3).

Selection, and then the determination of learning strategies, should also pay attention to the purpose of learning, because the goal of learning is the target or target to be achieved. Both are a series. Learning objectives have a very important role in designing a subject. In addition, learning objectives may also affect the determination of the learning strategy to be applied. Incorrect strategy determination can be fatal, counterproductive and contrary to what it wants to achieve (Zaini, Munthe, Aryani, Djamaluddin, & Rosyad, 2002, p. 96).

Thus in general the selection of learning strategies occupy a fairly important position in the learning process. The essence of the learning process is to set learning strategies, among which are setting organizing strategies, delivery strategies, and learning management strategies (Degeng, 1990, p. 9).

Lesson in Vocational High School (*Sekolah Menengah Kejuruan*/SMK) can be divided into 3 kinds namely, learning lesson Adaptive, Normative, and Productive. Normative lesson are regularly allocated subject groups that include Religious Education, Citizenship Education, Indonesian Language, Physical Education of Sport and Health, and Cultural Art. Adaptive lesson consist of English, Mathematics, Science, Social Studies, Computer Skills and Information Management, and Entrepreneurship lesson. While the lesson Productive on a number of lesson are grouped in the Basic Competence of Expertise and Competence Expertise. Vocational High School has a specificity. The specificity lies in productive lesson.

The third learning strategy of these lesson is different from each other. SMK as a school that has the main goal is to produce graduates who are ready to work, certainly more dominant productive subjects received by students than on adaptive and normative subjects.Vocational teachers in delivering productive learning materials should be different when teaching adaptive and normative subjects.

In line with Bayu's research results, that learning using a particular approach will affect the active, creative, and productive classroom atmosphere. If it is linked to a scientific approach to learning in the Curriculum of 2013, then scientific learning will be appropriate if the teacher is able to organize to create an active, creative, and productive classroom atmosphere (Setiyadi & Ramdani, 2016).

One of the important dimensions of learning productive lesson is learning strategy. The use of appropriate and optimal learning strategies will encourage initiative and facilitate student learning. Therefore, the study of learning strategies and their implementation is an important requirement to be undertaken. A teacher must have the competence of designing the right learning strategy.

This is in line with the results of Nurtanto's (2016) study that a teacher must have competence in preparing the lesson: (1) reflecting personality values; (2) master the role of teachers and develop skills competence; (3) able to understand and develop learning tools; (4) able to arrange and implement the learning program; (5) able to assess the process and learning outcomes; (6) arrange administration; (7) using various methods according to the characteristics of learners; (8) linking learning to society, industry, and college and adaptation to technological developments; (9) conducting classroom action research; and (10) publish the results of the study.

Based on the problems that occur in the process of learning productive lesson in vocational school, the researchers intend to examine the "Learning Early Productive Strategies In Electricity Engineering Expertise Program in Vocational School Serang City".

Strategy can be interpreted as an outline of the bow to act in an effort to achieve a predetermined goal. Strategy is a way or a method, whereas in general the strategy has the meaning of a outline of the bow to act in an effort to achieve a predetermined goal (Djamaroh, 2002).

Learning is an activity undertaken by the teacher in such a way, so that student behavior changes to the better. Learning can be interpreted as a process or way that is done so that a person can do learning activities, while learning is a change in one's behavior due to interaction with the environment and experience (Arifin, 2012).

The article entitled "Student learning strategies on industrial work practices in obtaining competence" shows that the strategies used by students in obtaining competence in industrial work practices are (1) learning to use the five senses; (2) learning to solve problems; (3) self-learning; (4) learning through work environment; and (5) continuous and repeated learning (Fatkhurrokhman, 2016).

## RESEARCH METHODOLOGY

Research on learning strategy of productive lesson in electric power engineering program of Serang City (multi case study in SMK Kota Serang) uses qualitative naturalistic research.

This research was conducted in Serang City Vocational School, SMK N 2 Serang City, SMK PGRI 1 Serang City, SMK PGRI 2 Serang City, SMK Pasundan, SMK Prisma, and SMK N 4 Serang City. This research was conducted for 7 months from April to October 2017. In this case, the units of analysis are

students, productive subject teachers, principals, and vice principals.

Techniques and instruments of data collection include participant observation data, in-depth interviews, and completed with documentation. Data analysis techniques used are interactive models Miles, Huberman, & Saldana (2014). This technique consists of 4 stages of data collection, data condensation, data display, and drawing and verifying conclusions.

## RESULT AND ANALYSIS

In this chapter is presented the description of the discussion in accordance with the results of research, so that in this discussion researchers will integrate the results of research with theories that have been described previously. As stated in the descriptive qualitative data analysis technique (exposure) of the data obtained through documentation, observation, and interviews are identified to fit the intended objectives, the results of the research are linked to existing theories and discussed as follows: (a) design the strategy of delivering the learning of productive subjects in improving students 'learning achievement (b) applying the delivery strategy of learning productive subjects in improving students' learning achievement and c) the result of the implementation of learning strategy of productive subjects in improving student achievement.

### The Design of Delivery Strategy of Learning Productive Lesson

In research, the researcher reveal the design of delivery strategy of learning productive lesson in improving student learning. From the research results can be seen that. First, the design of the delivery strategy of learning productive lesson by teachers is by designing the learning strategy by involving the media. Second, in designing the delivery strategy of learning productive lesson is the selection of learning forms tailored to the conditions, characteristics and abilities of students.

Based on the observation of the researcher, the design of the delivery strategy of productive lesson made by the teacher is the preparation of planning the use of learning media and the learning form based on the purpose. Planning the use of learning media is poured in a Learning Implementation Plan (*Rencana Pelaksanaan Pembelajaran*/RPP). In making the RPP must be made with a detailed design so that the learning objectives can be achieved. This is in line with the research (Abizar, 2016) that in making the RPP device needs which needs a detailed design so that it can produce RPP that is suitable to be used as a reference for learning. The same thing is also conveyed by Hariyanto (2012) that in the Development of Implementation Plan of Learning in the field of productive construction of stone and concrete that has been integrated entrepreneurship by incorporating the method of learning is able to make students active in learning activities so as to form the soul of students to entrepreneurship.

In choosing learning media, basically the principle used by the teacher is its effectiveness in achieving the learning objectives other than that the principle that is in use is the interactivity and flexibility. This means that the direction of all the formulation of a strategy is the achievement of goals. Thus the learning steps, the utilization of various facilities and learning resources directed in efforts to achieve learning objectives (Sanjaya, 2008).

Therefore, before determining a strategy, it is necessary to formulate a strategy that can be measured its success, because the goal is the core of the implementation of learning strategy. In designing learning, teachers need to create conditions so that students can learn energetically and motivated. All of that can be designed through the approach of classical learning form in large groups, small class groups and even learn independently. But while teachers use different forms of learning, ultimately the ultimate goal is how each individual learns.

The results showed that the design of classroom learning was designed to create conditions so that students could learn effectively energetically so as to achieve the goal. Conditions can be defined various learning experiences designed so that students achieve goals. Similarly, in making the design of learning in the classroom, the characteristics of students' abilities are also a concern of teachers in setting learning groups. Understanding students' abilities needs to be understood to determine from which the design of learning strategies should begin.

Referring to the opinion of Dick and Carrey as quoted by Sanjaya (2008) "Learning strategy is a set of materials and learning procedures that are used together to cause learning outcomes in students". So teachers should not only do or make the design of learning delivery strategy only at the stage of the activity or procedure, but the teacher must also design and mangatur material or package program that will be delivered to students.

**Implementation of Learning Delivery Strategy Productive lesson**

In research, the researcher revealed the implementation of delivery strategy of learning productive lesson. From the research results can be seen that. First, the implementation of learning productive lesson conducted has been referring to the rules and rules that have been planned and defined in every activity or learning process in an educational institution. Just as any good learning activity requires clear decision actions from the teacher during the planning, during the learning process, and the time to assess the outcome.

Second, the learning of productive lesson class begins with preliminary activities beginning with prayer and apperception, followed by the core activity of the teacher conveying the purpose of explaining the material to the students and ending with the closing activities of the teacher together with the students concluded the material being studied. The position of the strategy in learning is the plan, the rules, the steps and the means by which practice will be played and will be passed from opening to closing in the process of learning in the classroom in order to realize the goal.

Third, when the learning activities of productive lesson take place, the strategy used by the teacher is the use of learning media by demoting to the students in front of the class. The learning process aims to facilitate students in understanding abstract productive subject mathematics material. This is in accordance with the opinion of Hengki Irawan that the value of learning outcomes is better because in learning using props so that learners are more active in following the learning (Irawan, 2016).

Media is anything that can be used to channel the message from the sender to the recipient so that it can stimulate the thoughts, feelings, attention, and interests of students that lead to the learning process. Given the learning media is important in this strategy, teachers use learning media and provide flexibility of students to express themselves. That is why this component is more concerned about the study of what learning activities are done by students and how the role of media that stimulates learning activities.

The media used in various productive lesson, such as Job Sheet, Work Sheet, Module, and Lab Sheet. The media is very helpful for a teacher in the process of learning productive lesson. This is in line with the results of the study Armansyah, Saputro, & Rohman (2017) that the implementation of learning using Work Preparation Sheet can improve the results of students' machining practices.

According to the researcher, when using teacher learning media should pay attention to the principle of media usage is the availability of time to use it. So the media is really useful for students at the time of learning productive lesson took place in the classroom. Fourth, the form of learning by varied teachers tailored to the material, conditions and characteristics of students. At the time of learning productive lesson take place in the classroom, the learning model used classical and group. This is because the arrangement, arrangement, and style of teaching is very dependent on the teacher and his skills in managing the form of learning in the classroom, and is strongly influenced by differences in situation, condition and characteristics of students.

This is in accordance with Sanjaya's opinion. "In classroom learning the teacher needs to create conditions so that students can learn with full motivation. It can be done with a classical or group learning approach". Presentation of the material on the process of classical learning more emphasis to explain something material that is not known or understood students. Group learning is carried out in a group process. The group members are interconnected and participate, contributing to achieve common goals. However, the application of classical learning strategies and group strategies used in productive learning activities in the target class is ultimately how each individual can learn. therefore, it can not

be said that all particular strategies are best and most suitable for all learning situations and conditions.

Based on the observation of the researcher, when the learning took place the teacher used the variation of methods in the learning activities. The teacher uses a variety of methods so that students do not feel bored and cultivate learning motivation. Variations are the skills of teachers in using the ability to realize the goals of student learning and effective learning activities. The purpose of the use of variations such as increasing the motivation and attention of students, facilitate the achievement of learning objectives.

The use of variations include the use of lecture, demonstration and discussion methods in the learning activities of productive lesson in class. According to the researcher, as a characteristic learning subject has an abstract object of study, the presentation of the lesson of productive lesson should not begin with theorem or definition, but must be adjusted to the level of the students' thinking development. The learning process does not need to use many methods of lecturing, the most important is to demonstrate in front of the classroom by using instructional media. Using concrete objects is an appropriate means to teach productive lesson.

Based on observations of researchers at the time of learning took place, teachers also provide motivation to learn to students. To generate student learning motivation in the classroom, which is done by the teacher is: provide a direct assessment and give praise to students who ask or answer. In the learning activities, motivation is one of the factors that determine the success of student learning, in addition to characteristic factors such as the initial ability and attitude of students to subjects and teachers.

Motivation is a function of task stimulus, and encourages students (individuals) to try or strive for success or avoid failure. The motivation to learn is "Internal and external encouragement to students learning to change behavior, generally with some supportive indicators or elements".

Based on the results of research the use of learning strategies can improve student learning motivation to facilitate the achievement of learning objectives. This is in line with Nurdjito's research that the use of advanced engineering practicum approach approach with Pretest application approach and preparing the Work plan and the use of standard module can encourage the motivation, independence and readiness of learning and the attitude of student learning cooperation increased and effective, so that the achievement of advanced materials laboratory students with mastery of advanced engineering materials competence (Nurdjito, 2013).

**The results of the Implementation of the Strategy of Submission of Learning Productive lesson**

In this study, researchers revealed the results of the implementation of delivery strategy of learning productive lesson. Based on the observations of researchers, the results of the implementation of learning strategies productive lesson made by teachers can improve student achievement. This can be seen from the average value of students from each class in the location of the study based on documentation studies, observations and interviews conducted by researchers. Achievement can be interpreted as an educational assessment of student progress and progress regarding the mastery of the lesson material presented to them and the values contained in the curriculum.

Achievement will not work as long as a person does not perform an activity, because the achievement must struggle with various challenges. Adapaun value seen is: daily test value, the value of the task and the value of UTS Semester UTS Exam. Preparation of daily test questions is carried out at the end of each subject, and at the end of the second subject. The semester midterm (UTS) is an activity undertaken by the teacher to measure student achievement after performing eight to nine weeks of learning activities. Repeat coverage includes all indicators that present all basic competencies in the period.

Based on the result of the research, the students' learning achievement in the study sites increased after applied the learning strategy of productive lesson by each class teacher. The average grade of productive lesson per class shows above the Minimum Exhaustiveness Criteria (*Kriteria Ketuntasan Minimal*/ KKM) score of first and second class productive lesson. It shows that the strategy of applying the learning of productive lesson applied

by the classroom teachers from each of the research locations is paying off. Thus the learning strategy can be used as an effort to achieve student competencies that have been planned effectively and efficiently.

The learning strategy has a positive effect on student learning outcomes. This is in line with the research Aini & Sudira (2015) that based on the data analysis results show that the learning strategy variables obtained the highest score achieved by students of 98, the lowest score of 32. From the statistical calculation obtained mean/M (62) 86, Medium of 63, Mode (Mo) of 65, and standard deviation (SD) of 13.55. Ideally the lowest score of 21 and the highest score 105 to obtain the ideal ideal (Mi) of 63 and the standard deviation (SDi) of 14. This is also in line with the results of research Martubi and Amir Fatah that Achievement learning CAD students in classes treated learning strategies using the "Word Tree" command in the Auto CAD Program is better than the CAD student learning achievement in the untreated class with the "Word Tree" command in the Auto CAD Program (Martubi & Fatah, 2010).

Position of learning strategies in the interaction of the process of interaction or interrelated processes conducted between teachers with students in the learning process. Learning strategies that include the interaction between educators and learners is one of the factors of success in learning. A key element in applying learning strategies is teachers, where teachers should design procedures to interact with students, manage the learning environment and provide students with opportunities to engage in learning.

This is in line with the results of research from Mursid (2017) that the development of learning models in this case the strengthening of vocational life skills with entrepreneurial knowledge is the development of learning materials by using learning models of vocational life skills reinforcement with entrepreneurship with learning tools that accompany it, in the form of modules, learning strategies , learning methods, as a form of pre-sentation (presentation) by considering the aspects of learning and media as a collaborative and constructive learning message design principle refers to constructivism in learning.

The same thing was also conveyed by Mutaqin et al in applying cooperative learning strategy in the eyes of the installation of lighting training by using innovative interactive media, it was found that the learning method used with interaction group discussion method of learning gave the highest score (Mutaqin, Maryadi, & Haryanto, 2009).

**Research Findings**

From various data exposes in vocational high schools on learning strategies of productive lesson the following general findings of the study may be presented.

Based on the above research finding diagram (Figure 1) can be explained as follows.

***Plan***

a) The design of delivery strategy of learning productive subjects made by teachers through the process of selecting instructional media that is adapted to the objectives and standards of competence of productive subjects.
b) The principle of selection of instructional media is the effectiveness, interactivity and flexibility of learning media.
c) Selection of structure or learning adjusted to the situation and conditions, characteristics of students, learning resources and media.
d) The design of the delivery strategy that the teacher makes is composed of syllabus and RPP.

***Action***

a) Implementation of learning productive subjects conducted in schools have been referring to the rules and rules that have been established in every activity or learning process in an educational institution.
b) Implementation of learning strategy of productive subject by teacher is started with preliminary activity starting with prayer followed by apresepsi then explaining material to student.
c) At the time of the learning, the strategy used by the teacher is the use of learning media by demoting to the students in front of the class. The teacher utilizes instructional media and gives students the flexibility to express themselves. The learning process aims to facilitate students in classroom learning.

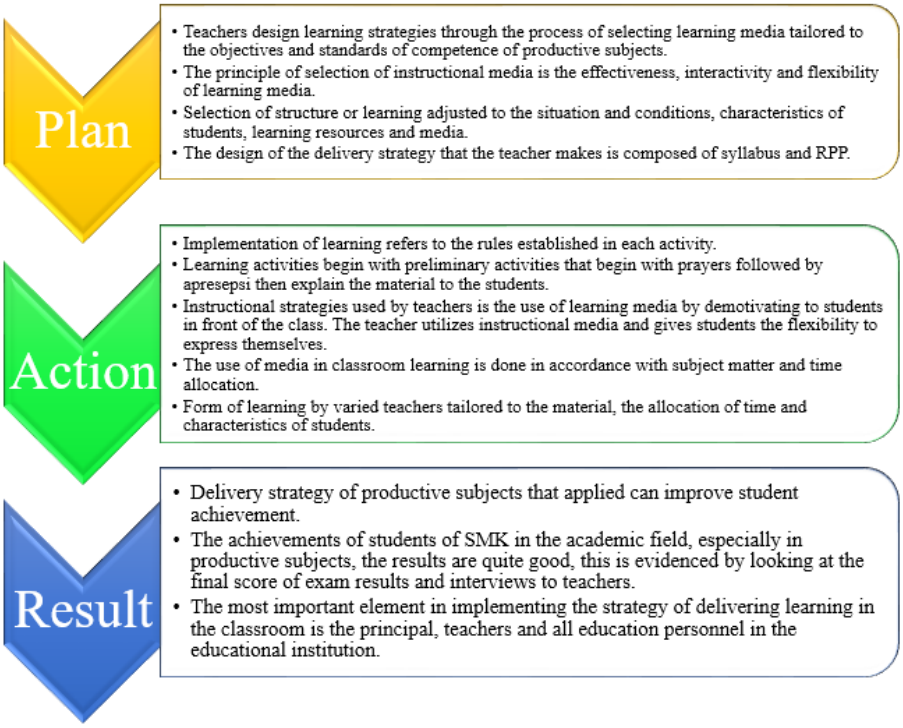


Figure 1. Reseach Findings

d) The use of media in classroom learning is done in accordance with subject matter and time allocation.
e) Form of learning by varied teachers tailored to the material, the allocation of time and characteristics of students.
f) Form of classical learning is a common strategy used in applying the delivery strategy of learning productive subjects in school.

***3) Result***

a) Delivery strategy of productive subjects that applied can improve student achievement.
b) The achievement of the students of SMK in the academic field, especially in productive subjects according to the researcher's observation, the result is quite good, it is proven by looking at the final score of test result and interview to the teacher.
c) The most important element in carrying out the delivery strategy of learning in the classroom is the principal, classroom teachers and all education personnel in the educational institutions.

From various data exposes in Vocational High School school about learning strategy of productive subjects in improving student's learning achievement, can be put forward special findings of research as follows:

a) In the delivery of learning productive subjects in the classroom, teachers design and modify the material presented to the students by providing problems in everyday life related to the material and convey in simple language for easy understood learners.
b) Teachers involve students taking an active role in the process of learning activities by requesting to provide immediate responses and summarize lesson messages.
c) Teachers provide special guidance to students who have difficulty understanding the material individually.

## CONCLUSIONS

Based on the results of field research conducted by researchers, it can be drawn conclusion as follows:

First, the design of delivery strategy of productive lesson by teachers is by designing learning strategy by involving media.

Second, implementation of learning productive lesson that have been done has been referring to the rules and rules that have been planned and defined in every activity or learning process in an educational institution. At the time of learning activities productive lesson take place, the strategy used by teachers is the use of learning media by demotivating to students in front of the class.

Third, implementation of delivery strategy of learning of productive lesson applied by the teacher from each of the research location is paying off. The average grade of productive lesson per class expressed above the Minimum Exhaustiveness Criterion (KKM) score of productive lesson.

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# EDUCATION MEDIA DEVELOPMENT FOR CLUTCH (EMC) IN VOCATIONAL EDUCATION: THE CONCEPT OF CLUTCH WORK

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Abstract

*This development research aims to describe the working concept of EMC with VPE valuation method. The EMC quality is based on following aspects: (1) valid according to experts; (2) practical according to practitioners; and (e) effective based on students ability test. The developed cycles and procedures refer to the ADDIE model (analysis, design, development, implementation, and evaluation). Data was collected using rating scale sheet (1-5) and percentage of learning using EMC outcomes. The research results show that the valid and practical aspects of the category are valid and practical enough with an average score of 3.68 (73.6%) and 3.75 (75.0%) respectively. While the results of the effective test obtained an average score of 3.74 (74.8%) and the competence test results is 80.51%. The advantages of EMC are attractive design, practical size, and ease of use (user-friendly). Students recommend that they enjoy learning with EMC and it supports learning about chassis.*

**Keywords:** *EMC, VPE, and clutch*

## INTRODUCTION

Learning is an interaction process of knowledge transfer (Duangchant, Kiattikomol, & Kaewkuekool, 2016) between teacher and students to achieve *learning outcome*. The success of the interaction process is indicated by changes in the students' mindset and also behavior into a better state than before.

The knowledge transfer process takes place in a quite complicated manner. This means that the process of information and messages exchange between teacher and students is influenced by many factors. However, good communication requires appropriate tools or media that supports quick and accurate information exchange. In relation to this requirements, teachers must be able to choose the appropriate tools.

Tools in the form of educational media that is suitable with the characteristics of competence being taught and of the students, will give good learning impression, message and experience. In addition, the tools in the learning process is used to facilitate comprehension about the subjects delivered by teacher (Sugiarto, 2010, p.7) so it can be accepted easily by students in the form of fresh and in-depth learning experiences. The tool can be either visual or non-verbal media. The media used, when it involves all the senses, will achieve much higher success rate. In addition, the media can be functioned as a translator or to expand the boundaries of a process that can't be seen directly by the senses. So this kind of media should be able to simulate the process itself.

Mechanical engineering education program has class for competency theory of chassis, and chassis practice which has 4 credits. The expected graduate competence is to master the factual, conceptual, procedural, and meta-cognitive dimensions of knowledge and implement them on real conditions. Understanding the factual and conceptual dimensions is relatively easier, but on the other hand, understanding the procedural and even Meta-cognitive dimensions is trickier. Some principles can't be observed by the senses directly, for example the work of clutch involving the motion of several components. The process of change of each components cannot be observed directly but the result of the working principle can felt. Those dimension levels can lead to students' misconceptions, because the working components are concealed inside the *clutch housing*.

Below is the observation result showing the grades of understanding for 34 PTM 2014/2015 students on chassis competence: clutch based on the gradation of factual, conceptual, procedural, and Meta-cognitive dimension, before using Education Media Clutch (EMC):

Table 1. Learning Results before EMC

| Knowledge Dimension Gradation and Competence Indicator | IC | C |
|---|---|---|
| *Factual Knowledge Dimension* | | |
| a. Clutch location/position | 24% | 76% |
| b. Clutch components | 56% | 44% |
| c. Clutch types | 38% | 62% |
| Average | 39% | 61% |
| *Conceptual Knowledge Dimension* | | |
| a. Clutch dismantling steps | 59% | 41% |
| b. Clutch measurement steps | 71% | 29% |
| c. Clutch assembling steps | 65% | 35% |
| Average | 65% | 35% |
| *Procedural Knowledge Dimension* | | |
| a. Doing clutch dismantling | 76% | 24% |
| b. Explaining clutch work process in real condition | 76% | 24% |
| c. Measuring and repairing clutch | 88% | 26% |
| d. Assembling clutch without damaging | 88% | 26% |
| Average | 79% | 21% |
| *Meta-cognitive Knowledge Dimension* | | |
| a. Dismantling, measuring, and assembling with proper procedure | 88% | 12% |
| b. Repairing clutch on other vehicle | 100% | 0% |
| Average | 96% | 4% |

Note: C: Complate and IC: Incomplete (Source: Document of Chassis Competence Test Result, 2017)

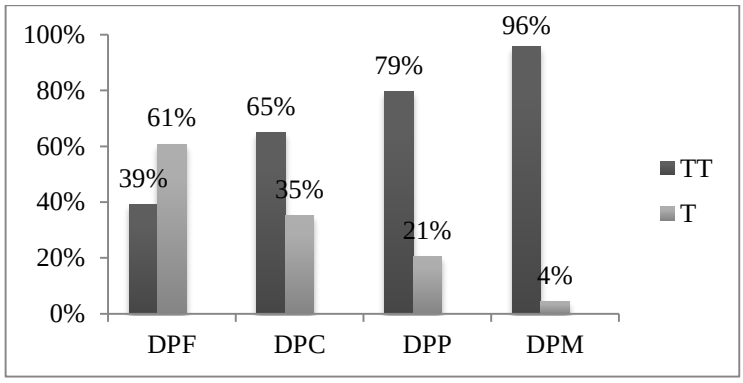



Figure 1. Diagram of Learning Result for Gradation Clutch Knowledge Dimension

Based on the learning outcomes shown in table 1. Students in the complete category for factual dimension is 61%, conceptual dimension is 35%, but only 21% for procedural dimension and 4% for metacognitive dimension. For the knowledge dimension of factual and conceptual, students can learn their clutch competence from the observation using their senses, while the procedural knowledge dimension about the process cannot be observed directly with the senses. This condition suppresses the students' learning motivation. Moreover, the metacognitive dimension can notbe implemented properly, because it requires special skills beyond the previous three dimensions.

The abstract and limited natures of verbal media (images, video, text, etc.) make clutch competence has not been maximum. Therefore, it needs a media that can deliver the information easily, effectively and feasible. This leads to the development of clutch Media Education by showing the working components of clutch that can be observed directly. The procedure developed in EMC is cutting the media without damaging the mechanism of motion. This process requires good planning and implementation.

As a solution for those problems, it is required to have tools or media that can overcome the limitation or space boundary to make students understand about the concept of how centrifugal clutch work. The required media is the media which has the same concept with the original object. So it takes research of EMC development with VPE method.

EMC comes in many varieties, shapes and characteristics. EMC clarifies the abstract message (Sangsawang, 2015) to become concrete message, thus facilitating the understanding of concepts. Therefore EMC helps students to understand the application of a learning material in a different way in the learning process (Hidayati & Wuryandari, 2012; Sugiarto, 2010, p. 7).

The first development of education media in the field of education was in learning mathematics. The reason was to facilitate mastery of the logic concept for students, because without the tools the thinking process would take longer. In the same way, EMC is needed in automotive learning for complicated systems or mechanisms. Through EMC those complicated system or mechanism is made simpler so the mastery of concept can be more focused. This is possible because the system is separated from other systems. In addition, EMC does not reduce the learning objectives to be achieved and clarifies certain parts of the automotive field that cannot be observed directly. So the principle of EMC is to simplify the parts of the component or system by removing it from the original position without changing the working mechanism, and it is used to facilitate understanding in the learning concept.

EMC to be developed is the diaphragm type clutch or also called with friction clutch. Diaphragm clutch is the most used practice media in automotive vocational education. This means that this type of clutch is already taught before. In addition to being easy to obtain, this type is not so complicated compared to hydraulics, magnets, and torque converter types.

The purpose of EMC is to improve the quality of learning, meaning the quality of

learning can be increased. Also, learning can be more effective, focused, attractive and also can improve the students' metacognitive. The main benefit of this media is eliminating the abstract or imaginative nature. If students are taught only verbally then their abilities are verbal also, while the ability to understand the concept is very poor. Thus, these problems will be solved by using EMC and students can learn through direct experience (experiential learning) that will result in a good metacognitive concept (Murti, 2011).

The field of engineering needs innovation in its education to build a conceptual understanding, one of which is EMC. Researches that have been conducted in other fields include (Hermanto & Margo Sulistyo, 2012). The result of this research concluded that the use of power window panels can improve student learning outcomes than without power window panels. (Wicaksono, Hadromi, & Masugino (2013) with research of Application of Motorcycle Lighting System Display Panel increased by 26.74 (58.5%). Rahmawan, Widjanarko, & Wahyudi (2012) props of charging system based on circuit work can increase student learning outcomes by an average of 8.64 or 18.2%. (Nopilar & Saputro (2011) with research on The Implementation of Ignition System Display Panel observed an improvement in the understanding by 27.33 (57.33%). Based on the results of the above researches, it can be concluded that the media developed are the same that is media props. It was developed for other competencies and the results are an increased outcome. The visual props developed for this research is EMC, to provide new benefits and innovations and improve positive perceptions. According to Shabiralyani, Hasan, Hamad, & Iqbal (2015), the majority of the teachers and students have positive perceptions of the use of visual aids. This research focus on the development process and assessment of props to be used as EMC.

The above reasons support the argument for auxiliary role without changing the principles, working mechanisms or component forms, but facilitate in understanding the material (Sastradiradja, 1971, p. 4). The impact of teaching aids is improving memory comprehensively and profoundly (Li, Tan, Teo, & Wei, 2012) and improving critical thinking and problem-solving skills as well (Kadlowec, Lockette, & Bukumaran, 2002).

**Education Media for Clutch**

Clutch is a member of chassis group located between flywheel and transmission. The function is to adjust the power that is transmitted from the engine to the transmission and then the transmission changes the machine speed as desired. The way it works is to disconnect and connect transmission rotation in quick, smooth and gentle manner (Chen et al., 2017) taking into account the coefficient of friction (slip) (Arndt, Tarasow, Bohn, Wachsmuth, & Serway, 2016) to provide comfort for the riders (p.80). In addition, the purpose of clutch is also to reduce the time of gearshift and smooth clutching process without any torque reduction (van Berkel, Hofman, Serrarens, & Steinbuch, 2014). Its location is inside the clutch housing, which makes the mechanism of the working components cannot be observed directly. Diaphragm clutch mechanism consists of several moving components including: (a) fly wheel, (b) clutch disc, (c) pressure plate, (d) clutch cover, (e) spring diaphragm, (f) release bearings, (g) release fork. The mechanism of each component is interrelated during its operational moments. However, the process is not observable directly which results in the difficulty to provide direct understanding and comprehension to students.

**Development of Education Media**

The process of knowledge transfer needs supporting media to facilitate the acceptance of conceptual understanding and information storage in a relatively long period of time. In the world of education, especially vocational education, supporting media is needed. The nature of the material that is abstract, limited to theoretical and imaginative explanation without involving the senses, makes the role of supporting media as learning solutions. This learning support is what is meant by teaching support tools.

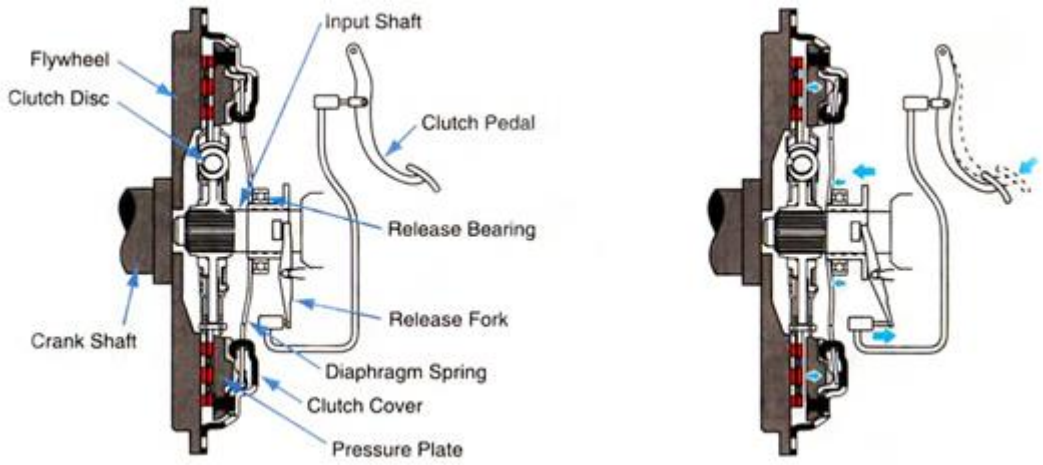



Figure 2. The concept of clutch work (a) the coupling position is connected, and (b) the clutch position is detached

The teaching aids is the educational media acting as learning stimulus, which can be absorbed by eyes and ears with the purpose of supporting the learning process, (Sudjana, 2009, p. 59) to improve the students' competence, (Riyadi, n.d.).The props also referred to as a supporting tools which means that the learning process does not have to use props as the messenger. It is not enough for the learning process to rely on props alone, there must be someone who communicate the material to avoid *trial and error* and wider understanding beyond design. The learning aids serves as a means of communication and interaction, (Arsyad, 2011) to deliver informations, (Widiyatmoko & Pamelasari, 2012), in the form of description about the work mechanism of an object, (Husnul, Nurhayati, & Jumadi, 2015), so as to stimulate the students' mind, feelings, interests and attention.

The function of props has been explained by Sastradiradja (1971, pp. 1–3), those are: (1) helping students to learn more, (2) helping students to remember more, (3) bringing effective stimuli for learning, (4) making learning to be more concrete in nature, (5) bringing the outside world into the classroom, and (6) giving sharp image approaches from the same subject.

The benefits of learning using props (Aji, 2016) are as follows: (a) allows for direct interaction between students and the environment; (b) can produce uniform observations by students; (c) instilling the basic concepts that are true, concrete, and realistic; (d) stimulating new curiosity, joy, and interest; (e) generating motivation and stimulating student to learn; (f) providing an integral experience from a concrete entity to abstract; (g) help remember longer; (h) bringing the world into the classroom

Good props must fulfil several criteria (Sastradiradja, 1971, pp. 4–7), they should be designed based on consideration of teacher conditions, should be simple, clear and in correct form so they will not be confusing. The requirements that should be met from a learning aids are rational, scientific, economical, practical and functional. They are stressed by Sundayana (2015, p. 8) that the requirements and criteria for education props are durable, attractive in shape and color, simple and manageable, of appropriate size, can present the concept, in accordance with the concept, clarify the concepts and basic concepts of abstract thinking.

The props can be in the form of real objects, drawings or diagrams. The advantages of real object props are movable or able to be manipulated, while their weaknesses are the fact that they cannot be presented in a book or in writing. Educational props is a visual tool developed from its original form into a simpler view with the objective of facilitating comprehension in learning. The development should be done when learning on the actual conditions is very difficult to stimulate cognitive understanding. The props are made

to anticipate limitations of senses in learning. The position of visual aids is as a factual, conceptual, procedural and metacognitive translator that is modified as requirement.

Implementation of educational tools for diaphragm type clutch is based on several strong reasons: (a) clutch working mechanism cannot be observed directly, (b) the location of clutch is complicated as a medium of understanding the concept, (c) requires a relatively long time to understand the components, (d) integrated with other system (transmission and fly wheel), (e) explanation using images, without seeing the real thing, is not enough.

**EMC Assessment Using VPE Method**

EMC development must follow a standard or fulfil the eligibility to be used in learning. The standard is intended to ensure that the values and purposes of the learning objectives are met. The process of obtaining this standards is called (Fatkhurrokhman, Permata, Ekawati, & Rizal, 2017) validation, practical and effective aspects of the EMC media and is carried out by someone skilled in the science or substance or practitioner and user (Fawaid, Nurhaji, Nurtanto, & Ramdani, 2017). Expert validation is used to test the validity of props (Amin Fatah, 2015). The teaching aids as educational media simulation is considered valid after testing by experts, practitioners and users (Nurtanto, 2016).

Expert validation test involves several experts from universities in automotive field, training center that is BBLK Serang for automotive and LSP Atom for automotive as competence expert in this field. The practitioner's test involves the practitioner experts who are teachers and lecturers for the chassis subjects or competence. And the effective test is done through small or limited group test, involving students as users. They are from PTM-Untirta.

The EMC assessment was based on media criteria and requirements of props that are grouped into four aspects with each expert of different indicators. Thevalidation aspects in question are (a) display, (b) size, and (c) use of props. Practical aspects are (a) conformity of mechanism, (b) coupling performance, and (c) conformity of coupling manual. The effective aspects are based on (a) attractiveness, (b) the benefits of EMC, and (c) convenience. Next, EMC is tested against the students' competence with indicators (a) the factual dimension, (b) the conceptual dimension, (c) the procedural dimension; and (d) metacognitive dimensions. Each aspect must either exceed or above "enough". This means that the media has met the requirements criteria to be used as a media simulation in education, especially on clutch competence in vocational education.

**RESEARCH METHOD**

The type is Research & Development with the aim to develop EMC on clutch work. The orientation of this development research is to produce a valid and feasible EMC product for use in the learning process.

The development steps adapt the ADDIE model which has five stages, namely: Analysis, Design, Development, Implementation and Evaluation. This model is selected because (Abd Rahman, Ismail, & Nasir, 2014; Cheung, 2016; Linh & Suppasetseree, 2016) ADDIE is an appropriate model for development research due to its sequential and interactive development process, in which the evaluation of each stage can bring learning development to the next stage.

EMC's development cycle and procedures are as follows Figure 3.

Subjects in this study are based on the VPE method. Valid EMC is then tested to 5 media experts. Practical EMC is tested to the user of 7 teachers and lecturers. And then Effective is tested based on the 30 students' competence.

The quantitative data obtained is then analyzed (Sukardi et al., 2007), by presenting the percentage (Mardapi, 2008, p. 94) and descriptively converted (BEHERA, n.d.), according to Likert scale (1-5) and percentage of competence test results.

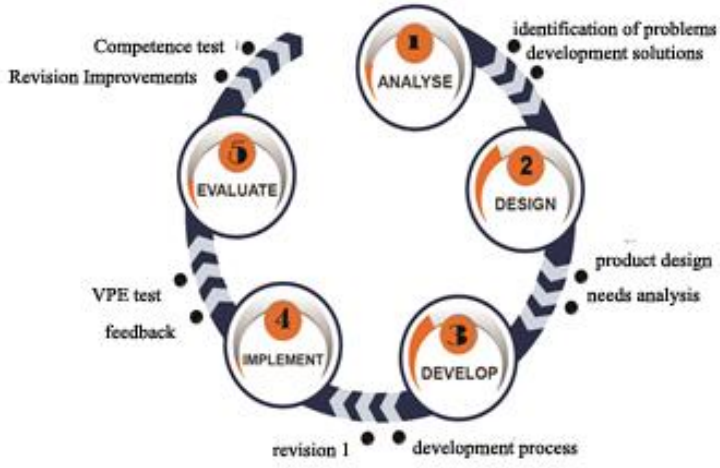



Figure 3. ADDIE Cycle on EMC

## RESULT AND DISCUSSION

After the development phase using ADDIE and the product has met the requirement analysis, then it is tested to expert, practitioner and user of EMC. The results obtained as follows Table 2.

Based on Azwar (2013, p. 93) criteria, the rating category are as follows: if 4.9 <X, then it is categorized as very valid EMC; if the score is 4 <x ≤ 4.9, then it is categorized as valid EMC; if the score is 3.2 <X ≤ 4, then it is categorized as EMC quite valid; if the score is 2.3 <x ≤ 3.2, then categorized as invalid EMC; and if the score is X ≤ 2.3, then it is categorized as very invalid EMC. Based on Table 2 the average is 3.68. Therefore EMC is quite valid or sufficient to meet the requirement.

Table 2. Result of EMC-Valid Test

| Assessment Valid Aspect | Indicator | Average Score (1-5) |
|---|---|---|
| 1. Display | 1.1. Attractive Design | 3,8 |
| | 1.2. Suitable Color | 3,6 |
| | 1.3. Correct Component Layout | 3,4 |
| 2. Size | 2.1. Practical Size | 3,8 |
| 3. Use of Props | 3.1. Easy to Use | 3,8 |
| | 3.2. Save to Use | 3,4 |
| | 3.3. Average Score | 3,68 |

Table 3. Result of EMC-Practical Test

| Assessment Practical Aspect | Indicator | Average Score (1-5) |
|---|---|---|
| 1. Mechanism Conformity | 1.1. Props Mechanism conforms | 3,6 |
| 2. EMC Performance | 2.1. Tools and components work well | 3,4 |
| 3. Manual Conformity | 3.1. Simulation for worn out clutch | 4,2 |
| | 3.2. Simulation for clutch gap adjustment | 3,8 |
| | 3.3. Simulation for movement mechanism | 3,2 |
| | Average Score | 3,75 |

Table 4. Result of EMC-Effective Test

| Assessment Effective Aspect | Indicator | Average Score (1-5) |
|---|---|---|
| 1. Attractiveness | 1.1. Attractive Design | 3,8 |
| | 1.2. Fun to Learn with | 4,2 |
| | 1.3. Interesting use of Color | 3,4 |
| 2. EMC Benefit | 2.1. Motivates Learning | 3,6 |
| | 2.2. Helps with the comprehension | 3,8 |
| | 2.3. Support the learning process | 4,2 |
| 3. Convenience | 3.1. Props usage | 3,2 |
| | Average Score | 3,74 |

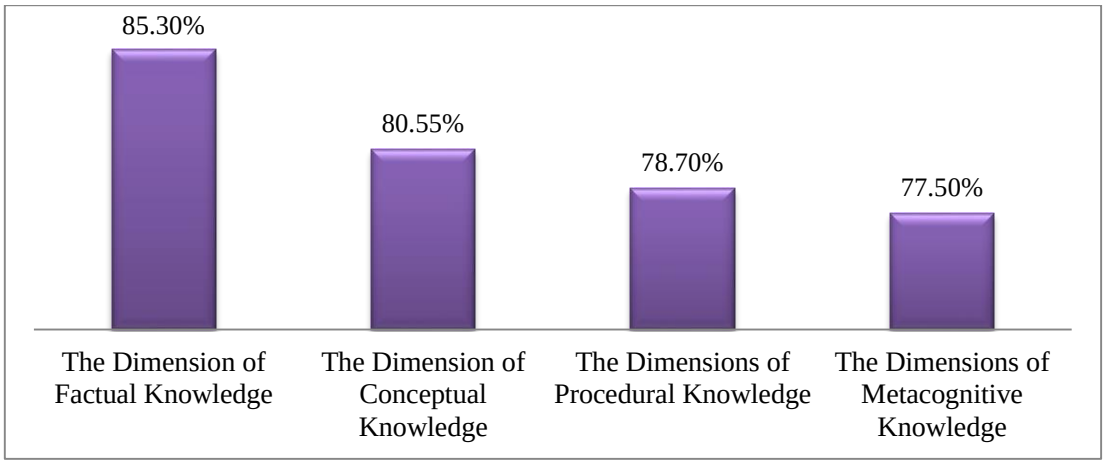


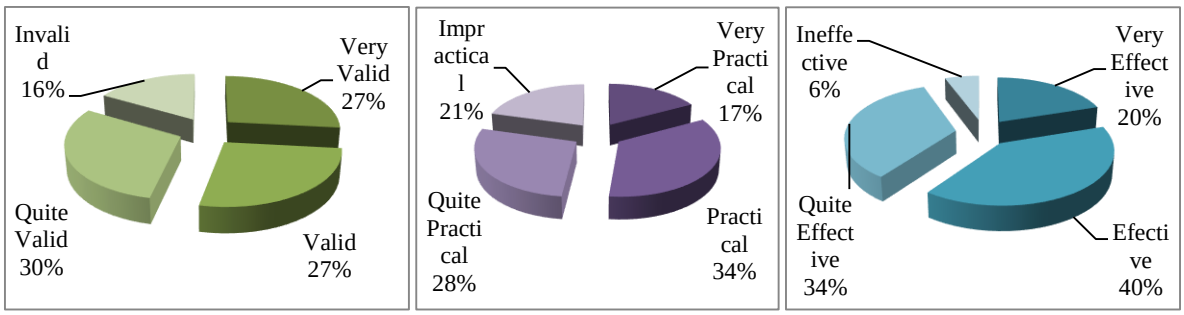

Figure 4. EMC-Capacity Test Results Diagram

Based on Figure 4. (a) There are 16% EMC is invalid, (b) 21% EMC is impractical, and (c) 6% EMC is ineffective. Thus some do not meet the criteria. The causes include: the developed product does not fully have an attractive design, even EMC cutting size is still very minimal or limited. In addition, the EMC's working mechanism demonstration is not yet in line with engine performance. From the EMC-practical testing, the average of 3.75 (75%) is in the category of quite practical. While the EMC-effective test obtained average 3.74 (74.8%) that is quite effective category. The results used in the EMC capability test obtained an average of 80.51 in the "good" category. The overall distribution and percentage can be observed in Figure 5.

The application of EMC to the concept of clutch work has fulfilled the requirement that it is tested to 5 expert practitioners. Assessment criteria are well measured including display, size and use of EMC. The results obtained in the category are quite valid, so that EMC can be used as a learning aids or developed further based on recommendations. The advantages of EMC based on expert testing are as stated: attractive design, practical size, and easy to use.

Based on the requirements when tested by the user or practitioner, the result obtained is higher that is 3.75 (75.0%) on scale 1-5 and increased 0.70. The advantage of EMC is at the simulation of worn out clutch that has 4.2 score (scale 1-5). It supports the metacognitive knowledge dimension, meaning that it can be applied to EMC.

When tested to the user through a closed statement, average score obtained is 3.74 (74.8%) on scale 1-5. Students recommend that they feel that they are learning something using EMC and that it supports their chassis learning.




(a) (b) (c)

Figure 5. (a) Distribution of EMC-Valid, (b) Distribution of EMC-Practical, and (c) Distribution of EMC Effective

After requirements have been fulfilled, then the Tests that refer to the level of knowledge dimensions that have been described previously is conducted. The average score obtained is 80.51%. This indicates that the competence dimension can function well. Props, as a media EMC simulation, is feasible to be used and able to improve student's comprehension. Research conducted Wibowo et al.(2016) concluded that Virtual Media on physics learning provides comprehension to students and improves learning outcomes effectively (Sukir, Soenarto, & Soeharto, 2017). It is also supported commercially by (Gudipadu, Sharma, & Singh, 2015) by studying the effects of media under different conditions, this is in line with the concept of coupling with the concept of abstract work based on its position.

## CONCLUSIONS

Based on the results of EMC development for competence in chassis theory and practice using ADDIE approach, the simulation media of EMC produced can fulfill the valid, practical and effective requirements as well as support the knowledge dimension: factual, conceptual, procedural, and metacognitive. The developed EMC has the following qualities: (1) the assessment performed based on valid test indicates that EMC is "valid enough" with score of 3.68 (73.6%); (2) the assessment based on practical tests indicates that EMC is "practical enough" with score of 3.75 (75.0%); and (3) assessments made under the effective test, the score is 3.74 (74.8%). After tested for comprehension in the clutch competence using EMC, the average dimension ability is 80.51%.

The advantages of developing EMC based on test results are attractive design, practical size, and easy to use to support metacognitive knowledge dimension. Students recommend that they feel like learning to use EMC and it can support in chassis learning, especially in improving dimensional comprehension.

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# DEVELOPMENT OF MASSIVE OPEN ONLINE COURSE (MOOC) BASED ON ADDIE MODEL FOR CATERING COURSES

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Abstract

*Nowadays, innovation for teaching aids is an important requirement to ensure the teaching and learning process can run smoothly. Coinciding with the Malaysia Education Blueprint 2013-2025 (Ministry of Education) through the ninth surge of Global Online Learning, the development of the Massive Open Online Course (MOOC) was built. The ADDIE model has been adapted for this development. The study aims to develop an appropriate interactive learning for Food and Beverage Presentation subjects based on the Vocational College (VC) syllabus. In research development, researchers use Richey and Klein research recommendations, using Alpha and Beta tests in the evaluation phase of the study. The population of the study involved 155 Catering students at Muar Vocational College and the sample of the study were 60 of third and fourth-year Diploma students. The sampling method used is the purposive sampling and the instrument used in the form of the questionnaire. Data collected were collected and analyzed descriptively using Statistical Packages for Social Science (SPSS) version 23.0. Based on the analysis, the reliability value of the instrument is 0.997 and shows that the reliability of the instrument is at a high level. The findings show that the use of MOOC can increase computer literacy (3.75), interest (3.78) and student learning styles (3.75) and make the learning process more interesting. In addition, the findings show that the use of the MOOC application can help students in improving the performance and achievement of students in learning and thus can be an alternative to diversifying the teaching and learning process in VC.*

**Keywords:** *MOOC Literacy, Interest, Learning Style, ADDIE Model, Catering, TVET*

## INTRODUCTION

Technical & Vocational Education and Training (TVET) Malaysia has been empowered by Ministry of Higher Education (MOHE) of Malaysia to improve the image and quality of Malaysia TVET education towards World Class Education (Minghat, Yasin, Subari, & Noordin, 2013). TVET aims to develop students' skills, abilities, and understanding of real-world employment and prepare skilled manpower for future use (Aziz, Ramli, & Othman, 2014). According to Osman (2016), through Technical and Vocational Education, the skills majors can contribute to a knowledge-based economy, technology and mobility of the workforce. Students who want to continue their studies towards skills-based education, they can choose the vocational college to understand, learn and explore the skills there.

Information and computer technology greatly influences the lives of society today. The emergence of computer technology and modern communication tools can help people to collect, process and handle information easily and systematically (Anggraini, Mukhadis, & Muladi, 2013). Teachers are now encouraged in computer literacy so that knowledge in the 21st century can be explored and utilized in the P & P process (Penny, Friston, Ashburner, Kiebel, & Nichols, 2011). The use of computers is increasingly important in everyday life, whether in the office or at home. Vision 2020 faces the challenges of life-based on science and technology as one of the key agenda (I. M. Bin Ismail, 2005). One of the implementation of ICT in learning is electronic learning (Priyanto, Sofyan, & Surjono, 2017). Utilization of the Internet in the form of web-based learning media is one form of e-learning which in this era is popularly developed by various educational institutions (Hardyanto & Surjono, 2016).

Online learning with the valid and structured material is important for students in the achievement of learning objectives Prastiyo, Djohar, & Purnawan (2018). MOOC is an online learning course whose participants are unlimited and can be accessed openly through the website. According to Aris & Halim (2016), Massive Open Online Course (MOOC) is an online course aimed at massive interactive participation and open access through websites. MOOC is an online learning accessible to everyone around the globe for free (Kop & Carroll, 2011). MOOC is a global online learning capable of accommodating student capacity on a large scale (Nordin, Norman, & Embi, 2016). In fact, the field of skills is an important field especially for developing countries to prepare for the 21st century (Bakar & Latif, 2010).

Not only that, Abidin (2014) stated that attitude or interest in teaching and learning process could be embedded in digital literacy practices for all academic institutions to support the concept of e-learning as an effective learning method. Additionally, this is in line with the needs of the country's e-learning policy and 21st-century education that highlights student-centered learning.

Based on the background of the problem, a new culture in ICT or e-learning is one of the effective teaching approaches and can help teachers by diversifying teaching methods to facilitate students to understand while helping teachers to carry out their teaching smoothly and in order. Additionally, teachers can achieve outstanding student achievement and create their success much easier (Abdullah, 2010). This new development has created a new flexible learning environment in terms of time, place, method and learning materials (Othman & Mohamad, 2014). They need to act and react to explore these interactive and digital methods in learning (Gan, Menkhoff, & Smith, 2015).

The use of the MOOC especially among academics helps increase the motiva-tion and interest among students who are still fading in e-learning (Yahya, 2013). The world is growing in e-learning. Thus, this learning allows students to learn anywhere and at the time chosen by the students. This allows students to manage their own time more effectively. This virtual learning also involves the use of optimal costs. In addition, interactive learning styles online allow students to explore new information through digital libraries or websites (Pappano, 2012). Therefore, students can work in groups or individually to view and collect information, analyze and evaluate information obtained directly through an e-learning platform. As more and more technologies are introduced in the field of education, this treasure of knowledge can provide and disseminate information and knowledge globally.

The objective of this study is to study the following: (a) develop MOOC platform for use in learning; (b) to test the functionality of using the MOOC learning platform; (c) MOOC literacy among students towards MOOC usage; (d) the interests of students towards MOOC usage; (e) the student learning styles towards MOOC usage.

## METHODOLOGY

In the research development, this research was used Richey & Klein (2014) development design, which uses Alpha and Beta testing in the evaluation phase of the study that software or products developed should apply appropriate models to help students solve problems and improve student performance. This product uses product development design. The model used to design this project is ADDIE Model. According to Richey & Klein (2014), there are five (5) phases in this model is analysis phase, design phase, development phase, implementation phase and evaluation phase. This model was chosen based on the approach to the development of the study by solving the problems arising from the early stages.

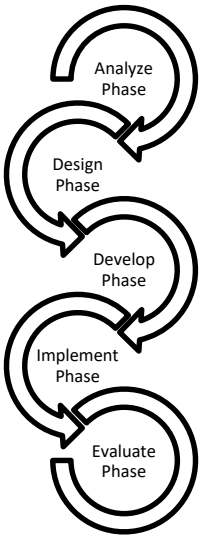


Figure 1. ADDIE Model

### Analysis Phase

At this stage, the analysis phase involves several determining processes and identifies the problems that need to be resolved. After a problem can be identified an analytical process will be carried out to find out what causes or factors are related or that cause the problem. The analysis process covers the problems faced, product requirements include the objective of developing the product (Halim et al., 2012). In addition, the phase of analysis is the basis of all phases in this instructional design model. To develop the MOOC for catering programs at the Muar Vocational College, researchers have set some research objectives as in 1.4. Based on the objective of the study, researchers need to design an interactive learning through the MOOC, develop it as one of the ABBM and test the level of flexibility in its use in learning. During this phase, the researcher set user targets for the development of this MOOC. Among the main focus of the target are educators in catering and respondents for this study which consists of students of catering programs, especially Vocational College of Muar, Johor.

### Design Phase

At this stage of the process, it explains the overall view of the design, structure, teaching approaches, types of media and technologies to be used, content and script/storyboard. This phase is crucial for planning strategies in developing teaching and outlining how to achieve teaching goals.Development needs to acquire appropriate learning objectives and it should be based on the use of learning materials in Vocational Collage according to the prescribed syllabus. In addition to learning notes, the design of activities, training and quizzes/tests should also be developed. According to Lee, Hsieh, & Hsu (2011), development should be appropriate and check the way or method of delivery of information in the software to be more user-friendly. Among the things that need to be emphasized in this design phase are content design and script/storyboard design.

### Development Phase

This stage involves real system implementation by using all appropriate media and technology elements based on requirements. Built based on analysis and design phase. The purpose of this phase is to produce lesson plans and learning materials (Davis, 2013). During this phase will be developed, the teaching steps as well as the media to be used in teaching and other required documents. According to Hishamuddin (1987), the output in the design phase will be input to the development phase. The

multimedia project development work will be done according to the agreed-upon specifications. Each development will be tested to ensure that it is consistent and effective.

**Implement Phase**

At this stage, the teaching materials that have been prepared will be used or implemented in real terms. In this phase, testing was also made. Testing will be made on MOOC which will be developed by the researcher. The completed MOOC development project will be tested on users to identify errors during the project development process. In the event of a mistake, the repair will be made before it is fully delivered to the target user for use. All syllabus, activities, discus-sions, references, and notes will be included in the MOOC platform at https://www.openlearning.com/ in stages.

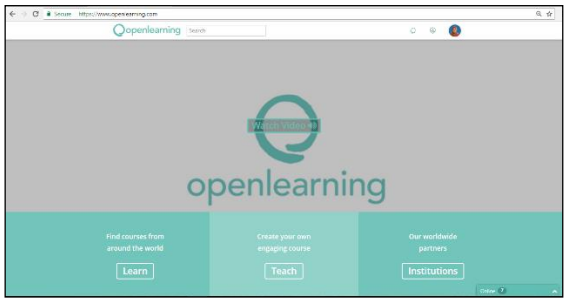


Figure 2. Open Learning

**Evaluate Phase**

This phase is an advanced phase of the implementation phase. This phase is evaluated from two aspects of assessment, namely (i) usability assessment, and (ii) conformity assessment (Nordin et al., 2016). Instead, the main purpose of this phase is to detect weaknesses and failures in the development process and operating system. As such, three experts comprising MOOC specialists, multimedia specialists and technical and vocational (catering) experts to evaluate and verify MOOC functionality developed through the expert confirmation form to be provided. Additionally, the usability of MOOC development was assessed through a questionnaire given to 60 students.

**Population and Sample Study**

According to Thomas et al. (2010), the population is the target group of researchers in which the group to whom the results will be generalized. The population in this study involved 155 students taking a catering program at Muar Vocational College. The sampling was the respondents selected to represent a population (Goodman, 2011). The sampling method that used is was purposive sampling which is consists of third year and fourth-year students taking the Diploma in Catering Arts of 60 who took the subject of Food and Beverage Presentation

**Validity and Reliability of Instruments**

Validity and reliability are important to ensure that the findings are credible and unquestionable (Csikszentmihalyi & Larson, 2014). To ensure that the questionnaire can be used, the validity must be made first. The validity used in the study is the validity of the content and the validity of multimedia. The researcher has obtained three experts to determine the validity of the questionnaire which has been developed. The three experts consisted of a MOOC expert, a multimedia expert, and professor in vocational education (catering).

The reliability of the instrument is a measure to determine the consistency of the score against each item found in the questionnaire form. This is to preserve the accuracy of the questionnaire instrument from having any problems and data obtained accurately. To see the reliability of the questionnaire, an internal methodology was used Cronbach Alpha method. Based on the analysis that has been made, Alpha Cronbach's value is 0.997 and is at a high level (Ghafar, 2003).

All the items in the questionnaire were analyzed by appraising using four-point Likert scale scores based on a very disagreeing, disagreeing, agreeing and strongly agreeing. Item analysis refers to the range of mean scores such as Table 1 which determines the level of respondents' stance on items in question.

Table 1. Mean Score Analysis

| Mean | Level |
|---|---|
| 1.00 – 2.33 | Low |
| 2.34 – 3.66 | Moderate |
| 3.67 – 5.00 | High |

**MOOC Literacy Analysis**

Table 2. shows the results of MOOC literacy which is the respondents involved in

the questionnaire by item and finds the mean result obtained is moderate and it clearly indicates that respondents agree with this item. This shows the respondents' decision to answer the first question is positive and computer literacy among catering is good.

Table 2. Data Analysis of MOOC Literacy

| No | Item | Mean | SD |
|---|---|---|---|
| B1. | I understand more about learning when using MOOC. | 3.63 | 0.486 |
| B2. | I know how to use the MOOC learning platform. | 3.68 | 0.469 |
| B3. | I am more likely to find information through MOOC's learning platform. | 3.68 | 0.469 |
| B4. | I'm more interested in learning to use MOOC than books. | 3.55 | 0.502 |
| B5. | I feel the MOOC application helps me practice SLT (Self Learning Time) | 3.65 | 0.481 |
| B6. | I am experienced in controlling the MOOC platform. | 3.67 | 0.51 |
| B7. | The information provided in the MOOC platform is clearly communicated. | 3.73 | 0.446 |
| B8. | MOOC can help improve my academic achievement. | 3.75 | 0.437 |

**Students Interest Analysis**

Table 3. shows the results of students interest towards MOOC usage. The results found that the majority respondents strongly agreed on the items given and this clearly showed that students interest in the use of MOOC for learning was high.

Table 3. Data Analysis of Students Interest

| No | Item | Mean | SD |
|---|---|---|---|
| C1. | I love learning to use the MOOC learning platform. | 3.7 | 0.462 |
| C2. | I like it when teachers use MOOC as a teaching aids tool. | 3.78 | 0.415 |
| C3. | I love to answer the questions in the MOOC. | 3.73 | 0.446 |
| C4. | I use MOOC's learning platform for all subjects. | 3.72 | 0.454 |
| C5. | I am ready to use the MOOC at any time. | 3.73 | 0.446 |
| C6. | I always take the opportunity to learn using MOOC. | 3.67 | 0.475 |
| C7. | I often use MOOC to get learning materials. | 3.68 | 0.469 |
| C8. | I feel the convenience in MOOC stimulates my learning. | 3.73 | 0.446 |

**Student Learning Style**

Table 4. shows the results of the students learning style using MOOC. The results found that the majority respondents strongly agreed on the items given and this clearly showed that students learning styles while using MOOC for learning was high.

Table 4. Data Analysis of Student Learning Style

| No | Item | Mean | SD |
|---|---|---|---|
| D1. | I often visit MOOC's website to find information. | 3.7 | 0.462 |
| D2. | MOOC helped me learn not to think time | 3.75 | 0.437 |
| D3. | I use the MOOC learning platform in daily tasks. | 3.68 | 0.469 |
| D4. | Information is easier to obtain when using the MOOC app. | 3.7 | 0.462 |
| D5. | I love to use MOOC applications in helping the learning process. | 3.67 | 0.475 |
| D6. | The MOOC app helped me to understand something learning. | 3.67 | 0.475 |
| D7. | I always invite my friends to join the MOOC app. | 3.72 | 0.454 |
| D8. | I love to learn to use the materials on the MOOC platform | 3.72 | 0.454 |

## DISCUSSION

The findings of this study show that computer literacy among catering students on MOOC application in VC Muar is at the moderate level for the whole item. This can be seen when some students agree that they know how to use the MOOC platform. According to Arsyad (2011), online e-learning sessions with computers are very easy to update as the latest content can be uploaded or downloaded to a user's computer. The findings also show that some students feel that MOOC's application helps them to practice self-learning time besides the information provided in the MOOC platform is presented clearly. Mohamad & Shariff, 2011) in their study found that online members involved in discussions and interacting effectively can set the tasks that are appropriate for them.

Besides, findings shows that some students agree that they understand more about learning when using this application. In online interaction, students are more interested in learning to use the MOOC platform than scientific books. This is supported by Manaf et al. (2015) student interaction with MOOC app is the kind of interaction between student and

interface. This is because the MOOC app makes it easier and more user-friendly because students and other users can access unlimited limits.

An interaction between students and the interface is very important because the on-line and easy-to-use interface of learning can attract students to actively participate in online learning (Manaf et al., 2015). Students are de-lighted and comfortable using computers and therefore they are more likely to seek information through the MOOC learning platform. It can be explained that multimedia has the potential to create a high-quality learning envi-ronment, with the ability to create more realis-tic learning contexts through different media (Nusir, Alsmadi, Al-Kabi, & Sharadgah, 2012).

With the rapid technology and sophisticated facilities provided in our country's institutions, it is extremely costly if not applied to multimedia elements especially the use of computers and MOOC for learning (Ismail et al., 2018). In conclusion, student acceptance of MOOC literacy is at a moderate level but needs to be improved to ensure the smooth implementation of the course using the MOOC application. The results of the analysis obtained from questions 1 to 8 have answered this question.

Moreover, this research found that the students intereted when the teacher used MOOC as teaching aids. Then, the researcher found that the use of MOOC in the teaching and learning process in the classroom was one of the teaching aids that helped the teacher to increase the interest and performance of students in a subject (Sharif, 2012). Not only that, students also love to use this platform for learning. This is reinforced by Hew (2016) Brundiers and Wiek (2010), which states the use of MOOC in the learning process allows the classroom to meet the real world and enable students to find original information and materials, facilitating collaborative and facilitating multimedia materials to be easily created and disseminated.

Furthermore, students are ready to use the MOOC platform at any time. Thus, seeking information and teaching and learning materials via the internet or the website not only helps to increase the use of multimedia in diversifying multimedia facilities among teachers but also involving students to make the Internet a source of reference (Suryadi, 2007). From the perspective of students, internet usage and websites like the use of MOOC can encourage students to take advantage of learning using MOOC.

According to Ibrahim (2015), students should have shown high interest in classes using the website because it is easy to get information directly. Furthermore, students can ask questions and provide answers at any time and they can complete the training and assignments according to their own ability and suitability (MdYusof, 2014). Additionally, the increased interest in the students peaked when the information contained in the website from various levels of course and general allows students to be free to choose the appropriate information according to their level of understanding and ability (Arsyad, 2008). Karsidi (2013) stated that multimedia technology like MOOC has paved the way for new education. For example, drilling strategies where some attempts have to be made by the students. Learning using MOOC can provide immediate feedback to students. This will indirectly give a very positive reinforcement to the students' interest.

The results of the analysis obtained from questions 1 to 8 have answered the question of this study. In this regard, the researchers can conclude and argue that the student's interest in using MOOC is at a high level. Researchers argue that most items of student interest questions on MOOC use among catering students have shown that students are aware of the MOOC application facility in the learning process. This is in line with Bell's (2010) statement, through the multimedia software that is the use of MOOC, students are also more likely to understand and work to improve their mastery of the concepts they are teaching.

The findings show that catering students' styles in MOOC use are at high levels for the whole item. This can be seen when some students agree that they visit the MOOC's website to find information materials. Motivation in determining the learning style of learning is the overall ability to move someone who helps the learning method to ensure the learning technique so that the purpose of the individual or subject of learning can be achieved (Williams & Williams, 2011). Schunk, Meece, & Pintrich (2013), described that learning styles are very complex that can refer to the term acceptance of someone who characterizes

the existence of feelings and reactions. This can be seen when some students agree that the MOOC helps them learn not to spend time. This statement is supported by Vaibhav & Gupta (2014), where MOOC users can access without any time and place gaps. In addition, the findings show that stu-dents use the MOOC platform on daily basis. This statement is reinforced by (Tessier, Sarra-zin, & Ntoumanis (2010) through multimedia learning software that has the graphic, anima-tion, audio and video elements that can provide motivation for learning, as well as providing more effective and complete explanations.

The findings of the next study show individual and group learning preferences driven by MOOC's use. The findings also show MOOC's application to help students choose the content of the lesson creatively as well as the desire to seek higher knowledge. According to Yahya (2013), students are increasingly likely to find the information needed through electronic-based facilities arising from the widespread dissemination of information. Multimedia technology has vast potential to improve the quality and efficiency of the learning process with critical and creative (Insyasiska, Zubaidah, & Susilo, 2015). In conclusion, student learning styles in MOOC use are high but need to be improved to ensure MOOC implementation among catering students. Results of the analysis obtained from questions 1 through 8 have answered the question of this study.

## CONCLUSION

The findings provide information to researchers on the importance of using MOOC in the teaching and learning process, especially for catering program at Muar Vocational College. Besides, the MOOC literacy, student interest and learning style towards MOOC usage can enhance by using effective methods which can ensure the maximum level of learning of the students in addition to ensuring that the knowledge delivered by the teacher can be received effectively. Therefore, by using this MOOC platform can help students in improving performance and achievement in learning.

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# MUSICAL INTERPRETATION: CASE STUDY IN MUSICAL INSTRUMENT PRACTICE LEARNING VOCATIONAL HIGH SCHOOL

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Abstract

*This study was intended to reveal: (1) the dimensions of musical interpretation taught; (2) the strategy used by teachers to introduce musical interpretation in instrument practice class; and (3) teacher's ability or competence to teach musical interpretation. This research is case study, with the subjects were 12 teachers responsible for instrument practice class. They were selected using purposive sampling method. The data collection method used were in-depth interviews, passive participation observation, documentation and focus group discussion (FGD). The instrument of study was the researcher herself. Data validity was conduct triangulation by reviewing data acquired from a source. All data then were analyzed using interactive model which included data reduction, data presentation, and conclusion/verification. The results show that: (1) the dimensions of musical interpretation taught in every instrument practice class, were only dimensions of knowledge; (2) the strategy used by teachers when teaching musical interpretation was a direct strategy, teacher-centered learning approach, and used individual approach; and (3) teachers' competence in teaching musical interpretation must be improved, both pedagogical and professional competences.*

**Keywords:** *musical interpretation, teaching, teacher competence*

## INTRODUCTION

Vocational education is a type of mid-level education which aims to prepare students before applying for work. Vocational education system provides knowledge and skills that are needed in order to ease their experience in the workplace. It is related to the way the teacher teach or embed values in certain work areas.

As we know it, vocational education in Indonesia has two targets preparing students before entering the workplace and advancing them to higher education (Andini, 2007),. Meanwhile, the concept of vocational education today tends to promote life skills education paradigm (Abadi, 2011, p. 1). Life skills are needed because vocational education is expected to provide proper skills for the graduates before facing the outside world and be able to solve problems encountered in real life. Therefore, students in vocational school need to be equipped with knowledge, skills, and life skills that can be used and useful in their workplace, as well as musical expertise.

Musical skill is one of 12 vocational disciplines which has been established within the framework of international curriculum (Rauner, 2009, p. 1447), and also one of the skill competences in vocational education skills spectrum (SK Ditjen Mandikdasmen No. 251/C/kep/mn/2008). In the field of musical skills, students need to be equipped with the knowledge of musical theories and musical instruments performance skills, including interpreting a piece of music, either artistic or non-artistic piece of music, before entering the workplace, especially as a player.

SMK Negeri 2 Kasihan Bantul Yogyakarta (formerly known as Music High School) is the only vocational high school which a music program and remains consistent with the basic skill areas of Western art music. This school is one of the most desired vocational school by junior high graduates. This is evident from the increasing number of students accepted each year at the school within the past three years.

As the only vocational school that provides musical programme with Western art influences such as Baroque, Renaissance, Classical, and Romantic, the school administration must prepare its students so that they are well-prepared for future workforce competition. Many musical and life skills are taught in the school so that their graduates may compete and dominate the existing labour market.

Most of the time, graduates of SMK Negeri 2 Kasihan Bantul were accepted in many sectors. It is proved tha until 2018, a total of 75% of the Twilite Orchestra musicians are alumni of SMK Negeri 2 Kasihan Bantul (Ghozali, 2018). Prevoiusly, in 2010/2011, 24 alumni of this school became part of Indonesian Police Headquarters Musical Corps in Jakarta, while in 2012 about 22 alumni were accepted to the Indonesian Air Force based in Adisutjipto Airport, Yogyakarta.

Furthermore, the alumni of SMK Negeri 2 Kasihan Bantul who work as a teacher in music institutions, such as Purwa Caraka Music School, are numbered around 27 people and spread across various cities in Indonesia. This indicates that the school graduates are much absorbed as both a solo musician or group, and also as a teacher in music class institutions with various kinds of musical instruments that they mastered.

In vocational schools that has a music program like SMK Negeri 2 Kasihan Bantul, the learning process, especially on the subjects of major instrument practice, ideally the ratio between teachers and students is 1:1. This means that the learning process required a face-to-face ratio of 1 teacher to 1 student (private). With such an ideal condition, it is expected that the teacher can give a thorough teaching and a concrete example in applying the techniques of playing a musical instrument which includes attitudes, skills, and interpretation when performing a musical work in harmony with the characteristics of the musical work being played.

When playing a piece of music, especially works of Western art music, students need to be aware that many elements are contained in the music, so students must analyze each element in the music in order to know what the comoser's intention is. After analyzing it, the student is required to communicate any of these elements to the audience. The only way to communicate it is to use a method that is interpretation. Interpretation itself is an understanding or translation of the symbols and elements of music contained in a score.

Furthermore, in order to interpret a piece of music, students should also learn every element of music featured in the score, because we need to realize that in music itself there are

many elements of music (Duckworth, 2010, p. xxii) in addition to the fundamental elements it has. If students can interpret or understand a piece of music properly, they are also expected to communicate the work to the audience properly. This is because the interpretation is also associated with communication. Therefore, students also need to know and understand the structure and analysis of musical form.

According to Hermeren (2001, p. 13), the purposes of interpretation in music, among others, are to know what the composer wishes, to express and communicate feelings, and to describe the historical, social, and psychological conditions for the creation of works that are about to be interpreted. Interpreting a piece of music, especially the artistic music, is necessary in order to provide clarity to every tone that has been created by the composer, and clarity is produced in a musical performance. Therefore, musical interpretation is closely related to the musical performance.

A musician can be said to be a professional in the field of music if he has good skills (in terms of musical instrument playing techniques), and has the capability of understanding musical interpretation and be able to apply it when performing a piece of music. The statement was confirmed by Sloboda's opinion in Reid (2002, p. 104) which said, "a performer Might be a superb technician but lack of musical insight, and vice versa. An expert musician will be Able to balance technical finesse with interpretive understanding." Thus, to be an expert musician is not enough by having the skills to play instruments/singing alone, but also a good insight about music, so that there is a balance between the skills of playing instruments/singing and interpretive understanding.

In SMK Negeri 2 Kasihan Bantul, one of the objectives to be achieved in the process of learning is that the students can master the instrument practice well. They are expected to perform well, either solo or in groups. However, to realize the capabilities that are about to be achieved is not easy. This is because there are still barriers that need to be addressed, such as the students' lack of the ability to interpret a piece of music especially when performing it.

On the implementation of the instrument practice learning process, teachers tend to teach matters related to instrument playing techniques/singing techniques, while musical interpretation is not taught explicitly. This resulted in students who don't understand with musical interpretation learning. When playing a piece of music, especially works of western art music, students only play what is written in the score. This means that every element of music, including music history in and about the repertoire, is not well understood. In reality, the art of interpretation is not only to play what is written on the score track, but also make a possibility for students to create the elements contained in the score musically while informing it, and make it artistic.

Casals (Kitelinger, 2010, p. 1) stated that, "Without interpretation, it is just poor pen-and paper music". That is, if a music performer didn't user interpretation while performing a piece of music, the song will be felt as monotonous or "bland". To that end, a music performer needs to have knowledge of music, musical ability, sensitivity to music, and a good musical quality, in order to interpret a musical work properly. This is necessary because musical interpretation (Silverman, 2007, p. 101) is more than an aural photocopy of the score, and an act that brings the entire ability of a person which includes intellectual, social, cultural, artistic, physical, emotional, and personal into musical performance events. Another opinion related to musical interpretation is expressed by Kitelinger (2010, p. 2) which is the process of discovering the meaning implied in the written symbols. As in linguistics, a music interpreter (teacher) exchanges these symbols in an agreed system of meaning (consensus), and it is paving the way for music to become a medium of communication.

From the opinions that have been described, it can be said that the musical interpretation is to recreate what has been written by the composer from a music presenter so that the music has an understood meaning and becomes an artistic sound. Therefore, musical interpretation should be taught in instrument practice learning. This is because musical interpretation is the understanding of a whole piece of music.

Based on the problems described above, the objectives of this study were (1) to reveal the dimensions of musical interpretation taught by teachers; (2) to know the strategies used by teachers in teaching musical interpretation in instrument practice learning; (3) to show the teachers' competence when teaching musical interpretation instrument practice learning.

## Research Method

This study uses case study qualitative approach. We use case study because we need to learn more about the individuals (teacher) in order to help them adapting well (Gerring, 2007, p. 12). This study is also an empirical study which explores phenomena (Yin, 2009, p. 18) about musical interpretation learning that must be taught in instrument practice which includes knowledge, perception, and musical experience.

When conducting this case study, the researcher investigate and probe into a particular phenomenon (case) regarding how a teacher teach musical interpretation, and then the interpretation dimensions (knowledge perception, and experience) which are being taught by instrument practice teacher to 10$^{th}$, 11$^{th}$, and 12$^{th}$ grade students of SMK Negeri 2 Kasihan Bantul Yogyakarta can be determined.

The study was conducted from August to December 2012. The data was collected at SMK Negeri 2 Kasihan Bantul, Yogyakarta. This is it is the only vocational school with a musical expertise area which consistently teaching western music learning, so it is interesting to study how instrument practice teachers teach musical interpretation which includes knowledge, perceptions, and experiences.

Teachers who administer instrument practice subjects are amounted to 12 people and determined purposively by adjusting it to the research objectives. Teachers become the subjects of this study because teachers play a major role in every educational system, including music education. Teachers will teach and impart knowledge about music to their students, including teaching musical interpretation. By teaching musical interpretation, students are expected to understand and know it so that they can apply it when performing western art music.

This case study was conducted in three phases, namely pre-field, in the field, and post-field. At the stage of pre-field, the researcher created a study permission for preliminary study as well as research, prepared interview manual, recording devices such as cameras, camcorders, and notebooks.

In the field, the researcher carried out further assessment of the place of study (SMK Negeri 2 Kasihan Bantul) for data collection. Because qualitative research methods put more emphasis on process rather than outcome, to meet the accurate results, the researcher see the whole process so this study puts the researcher as the main instrument in extracting and processing of the obtained data.

In the post-field phase, the researcher carried out a series of process of data analyses and interpretation of data that has been obtained previously. All data that has been analyzed is written in the form of a report.

Most of the data in this study are presented in form of words and sentences. Others are in form of pictures which were obtained via photography and video taping. On her case study, Yin (2009, p. 83) said that there are six sources which can be used to collect evidence and data for research purposes: documentation, records archive, interviews, field observation, participatory observation, and physical artefacts.

Pertaining to this study, data that were collected as evidence were obtained through the use of four different data collection techniques, namely (1) in-depth interviews; (2) observation; (3) documentation; and (4) a focused group discussion (FGD). Interviews were conducted face-to-face (Gillham, 2000, p. 62) to provide flexibility in communicating with the research subject, in this case the teachers who teach instrument practice: Drs. Gmr I (Clarinet and Saxophone); Brn Ari, S. Sn. (Trumpet); Drs. Stn, M. Pd. (Oboe); Sprj, M. Sn. (Guitar); Fd, M.A. (Violin); Brg Brt W, EP. (Cello); Fr gf. S. Pd. (Violin); Drs. Sdrt (Cons Bas); Utr, S. Sn. (Piano); Drs. Lg SMJ (vocals); and Dra. Yhn L.S. (Vocal). Interviews were conducted after the class was dismissed and resting time. The questions asked are not separated from the interview manual that has been prepared. However, it is possible that those questions are spontaneous but still inside the fringe of the studied issues.

Passive participant observation is an observation made directly to an object that is studied in a natural setting. In other words, researchers observe directly the ability of teachers, teachers' strategies, as well as the teachers' competence in teaching musical interpretation in instrument practice learning. While on observation, the researcher conducted a simple observation that consists of three elements (Gillham, 2000, p. 45), namely (1) to see what the teacher taught related to musical interpretation following instrument practice

learning process which has been implemented by teachers according to a predetermined schedule; (2) to listen to what the teacher says; and (3) at any time, to ask the teachers to explain the questions that are asked. Data acquisitions by observation were noted and recorded in form of videos and photos.

Documentation is used to get data that are needed. Documents used in thi study are presented in form of written report and illustrations (Sugiyono, 2012, p. 82). Written documents provided here are instrument practice syllabi, while the illustrated ones are comprised of photos and videos which were taken during teaching process in school. Figure 1, 2, and 3 serve as the examples of instrument practice learning.

Figure 1. A Teacher Teaches a 9th Grade Student How To Play Cello (*Collection: Ayu,2012*)

Figure 2. A Teacher is Pay Attention Student of Grade 12 in Playing Scales (*Collection: Ayu, 2012*)

Data that have been obtained through interviews, observation, and further documentation is verified through focused group discussion. FGD itself is a data collection activities by means of group discussion to discuss issues that have been determined, and is done in a systematic and purposeful way. FGD in this study was held on January 21, 2013 and attended by 4 teachers of instrument practice as research subjects, and is facilitated by one moderator and assisted by two people who helped record the course of the FGD. The discussion material in this FGD is related to instrument practice learning, especially musical interpretation learning.

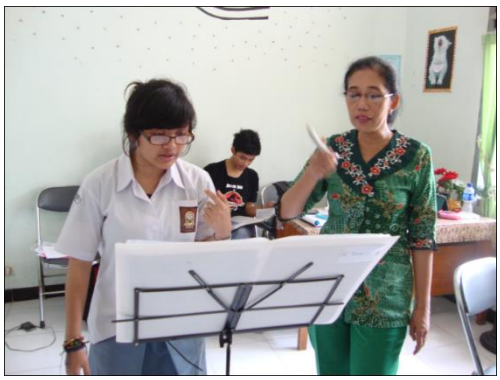

Figure 3. A teacher is Teaching Singing Techniques to a Student. (*Collection: Ayu, 2012*)

The data analysis consists of three stages: pre-field, in the field, and post-field. Pre-field data analysis is to analyze the results of preliminary studies, which are used to determine the focus of research. The results of preliminary studies indicate that when playing a piece of music, a student reading directly the scores of the song, while the teacher only directs how to read notation correctly. It seems that teachers only transfer knowledge to students. Whereas in playing a piece of music, especially artistic musical works, reading notation correctly is not enough, the interpretation of the score itself is also required. This is the focus of research.

In field analysis is performed interactively (Miles & Huberman, 1994; Sugiyono, 2006) and carried out continuously until the data collection was complete. At the time of interview and observation, analyses of the answers and the observed phenomena are also conducted.

The components analyzing interactive model data (Miles & Huberman, 1994, p. 10) used in this study consisted of 1) data reduc-

tion, 2) data presentation, and 3) conclusion / verification. Data reduction is done by summarizing, taking basic and important data, and make categorization. The steps of data reduction (Lacey & Luff, 2001; Patilima, 2011) were conducted in this study: transcription, data organization, recognition, and coding. After data reduction is done, the next step is to present the data. In this study, the data is presented in the form of narrative text. In addition, the data are also presented in tabular form.

In this study, data that related to strategies used by teachers, and teachers' competence in teaching musical interpretation are presented narratively, while data that related to the dimensions of musical interpretation are presented in tabular and narrative form.

The final step of this interactive model data analysis is conclusion. The study finds the weakness of teachers in the teaching musical interpretation. Their weakness is how less-detailed the information given in class related to musical interpretation. Teachers teach playing musical instrument/singing techniques more than other techniques. Based on findings obtained in this study, an alternative strategy about western musical interpretation learning may be applied, which is comprised of five M's. They are learning (mempelajari), seeing (melihat), hearing (mendengarkan), comparing (membandingkan), and discussing and reflecting (mendiskusikan dan merefleksikan).

## Results and Explanation

In instrument practice learning, musical interpretation is one of important aspects that need to be taught to students along with instrument practice technics. In learning process, students are not only equipped with the skills to play any instrument, but also equipped with the knowledge, and the ability to interpret a piece of music being played.

Developing interpretations of the music being played, according to Ford (2011, p. 2) is one of the most important and enjoyable aspects of music making. This is because interpretation can reflect the ideas and feelings of the player about the music which is being played. Thus, through interpretation, a player can communicate his emotional connection with the music being played. However, Ford (2011) also said that unfortunately many musicians and music teachers are generally more concentrated to notes and rhythm which are part of the framework of interpretation. This also happens instrument practice learning at SMK Negeri 2 Kasihan Bantul, especially in musical interpretation learning. In the learning process, the teacher concentrates more on notes, rhythm, music instrument performance techniques. This is proved by interviews described in another section. The dimensions of musical interpretation which are taught are limited to how to read notes and rhythm correctly. This activity is shown in Figure 4.

Figure 4. A Teacher Teaches How to Read Notes Correctly in a 12th Grade Classroom. (*Collection: Ayu, 2012*)

In Figure 4, we can see that the teacher still guides his students to read notes on a musical sheet. This is done because the 12th grade students are experiencing problems in reading notes. The same condition is also described on an interview with Sprj:

> *Anak-anak itu masih sulit bacanya...jadi masih perlu dituntun. Kalau engga ya..mereka mandeg ga praktik. Ga cuma baca not yang masih masalah, tapi juga baca ritmenya juga masalah. (Students have difficulties when reading notes, so they must be guided. If they are not guided, they would stuck and won't practice. Not only reading notes, they also can't read rhythms properly.) (Ptn).*

Instrument practice learning such as in a guitar class goes on until the end of class. Sometimes, the teacher gives an example of musical performance that is being taught, then the students imitate what the teacher did. This activity is illustrated in Figure 5.

Figure 5. A Teacher Shows a 12th Grade Student How to Play Music. (*Collection: Ayu, 2012*)

In violin class, both A and B (A is administered by Fr Gf, while B is by Fd), and cello class, the teachers are more focused to the playing techniques. This is in line with an interview with Fr Gf:

> *Dalam praktik instrumen itu yang penting adalah teknik permainan. Nek teknike wis dikuasai, sing liane gampang. (If the playing techniques are finally mastered, they can easily master other techniques). (Ptn).*

The same thing is also said by Fd and Brg Brt W who added that playing techniques is one of the most important things to be taught in instrument practice.

> *Dalam praktik instrumen, teknik-teknik permainan menjadi pokok penting yang diajarkan, karena kalau siswa tekniknya bagus, maka dia bisa juga meng-interpretasikan karya musik yang dimainkan. (In instrument practice, the performance techniques are the important aspects that are taught, because if students know the techniques, they may interpret a song that they play.) (Ptn) (interview with Fd.).*

> *Nek ngajari praktek sik penting ya teknik, etude dan lagu noo..Nek iso teknik, siswa-siswa iso main dewe ora tergantung karo gurune. (When teaching practices, the most important things are techniques, etude, and song. If students know the techniques, they can play a song without assistance from their teacher). (Ptn) (interview with Brg Brt W).*

Based on those interviews, we can conclude that technique is the main thing that must be taught in instrument practice. According to Fd, if students mastered the technique, they can interpret the piece of music being played. In order to interpret a musical work, playing technique is not enough, a performer needs to have the knowledge and skill labout musical interpretation itself. The learning process on playing techniques is illustrated in Figures 6 and 7.

Figure 6. A Teacher Performs Bowing Technique with 12th Grade Students. (*Collection: Ayu, 2012*)

Figure 7. A Teacher Performs Fingering Technique with a 12th Grade Student. (*Collection: Ayu, 2012*)

On Figure 6 in violin class A, we can see that the learning process is pretty classical, while in violin class B (Figure 7), the learning process is individual. Nevertheless, individual approach is also added in violin class A, especially when the teacher assessed every single student's technique. Like both violin classes, the same process also occurred in other class as told by Yhn L.S (vocal class A teacher):

> *Kelas X lebih ditekankan ke teknik, ya... pernafasan, intonasi, pengucapan, karena mereka kan baru pertaman kali belajar vokal ini. Selain itu, mereka juga harus*

*banyak latihan membaca partitur. (Class X is directed towards techniques… breathing flow, intonation, pronunciation, because they are first-timers in the vocal class. They also need to read more musical scores.) (Ptn).*

From those classes, it can be explained that in the instrument practice learning process, teachers tend to emphasize things related to basic techniques of playing instruments and singing (breathing).

Meanwhile, one of interpretation frameworks that need to be taught is frasering (White, 2009), taught in saxophone and piano classes. In both classes, the students are well-motivated to train themselves. When attending practice learning process, students can perform a song with ease without any guidance whatsoever. However, the teacher guides the students to play melodies in one phrase, known as frasering. An interview with the saxophone teacher (Gmr I) proves the statement above:

*Siswa-siswa kelas XI ini jauh lebih termotivasi dalam praktik daripada siswa-siswa kelas XII. Mereka sangat mandiri, sehingga saya tidak perlu lagi menuntun mereka membaca notasi. Saya tinggal mengajarkan frasering dan sedikit-sedikit saya ajarkan juga bagaimana menganalisis lagu. (The 11th grade students are more motivated for practice rather than the 12th grade ones. The 11th grade students are more independent. I don't even need to guide them reading notes. I can just teach them frasering and slowly teaching how to analyze songs.) (Ptn).*

The same thing also said by piano teacher (Utr) as told in an interview:

*Mereka saya ajari bagaimana memainkan frasering, karena mereka sudah tidak masalah dalam membaca. Jadi perlu ditingkatkan lagi teknik-teknik per-mainannya,salah satunya bagaimana memainkan melodi dalam satu frase. (I taught them how to play frasering because they have no problems in reading. They need to improve their playing techniques, including how to play melodies in a phrase.) (Ptn).*

The learning process of frasering in saxophone and piano practices class is illustrated in Figures 8 and 9.

Figure 8. A Teacher Gives an Example on How to Play a Melody in One Phrase to 10th Grade Students. (*Collection: Ayu, 2012*)

Figure 9. A Teacher Shows the 12th Grade Students the Melodies that are Played in One Phrase. (*Collection: Ayu, 2012*)

Based on Figures 8 and 9, the teacher taught frasering to students that are already fluent when reading musical notes. Frasering I taught because if students could play melody in one phrase, they may interpret a song independently.

Regarding the learning strategy used by teachers to teach musical interpretation, every intrument practice teacher used various methods like imitation method, demonstration method, and drill method. Preaching method is used to explain things related to performance techniques. Imitation method is used to give an example to the students, and then they follow what the teacher did. Demonstration method is used to show an example of instrument performance performed by the teacher, while the drill method is used to help students playing some parts of the song that are considered difficult. With the application of drill method, students would not find any difficulties when performing a song in the future.

The use of these methods in practice is collaborated with one another and adapted to a variety of factors such as the development of the student's skill level, objectives, contents of learning materials, and the environment. If only one method is used by the teacher in musical interpretation learning, it may not necessarily be able to achieve the learning objectives that have been determined. Therefore, the teacher uses a variety of methods in every learning process. The use of such methods can be described through an interview with vocal teacher B (Lg SMJ):

> *Biasanya, saya kasih contoh dulu..satu dua kali. Setelah itu siswa mencoba menyanyikan lagu seperti apa yang sudah saya contohkan. Sambil praktik, yo aku jelasi juga tentang teknik-teknik vokal, supaya mereka ngerti. (Sometimes I give one or two examples first, then the students try to sing the song like I did before. While practicing, I also explain the vocal techniques to them.) (Mtd)*

The teacher's posture when giving an example using demonstration and imitation methods can be seen in Figure 10.

Figure 10. Vocal Teacher B Gives an Example of Correct Articulation Technique to 12th Grade Students. (*Collection: Ayu, 2012*)

Based on Figure 10 and the interview with vocal teacher B (Lg SMJ), teachers use demonstration method (shows how to sing with a good and correct articulation technique) which is combined with lecture method (explaining the techniques of articulation). Teachers also use the imitation method, because teachers also give examples of singing with good and correct articulation technique. Students then try to practice singing by imitating what has been exemplified by the teacher. The use of these methods in musical interpretation learning in vocal class B is intended to motivate students to practice and continue developing their own ability and improving their singing skills.

Based on observation, we know that almost all instrument practice teachers, who are the subjects of this study, have a good personality. When teaching instrument practice, particularly musical interpretation, teachers are in a relaxed situation, including when guiding students to read musical sheets. The following interview with an 11th grade student from saxophone class confirmed the statement above:

> *Pak Gmr I ngajarnya asik, santai. Ga cuma ngajarnya tapi orangnya juga asik, baik lagi. (Mr. Gmr I is a fun and relaxed person. Both his teaching and personality are admirable.) (Prsp).*

Other opinions about a nice teacher also appeared on an interview with one of the 12th grade students (Nnc) in vocal class B:

> *Saya senang diajar pak Lg Smj. Dia baik, sabar kalo ngajarin kita. Terus pak Lg Smj orangnya rajin. (I like being taught by Mr. Lg Smj. He's a kind person, and well-tempered in class. He is also a diligent person.) (Prsp).*

From those three metaphors, we can say that the teachers show an admirable personal while teaching instrument practice so that students can follow the learning process easily. Nevertheless, the teachers' nice personality is often used by students who are not prepared to practice to avoid attendance in class. In some cases, learning process have to be cancelled. This phenomenon was revealed on an interview with vocal teacher A (Yhn L.S):

> *Nek bocah-bocah ra siap praktek…yo wis…ora ono pelajaran. (If students are not prepared to practice, well, there will be no class that day.). (Kmpt)*

The same condition happened on a piano class managed by Utr. In this class, if students are not ready enough to practice, there will be no learning process. That account is based on the following interview:

> *Kadang-kadang anak-anak tidak siap untuk praktik. Kalau anak-anak pada tidak siap praktik, saya tidak mengajar.*

*(Sometimes students weren't prepared for practice. If they're not prepared, I can't teach them.) (Kmpt).*

From what we got by the interview, it seems that although teachers have a good personality, it doesn't mean that assertiveness in class comes along with it. It is proved by seeing that there are many students who were not ready for instrument practice learning process and teachers seem not doing anything about it. Situations like this can be used by teachers to motivate their students and discuss the subject that are being taught that day.

## CONCLUSION

Based on the results, the conclusion of this study is as follows:

First, in every musical instrument practice class, musical interpretation learning is not wholly taught by their teachers. It means that teachers teach musical interpretation only on its knowledge dimension, including what lies on a musical sheet. Dimensions of knowledge that are being taught include frasering, reading notes and rhythm, dynamics, tone color, and intonation, while perception dimension and real-world musical experience actually can improve and develop musical interpretation skills that were not taught nor discussed in instrument practice learning process. Most teachers tend to teach the technics of instrument performance or singing.

Second, music teachers' strategy on applying musical interpretation learning using direct learning method is a teacher-centered learning strategy with individual approach. Furthermore, teachers used imitation method in their learning process. This situation happens in every instrument practice class that are included as subjects of this study.

Third, teachers competence when teaching musical interpretation must be improved, both from their pedagogical and professional competences. From pedagogical competence standpoint, we can see that teachers only supervise students who perform music, their students were less-motivated, and teachers didn't teach musical interpretation in detail. Thus the students cannot develop many of their academic abilities. Teachers also didn't facilitate students to work out their non-academic abilities. Meanwhile, from professional competence standpoint, especially knowledge, some teachers didn't understand well the dimensions of interpretation that must be taught as well as the strategy used in musical interpretation learning.

### Suggestions

Because musical interpretation is tightly related with musical performance, when teaching about any form of musical performance, teachers should teach their students to hear their own musical performance over and over again, especially when students are involved in the learning process. Based on the aforementioned suggestion, an alternative strategy about western musical interpretation learning may be applied, which is comprised of five M's. They are learning (mempelajari), seeing (melihat), hearing (mendengarkan), comparing (membandingkan), and discussing and reflecting (mendiskusikan dan merefleksikan). The flow of musical interpretation learning using 5 M strategy is illustrated on Figure 11.


Figure 11. . The 5 M strategy that can be used by teachers in musical interpretation learning

Students must be more active in learning instrument practice and not dependent upon teachers in the learning process. It means that students must develop their own musical potentials, be more discipline when they indulge themselves in an independent and structured training, and keep thinking about playing western musical arts. Thus, not only they have skills to perform music, they also have an ability to interpret it well. It can be said that students are well-equipped to play musical instruments.

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# ENTREPRENEURIAL CHARACTER EDUCATION THROUGH THE SCHOOL CULTURE IN THE VOCATIONAL HIGH SCHOOLS

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Abstract

*The study was to describe the implementation of the entrepreneurial character education through the school culture in the vocational high schools (VHSs).The method that the researcher made use in the study was the qualitative one.* The study *was conducted in the 2 Depok Public Vocational High School and the 2 Pengasih Public Vocational High School. The data source in the study was the school members, the documents, and the school cultures. The data was collected by means of observation, interview, and documentation. For the instruments, the researcher made use of the human instrument and the interview guideline. The data was analyzed by using the* open coding, the axial coding and the selective coding. *The findings in the research were as folows: the entrepreneurial character education by means of the school culture implementation in the VHSs had been included in the entrepreneurship culture* through: *(1 ) the five artifacts in the verbal/conceptual dimension that might generate* 17 dominant entrepreneurial characters*; (2) the five artifacts in the action/behavioral dimension that might generate 8* dominant entrepreneurial characters*; and (3) the four artifacts in the physical/material dimension that might generate* seven dominant entrepreneurial characters.

**Keywords:** *entrepreneurial character education, school culture, VHS*

## INTRODUCTION

Vocational high school (VHS) as one of the institutions that generates the labors needs to pay attention to the competitive edge of the graduates in terms of comparative advantage, competitive advantage and cooperation capability. The comparative advantage refers to the the ability in producing goods/service with more cost-efficient manner. Then, the competitive advantage refers to the ability of the vocational high school graduates in pursuing the bargaining power. In order to achieve these advantages, the vocational high schools should empower their graduates in order that they will be able to compete in pursuing their employment or in opening their own employment. Through their capability in both pursuing and opening the employment, the vocational high school graduates are expected to be able to decrease the rate of unemployment in Indonesia which has still been high.

From the direction of national development on the national education in 2010-2014, the vision and the mission of the Directory of Vocational High School Education state that vocational high school graduates are demanded to be employment-independent and be business-independent. From the direction, it has been apparent that the focus of VHS development lies in the entrepreneurial development in order to produce VHS graduates who have entrepreneurial spirit and characteristics. Akbar (2009) argues that based on the results of a study conducted in the Harvard University one might conclude that the success of a person is not merely determined by the knowledge and the technical capability (the hard skill) that tend to develop the intelligence quotient (IQ); instead, the success of a person is determined more by the ability to manage himself or herself and the other people that has been found in the emotional quotient (EQ) and the spiritual quotient (SQ). The results of the study found that 20% of the success might only be determined by the hard skills and the remaining 80% of the success might be determined by the soft skills. The results of the study has been in accor-dance with the opinion of Goleman (2006, p. 44) that states that 80% of the success rate for a person in the community will be influenced by the emotional quotient and the rest 20% of the success rate will be influenced by the intelligence quotient.

The results of the study indicates that the entrepreneurial development in the VHS should be conducted comprehensively not only in the hard skills but also in the soft skills. The development of entrepreneurial soft skills will mostly be related to the development of entrepreneurial characters and cultures. Juridicially, the development has been in accordance with the Presidential Instruction Number 4 Year 1995 regarding the National Movement of Habituating and Culturalizing Entrepreneurship (Presiden Republik Indonesia, 1995). Through the national movement it has been expected that the entrepreneurial cultures will be the part of working ethics in the society, including the VHS members, in order to generate the reliable, tough and independent new entrepreneurs. Referring to the Presidential Instruction Number 4, the President of the Republic of Indonesia in his speech delivered in the 2010 National Summit has stated the importance of encouraging the entrepreneurial spirit and the educational metholodogy that develop the entrepreneurship more (Usman, 2010, p. 8). The entrepreneurial spirit is heavily related to the entrepreneurial characters. Thereby, in order to generate the VHS graduates that have entrepreneurial spirit the educational process will be heavily related to the entrepreneurial character education.

Philosophically, the concept of character education, including the entrepreneurial character education, has been manifested by Ki Hadjar Dewantara. In his educational concept, he argues that education is an effort to develop the manners (the power of internal-self and characters), the mind (the intellectual aspect) and the physic of the children. The components of the children's manner, mind and physic should not be separated in order to promote the children's life perfection. Thereby, it might be inferred that according to Ki Hadjar Dewantara character education has been a very important integral part in the education (Samani & Hariyanto, 2011, p. 33).

Entrepreneurial characters are the characters of an entrepreneur that will be implemented in the entrepreneurial process. According to Dharma (2009, p. 14), the entrepreneurial characters are divided into three dimensions namely: moral knowing, moral feeling and moral action. Therefore, the entrepreneurial character education is an education that has been related to the fundamental values that de-

velop one's personality in the entrepreneurial process and the education consists of moral knowing, moral feeling and moral action.

The implementation of the structural strategy has long ruled the reasoning pattern, the development of the working system and the improvement as having been done by the Department of National Education by rearranging multiple existing components, multiple regulations and curricular reorientations, multiple training programs and alike. According to the Department of National Education (Depdiknas, 2003, p. 1), based on a long experience such structural strategy is not effective especially when the strategy encounters long-term needs that demand the improvement on the school quality. It has been explained further that based on multiple experiences and results of studies in the business world many experts have found that the school culture has been the best predictor in viewing the differences in the learning quality. Therefore, in order to implement the entrepreneurial education in all of educational degrees, including in VHS, the school culture should be the first priority.

The school culture might be used for pursuing the effective character education. Berkowitz (Elkind & Sweet, 2004) explains that effective character education is not adding a program or set of programs to a school. Rather it is a transformation of the culture and life of the school. In other words, the implementation of character education, including the entrepreneurial character education in the VHS, will be more effective if the education is implemented by means of transformation in the school cultures and the school life rather than in the curriculum change by adding the learning materials of character education into the curriculum content. The learning effectiveness in the VHS by means of school culture is philosophically supported by one of the Prosser theories which states that vocational education will be effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in the occupation itself (Prosser & Quigley, 1950, p. 220). Therefore, the habituation by means of school culture is believed to generate the effective vocational learning, including the development of entrepreneurial characters. The problem in such situation is: How is the implementation of entrepreneurial character education by means of school culture in the VHS?

In relation to the explanation, the objective of the study in general is to find the theory that has been related to the entrepreneurial character education by means of school culture in the VHS.

Then, the theoretical benefit of the study is to that the results of the study might support the theory of entrepreneurial education in the VHS especially that has heavily been related to the entrepreneurial characters by means of school culture benefit as the learning media. In addition, the practical benefit of the study is that the results of the study might be made as a matter of enrichment in the implementation of entrepreneurial education within the VHS.

According to Berkowitz & Bier (2005), Nuh (2010), Ramly et al. (2010) Ramly (2010) and Samani & Hariyanto (2011), entrepreneurial character education is an education that has been related to the fundamental values that establish one's personality within the entrepreneurial process. The entrepreneurial process consists of moral knowing, moral feeling and moral action that has been formed both by the hereditary influence and the environmental influence; then, the entrepreneurial process will be used as the foundation in the learning participants' paradigm, perspective, attitude and action as an entrepreneur.

Stolp & Smith (1995), Schein (2004) and Rosseau (Sobirin, 2009) define the school culture as a conceptual design that contains the standards for taking decisions based on the fundamental assumptions and that will be used as the appropriate way of viewing, thinking and feeling in solving the problems that occur in the schools. Furthermore, they explain that the school culture is divided into three levels namely: (1) artefacts; (2) values and beliefs; and (3) basic assumptions. The artifacts serve as the outer layer of the school culture. Then, the values and beliefs serve as the middle layer of the school culture. Next, the basic assumptions serve as the inner layer of the school culture.

The artifacts in the school culture include all of the visible, heard and felt phenomena in the schools (Schein, 2004, p. 25). The construction of this level is formed through the physical and social environment. Sobirin (2009, p. 169) explains that artifacts have been the entry to understand the school culture for the external people and have been the form of cultural communication among the internal and

the external people in the school. The artifacts have also been invisible element and have been easily observed by a person or a group of persons both from inside and outside the organization (visible and observable). Therefore, if the external people would like to understand the school culture then first of all the external people should understand the artifacts. Stolp & Smith (1995, p. 36) propose that the level of school culture in the artifacts has been the easiest layer to be observed. The artifacts are the closest layer of school culture to the school atmosphere where people provide their perspective toward the schools. Thereby, the researcher would like to conclude that the artifacts of the school culture include all of the visible, heard and felt phenomena in the schools. The artifacts have been the very first aspect that will be observed in understanding the school culture.

In this layer, the artifacts, all people might view: (a) architecture of physical environment; (b) language; (c) technology and product; (d) creation; (e) dressing style; (f) behavior; (g) apparent emotion; (h) myth and organizational story; (i) published value; (j) apparent routine activity; (k) ceremony; (l) organizational flowchart; (m) formal description about how an organization works as having been written in the vision and the mission and alike (Schein, 2004, p. 25). In this case, the artifacts of physical buildings, including the physical buildings, might reflect the organizational cultures.

From the theory proposed by Hatch (1993), Stolp & Smith (1995), Anonim, (2003), Schein (2004) and Sobirin (2009), the researcher might locate in details that in the artifacts there are three inter-related dimensions namely: (a) verbal/concep-tual dimension; (b) behavioral dimension; and (c) physical/material dimension. The elements that might be grouped into the verbal/concep-tual dimension are as follows: (a) schools' vision and mission; (b) curriculum; (c) schools' organizational structure; (d) schools' figures and achievement history; and (e) languages spoken in the schools. Then, the elements that might be grouped in the behavioral dimension are as follows: (a) teaching-learning activities; (b) routine habits/actvities; (c) rules, awards and punishments; (d) psychological and social supports; and (e) interactions with parents and community. Next, the elements that might be grouped into the physical/material dimension are as follows: (a) tools and facilities; (b) building form and layout; (c) motto and ornament; and (d) dressing/uniform manner.

## METHODS

The study regarding the entrepreneurial character education by means of school culture in the VHS was conducted by means of qualitative method by selecting the school members of 2 Depok Public Vocational High School and 2 Pengasih Public Vocational High School as the samples. In accordance with the focus of the study and the selected approach, the data gathering instruments and techniques that the researcher were observation, interview and documentation.

The data gathering techniques that the researcher would make use of were as follows: observation, interview and documentation. Then, the instruments that the researcher would make use of in the study were the human instrument and the interview guideline. The data, then, would be analyzed by means of open coding, axial coding and selective coding.

## RESULTS AND DISCUSSIONS

In order to educate the graduates to possess the competencies as an entrepreneur, both schools had implemented the entrepreneurial education through the teaching-learning activities both inside and outside the classrooms. The process of entrepreneurial education was heavily influenced by the school cultures, especially the ones in the entrepreneurship. Through the school cultures in the entrepreneurship, it had been expected that the vocational high school students would have the entrepreneurial characters both in order to meet the employment demand and to keep the pace with the higher education in accordance with the vocation.

In the study, the school cultures that had been referred to in order to implement the entrepreneurial character education in the VHS were the ones from the artifacts (consisting of three dimensions namely: verbal/conceptual dimension, behavioral dimension and physical/material dimension) and the ones from values and beliefs. The three dimensions in the artifacts contained the values and the beliefs regarding the entrepreneurship, which finally

would be crystalized in the deepest layer of school culture namely the basic assumptions.

The entrepreneurial character education by means of artifacts in the verbal/conceptual dimension would be performed in the following domain: (a) the schools' vision and mission that contained the entrepreneurial elements; (b) the schools' curriculum that was related to the entrepreneurship; (c) the schools' organizational structure that influenced the development of the school cultures; (d) the schools' history and figures that had attained the success in the entrepreneurship; and (e) the language that had been used on daily basis in the entrepreneurship.

The entrepreneurial character education by means of artifacts layer in the behavioral dimension would be performed in the following domain: (a) teaching-learning activities both that had been directly and indirectly related to the entrepreneurship; (b) routine activities/habits in the entrepreneurship that had been followed by the school members; (c) rules, awards and punishments that had been related to the school cultures in the entrepreneurship; (d) psychological and social supports toward the school members in the entrepreneurship; and (e) interaction with the parents and the community in the activities that had been related to the entrepreneurship.

On the other hand, the entrepreneurial character education by means of artifacts layer in the physical/material dimension would be performed in the following domain: (a) tools and facilities in the schools that would be used for the entrepreneurial activities; (b) forms and layouts of school buildings, especially the ones that would be used for the entrepreneurial activities; (c) mottos and decorations in the schools that were related to the entrepreneurship; and (d) school members' dresscodes/ uniforms, especially the ones that would be used in the entrepreneurship-related activities.

The results of this study had been in accordance with the theory of Hatch (1993), Stolp & Smith (1995), Anonim (2003), Schein (2004), and Sobirin (2009), which explained that the school cultures consisted of three layers. The outer layer of the school cultures was the artifacts that consisted of three dimensions, namely: verbal/conceptual dimension, behavioral dimension and physical/material dimension. Then, the middle layer of the school cultures was the values and beliefs. The values in the school cultures constituted a guideline that had been believed as right and wrong. On the other hand, the beliefs in the school cultures constituted the attitudes in terms of how the school members should work in their schools. Next, the inner layer of the school cultures was the basic assumptions that contained indebatable directions and that should be obeyed by the school members; the basic assumptions included the directions in sensing and in thinking about every matter in the schools. In this research, the focus toward the school cultures in the entrepreneurship, which would be used for implementing the entrepreneurial character education.

The activities of integrating the entrepreneurial character education into the school cultures within the study were performed in the artifacts layer of the entrepreneurship that covered: (a) the verbal/conceptual dimension which were related to the entrepreneurial characters; (b) the behavioral dimension which were related to the entrepreneurial characters; and (c) the physical/material characters which were related to the entrepeneurial characters. The selection of the artifacts layer as the entrepreneurial character education medium was in accordance with the theory of Stolp & Smith (1995, p. 36), which proposed that the school cultures in the artifacts layer has been the easiest aspect to observe.

The implementation of entrepreneurial character education-school cultures that was performed by integrating the entrepreneurial character education into the school cultures in the visible layer (the artifactas layer) finally would also influence the invisible layers (the values and beliefs and the basic assumptions). The implementation had been in accordance with the theory of Kotter & Hesket (1997, p. 5), which explained that the changes on the artifacts layer would cause the changes in the deeper layers namely the values and beliefs and the basic assumptions. The theory had been in accordance as well with the condition in the 2 Depok Public Vocational High School and 2 Pengasih Public Vocational High School because the artifacts in both vocational high schools contained the entrepreneurial characters. On the other hand, the entrepreneurial characters were in the school cultures within the value and beliefs layer.

The interaction among the three layers of school cultures in the entrepreneurship

within the study was a reciprocal one. According to Sobirin (2009, p. 154) the artifacts would generate the values and the beliefs in the school cultures; meanwhile, the existing values and beliefs would finally form the basic assumptions. Thereby, eventually the basic assumptions would be manifested into the values and the beliefs and would, therefore, be manifested as well in the artifacts of the school cultures.

From the study, the researcher found that all elements of the school cultures within the artifacts layer, in the verbal/conceptual dimension, the behavioral dimension and the physical/material dimension, contained the aspects that had been related to the entrepreneurial character education. However, the rate of association among the elements was not similar. There were some of the elements in the artifacts layer that might be heavily related to the entrepreneurial characters and, on the contrary, there were other elements that had less association to the entrepreneurial characters.

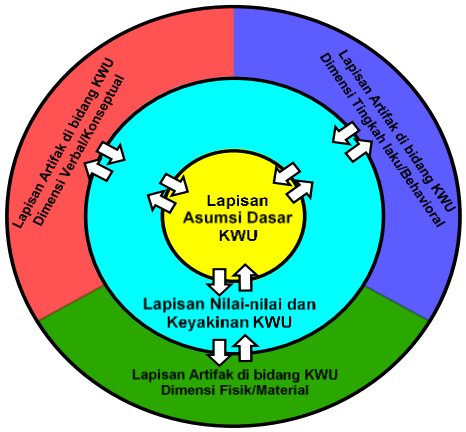


Figure 1. Integration of Entrepreneurial Character Education in the Entrepreneurial Character Education-School Cultures in the VHS

In relation to the role of Entrepreneurial Character Education-School Cultures in improving the school quality, the Entrepreneurial Character Education-School Cultures would be able to generate the VHS graduates that had entrepreneurial characteristics. The role had been in accordance with the theory of Stolp (1994), which proposed that from the results of a study a researcher might gather evidence that concluded that the school cultures had strong correlation to the improvement of achievement and motivation in the students' learning results. In addition, the results of this study had also been in accordance with the theory of Stolp (1994), which stated that the school cultures in the entrepeneurship would influence the five aspects as follows: (1) the academic challenges in the entrepreneurship; (2) the academic achievements in the entrepreneurship; (3) the introduction or the understanding toward the students' achievements in the entrepreneurship; (4) the school community in the entrepreneurship; and (5) the students' perception toward the schools' objectives in the entrepreneurship. In addition, Stolp (1994) also concluded that the students would be more motivated in their learning if they had strong support from the school cultures.

The superiority of the educationals system that had been implemented by means of school cultures were a valid variable for measuring the school quality. However, the achievements of entrepreneurial character education that had been pursued through the school cultures were not as fast as those of the structural manner. Gunningham & Gresso (Depdiknas, 2003, p. 5) implied that from the results of observation toward the structural improvement of school culture the schools had not been able to change the situations permanently. In the business domain, similar situation also occured as having been proposed by Kotter (Depdiknas, 2003, p. 5); he stated that success had been temporary in the short term if the changes would be pursued by means of restructurization. The changes of the school cultures would generate more permanent results in the long term. Thereby, it would be common if the school cultures would provide guidelines in assessing what would be important, what would be good, what would be right and how to achieve these aspects (Depdiknas, 2003, p. 5).

The results of this study has also been in accordance with the conclusions from the FGD activities. The factors that influenced the school cultures in the entrepreneurship were divided into three categories namely: influence from the figures, influence from the cultures and influence from the structures. The influence from the figures toward the school cultures consisted of the influence that had been exposed by: the school founders, the school owners, the principal management styles, the government figures and the community figures nearby the school. Then, the

influence from the cultures toward the school cultures consisted of: (1) school characteristics; (2) existing school cultures; (3) school members' best practice; (4) school members' communication effectiveness; (5) students' family cultures; and (6) community cultures around the school. Next, the influence from the structures toward the school cultures covered: (1) the school's vision and mission; (2) the school's organizational structure; (3) the school's regulation; (4) the laws; and (5) the government policy.

In the study, it had been apparent that the school members also expected the support of the principals'roles toward the Entrepreneurial Character Education-School Cultures as having been implied in the theory of Want (2007, p. 160). He explained that the roles of schools' principals in developing the school cultures in the entrepreneurship were as follows. First, the principal should be a student of culture in which every school member should learn the school cultures including the ones in the entrepreneurship. Second, the principal should perform renewal process. Here, the principals should establish the school cultures as a renewal process. Third, the principals should perform communication. The principals should maintain communication among the school members in order to share ideas and resources. Fourth, the principals should perform inclusiveness. The principals should involve all of the school members in developing the school cultures within the entrepreneurship. Fifth, the principals should build trust. The principals should build trust among the school members, which emphasized that they were still safe in delivering their ideas. Sixth, the principals should perform accountability. The principals should be responsible toward the process of developing the school cultures in the entrepreneurship.

There were 18 entrepeneurial characters that the researcher found in the study and these characters were similar to the ones in the theoretical foundations; these characters were divided into three aspects namely: moral knowing, moral feeling and moral action. The entrepreneurial characters that belonged to the moral knowing were as follows: (a) creative; (b) innovative; (c) being able to perform future vision; and (d) being able to realistic decision taking. Then, the entrepreneurial characters that belonged to the moral feeling were as follows: (a) encouraged to take risk; (b) honest; (c) responsible; (d) never giving up; (e) having strong motivation to succeed; (f) curious; (g) committed; and (h) independent. Next, the entrepreneurial characters that belonged to the moral action were as follows: (a) hardworking; (b) having orientation toward action; (c) communicative; (d) cooperative; (e) showing leadership; and (f) disciplined.

From the results of data analysis, the entrepreneurial characters contained in the process of entrepreneurial characters education by means of school cultures (Entrepreneurial Character Education-School Cultures) on the artifacts layer within all dimensions (verbal/ conceptual dimension, behavioral dimension and physical/material dimension), the researcher had found the ranking for the entrepreneurial characters. If the researcher would like to differentiate the dominant and the indominant entrepreneurial characters within the Entrepreneurial Character Education-School Cultures, the researcher found the dominant characters in the Entrepreneurial Character Education-School Cultures as having been displayed in Table 1. The researcher would consider that the entrepreneurial characters would be dominant if the percentage were above 50%.

Table 1. The Entrepreneurial Characters that were Dominant in the Entrepreneurial Character Education-School Cultures in the Verbal/Conceptual Dimension, the Behavioral Dimension and the Physical/Material Dimension

| No | Dominant Entrepreneur Character | Percentage | Aspect |
|---|---|---|---|
| 1 | Creative | 79.34 | Moral knowing |
| 2 | Realistic decision taking | 61.90 | Moral knowing |
| 3 | Innovative | 52.95 | Moral knowing |
| 4 | Responsible | 74.32 | Moral feeling |
| 5 | Honest | 63.71 | Moral feeling |
| 6 | Cooperative | 87.27 | Moral Action |
| 7 | Hardworking | 72.28 | Moral Action |
| 8 | Communicative | 67.64 | Moral Action |
| 9 | Disciplined | 65.59 | Moral Action |

From Table 1, it had been apparent as well that the dominant entrepreneurial characters (> 50%) in the school members' activities

of 2 Depok Public Vocational High School and 2 Pengasuh Public Vocational High School on the aspect of moral knowing were as follows: creative, being able to perform realistic decision taking and innovative. Then, the dominant entrepreneurial characters in the school members' activities in the 2 Depok Public Vocational High School and 2 Pengasih Public Vocational High School on the moral feeling were honest and responsible. Then, the dominant entrepreneurial characters in the school members' activities in the 2 Depok Public Vocational High School and 2 Pengasuh Public Vocational High School on the moral action were as follows: cooperative, hardworking, communication and disciplined.

The above entrepreneurial characters were attained by analyzing the activities of the school cultures in the artifacts layer that covered all dimensions namely: the verbal/conceptual dimension, the behavioral dimension and the physical/material dimension. If the analysis would be performed to each dimension in the artifacts layer, definitely the researcher, then, would have different results. On the other hand, if the entrepreneurial characters in the process of entrepreneurial character education by means of school cultures (Entrepreneurial Character Education-School Cultures) would be analyzed based on the artifact layers in the verbal/conceptual dimension only (without any consideration toward the beha-vioral dimension and the physical/material dimension), then the researcher would find the ranking for 17 dominant entrepreneurial characters as having been displayed in Table 2.

If the entrepreneurial characters in the process of entrepreneurial character education by means of school cultures (Entrepreneurial Character Education-School Cultures) would be analyzed based on the artifacts layer in the behavioral dimension only (without any consideration toward the verbal/conceptual dimension and the physical/material dimension), then the researcher would find the ranking toward the 8 dominant entrepreneurial characters as having been displayed in Table 3.

Furthermore, if the entrepreneurial characters in the process of entrepreneurial character education by means of school cultures (Entrepreneurial Character Education-School Cultures) would be analyzed based on the physical/material dimension only (without any consideration toward the verbal/conceptual dimension and the behavioral dimension), then the researcher would find the ranking toward the 7 dominant entrepreneurial characters as having been displayed in Table 4.

Table 2. The Entrepreneurial Characters that were Dominant in the Entrepreneurial Character Education-School Cultures within the Verbal/Conceptual Dimension

| No | Dominant Entreprenur Character | Percen-tage | Aspect |
|---|---|---|---|
| 1 | Creative | 92.86 | Moral knowing |
| 2 | Vision toward the future | 85.71 | Moral knowing |
| 3 | Innovative | 78.57 | Moral knowing |
| 4 | Realistic decision taking | 78.57 | Moral knowing |
| 5 | Independent | 92.86 | Moral feeling |
| 6 | Honest | 78.57 | Moral feeling |
| 7 | Responsible | 78.57 | Moral feeling |
| 8 | Committed | 78.57 | Moral feeling |
| 9 | Encouraged risk-taking | 64.29 | Moral feeling |
| 10 | Never giving up | 64.29 | Moral feeling |
| 11 | Curious | 64.29 | Moral feeling |
| 12 | Communicative | 92.86 | Moral action |
| 13 | Cooperative | 92.86 | Moral action |
| 14 | Hardworking | 78.57 | Moral action |
| 15 | Performing leadership | 78.57 | Moral action |
| 16 | Disciplined | 78.57 | Moral action |
| 17 | Action-oriented | 64.29 | Moral action |

Table 3. The Entrepreneurial Characters that were Dominant in the Entrepreneurial Character Education-School Cultures within the Behavioral Dimension

| No | Dominant Entrepreneur Character | Percen-tage | Aspek |
|---|---|---|---|
| 1 | Creative | 78.63 | Moral knowing |
| 2 | Realistic decision taking | 58.96 | Moral knowing |
| 3 | Responsible | 76.00 | Moral knowing |
| 4 | Honest | 65.04 | Moral knowing |
| 5 | Cooperative | 88.78 | Moral action |
| 6 | Hardworking | 70.86 | Moral action |
| 7 | Communicative | 65.04 | Moral action |
| 8 | Disciplined | 59.90 | Moral action |

Table 4. The Entrepreneurial Characters that were Dominant in the Entrepreneurial Character Education-School Cultures within the Physical/Material Dimension

| No | Dominant Entrepreneurial Character | Percentage | Aspect |
|---|---|---|---|
| 1 | Creative | 62.50 | Moral knowing |
| 2 | Innovative | 62.50 | Moral knowing |
| 3 | Realistic decision taking | 62.50 | Moral knowing |
| 4 | Action-oriented | 100.00 | Moral action |
| 5 | Disciplined | 100.00 | Moral action |
| 6 | Hardworking | 75.00 | Moral action |
| 7 | Cooperative | 62.50 | Moral action |

From these tables, the researcher would like to conclude that the school cultures in the entrepreneurship within the 2 Depok Public Vocational High School and the 2 Pengasih Public Vocational High School in the verbal/ conceptual dimension that contained many matters with regards to the school concept/ planning covered: (a) the school's vision and mission; (b) the curriculum; (c) the school's organizational structure; (d) the figure and the history of success in the school; and (e) the language that would be used in the school; all of these aspects had contained many entrepreneurial characters. From the 18 entrepreneurial characters that had been found in the study, the researcher found that the verbal/conceptual dimension had contained 17 entrepreneurial characters which percentage had been over than 50% in the number of activities (the result excluded the strong motivation toward the achievements). Although the school cultures in the entrepreneurship within the verbal/conceptual dimension that were heavily related to the school planning had contained many multiple entrepeneurial characters, the school cultures in the entrepeneurship in the artifacts layer within the behavioral dimension that were related to the school members'activities had contained few entrepreneurial characteristics.

From the 18 entrepreneurial characters that the researcher found in the study, the behavioral dimension contained only 8 dominant entrepreneurial characters namely: (a) creative; (b) realistica decision taking; (c) responsible; (d) honest; (e) hardworking; (f) cooperative; (g) communicative; and (h) disciplined. Thereby, although the planning of entrepreneurial character education had contained the entrepreneurial elements, the implementation of the entrepreneurial character education on the daily basis (which included: (a) teaching-learning activities; (b) routine habits/activities; (c) rules, rewards and punishments; (d) psychological and social supports; and (e) interactions with parents and society) had not contained much of these characteristics. Based on the data presented above, it had been apparent that the implementation of entrepreneurial character education on the daily basis had not used much of the entrepreneurial characters and, as a result, the entrepreneurial school cultures lied in the artifacts layer on the physical/material dimension, which had been heavily related to the school facilities, had not been used much for the entrepreneurial activities.

Furthermore, from the 18 entrepreneurial characters found in the study the physical/material dimension contained only 7 dominant entrepreneurial characters namely: (a) creative; (b) innovative; (c) realistical decision taking; (d) action-oriented; (e) disciplined; (f) hardworking; and (g) cooperative. Thereby, the researcher might infer that the entrepreneurial school cultures lied in the artifacts layer on the physical/material dimension that had been heavily related to the facilities were as follows: (a) tools and facilities; (b); forms and layouts of buildings; (c) mottos and decorations; (d) dresscodes/uniforms; unfortunately, these characters had not been harnessed optimally in order to support the entrepreneurial character education by means of school cultures.

The improvement of entrepreneurial characters by means of school cultures lied in the artifacts layer on the behavioral dimension and the physical/material dimensions might be pursued by implementing the theory of Sathe (1985, p. 17), which emphasized the process of school members' communication. According to Sathe, the process of school cultures formation came from the basic assumptions that had been shared by the school members in multiple forms namely: (a) shared feeling; (b) shared doing; (c) shared saying; and (e) shared things. Thereby, the concept of school planning contained in the entrepreneurial school cultures within the artifacts layer on the verbal/conceptual dimension should be shared more among the school members by means of shared feeling, shared doing, shared saying and shared

things. Through the communication, the matters that were related to the entrepreneurial characters would perfectly form the basic assumptions in the entrepreneurship.

The study supported the theory of Ciputra (2008, p. 53) that explained that based on his life experience the 3L path (*lahir* (born), *lingkungan* (environment) and *latihan* (practice) might be used for shaping an entrepreneur. In the study the researcher also found many efforts done by the VHS in pursuing the formation of entrepreneurship by means of *Lingkungan* (Environment) and *Latihan* (Practice). However, the *Lahir* (Born) aspect was not covered in the study. Ciputra (2008, p. 53) also explained if someone had gone through the 3-L path, then he or she would be a successful entrepreneur. On the contrary, the someone had not gone through the 3-L path then he or she would be quite difficult in pursuing the dream of being a successful entrepreneur. A successful entrepreneur might not rely on a series of unpredictable coinci-dence. Thereby, the vocational high school graduates that would have been more prepared for entrepreneurial efforts were the ones that had been trained by the VHS through the environment that contained the entrepreneurial characters and that came from the entrepreneurial families.

The results of the study also supported the theory of Ciputra (2008, p. 85) which explained that the concept of entrepreneurship education that had been in accordance with the implementation for the VHS. The same entrepreneurship education was similarly implemented in the Ciputra University and the core of the education was that the entrepreneurship had been a concept wider than the mere concept of business. Ciputra also stated that his concept was a social entrepreneurship that emphasized on: (1) formation of paradigm; (2) attitude; and (3) certain life skills which eventually generated the capability of creating opportunities, innovations and calculated risk-taking.

The Entrepreneurial Character Education-School Cultures found in the study had been in line with the concept of entrepreneurial education implementation in the VHS provided by the Center of Curriculum, Institutin of Research and Development, the Ministry of National Education. The concept of entrepreneurial education for the VHS provided by the Center of Curriculum would be implemented by: (a) manifesting the entrepreneurial education into all subjects, teaching materials, extracurricular activities and even self-development; (b) developing the educational curriculum that provided the concents of entrepreneurial education for raising the awareness toward the entrepreneurship and for growing the entrepreneurial characters and/or skills; and (c) developing the entrepreneurial cultures within the school environment by means of school cultures that should be supported by the local contents (Usman, 2010, p. 6).

## CONCLUSIONS

Based on the results of the study toward the entrepreneurial character education by means of school cultures (the Entrepreneurial Character Education-School Cultures) in the 2 Depok Public Vocational High School and 2 Pengasih Public Vocational High School, the researcher would like to draw the following conclusions.

First, the entrepreneurial character education in the 2 Depok Public Vocational High School and the 2 Pengasih Public Vocational High School was implemented by means of school cultures and the implementation of the entrepreneurial character education consisted of three dimensions namely: (a) verbal/conceptual dimension; (b) behavioral dimension; and (c) physical/material dimension. Then, the Entrepreneurial Character Education-School Cultures in the verbal/conceptual dimension was performed through: (a) the schools' vision and mission in the entrepreneurship; (b) the 2009 Curriculum and the 2013 Curriculum; (c) the schools' organizational structure; (d) the history and the figures of entrepreneurial success in the schools; and (e) the language spoken in the schools.

Second, the Entrepreneurial Character Education-School Cultures in the behavioral dimension was implemented by means of: (a) entrepreneurial teaching-learning activities; (b) routine entrepreneurial habits/activities; (c) entrepreneurial rules, awards and punishments; (d) psychological and social supports toward the entrepreneurial activities; and (e) interactions with the parents and the society in the entrepeneurship.

Third, the Entrepreneurial Character Education-School Cultures in the physical/material dimension was implemented by means

of: (a) entrepreneurial tools and facilities; (b) forms and layouts of buildings that were used for the entrepreneurial activities; (c) entrepreneurial mottos and decorations; and (d) practical uniforms in the schools.

Fourth, there were 18 entrepreneurial characters of the Entrepreneurial Character Education-School Cultures in the study. Then, there were 17 dominant entrepreneurial characters within the Entrepreneurial Character Education-School Cultures namely: (a) creative; (b) vision to the future; (c) innovative; (d) realistical decision-taking; (e) independent; (f) honest; (g) responsible; (h) committed; (i) encouraged risk-taking; (j) never giving up; (k) curious; (l) communicative; (m) cooperative; (n) hardworking; (o) showing leadership; (p) disciplined; and (q) action oriented.

The suggestions that may be provided for this research are as follow:

First, the Directory of Vocational High School Coaching should support the efforts of pursuing the entrepreneurial character education by means of school cultures. The steps that should be taken are performing socialization and publishing the manual of entrepreneurial character education in th vocational high schools in order to accompany the development of entrepreneurial educaton that had been done by the Center of Curriculum and Book Publishing, the Ministry of National Education.

Second, the principals should actively socialize and evaluate the entrepreneurial character education by means of school culture toward all of the school members, especially in the artifacts layer on the behavioral dimension. The socialization and the evaluation should be accompanied by the benefits of human resources as having been implied in the entrepreneurial cultures lied in the artifacts layer on the physical/material dimension.

Third, all of the teachers should be active facilitators and evaluators toward the activities of entrepreneurial character education by means of school cultures by using the role modelling, the learning, the empowering, the habituating, the strengthening and the evaluating strategies.

Fourth, the school employees should totally support the efforts of entrepreneurial character education by means of school culture with their role as the teachers' partners in each of the entrepreneurial education activities by means of school cultures.

Fifth, the students should be ready as the executors of entrepreneurial character education by means of school cultures under the teachers' guidance.

Sixth, the business/the industrial domain (*Dunia Usaha/Dunia Industri* or also known as *DUDI*) should optimize the partnership with the VHS through the industrial working practice, the entrepreneurial education and training, the student company coaching, the teaching factory development, the unit of job implementation and alike.

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