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ASOSIASI DOSEN & GURU VOKASI INDONESIA
IN COOPERATION WITH
GRADUATE SCHOOL OF
UNIVERSITAS NEGERI YOGYAKARTA

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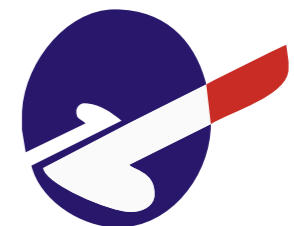
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THE EFFECT OF ARIAS LEARNING MODEL ON THE LEARNING OUTCOMES ABOUT CONTINENTAL FOOD PROCESSING IN BOGOR 3 STATE VOCATIONAL SCHOOLS FROM CREATIVITY OF STUDENTS

Supari Muslim
Postgraduate Program, State University of Surabaya

Nisa Rahmaniyah Utami
Postgraduate Program, State University of Surabaya

Rita Ismawati
Postgraduate Program, State University of Surabaya

Erina Rahmadyanti
Postgraduate Program, State University of Surabaya

Nita Kusumawati
Chemistry Department, Surabaya State University, Surabaya

Ridwan Che Rus
Technical and Vocational Faculties, Universiti Pendidikan Sultan Idris (UPSI) Malaysia

Abstract
This study aims to obtain information about: (1) differences in learning outcomes between students who study using the ARIAS learning model and students who learn using direct learning (DL); (2) differences in learning outcomes between students who have high creativity and students who have low creativity; and (3) whether the relationship between the use of learning models and learning outcomes in continental food processing is influenced by students' creativity. This experimental study was conducted using a 2 x 2 factorial design, with the moderator variable being students' creativity. In the experiment, the separation of the level of student creativity was not carried out significantly. Students are called to have high creativity, if they have a score higher or equal to the median group (ian median), while students are called to have low creativity, if they have a score less than or below the median (<median) group. The study was conducted in class XI Hospitality 1 by applying the ARIAS learning model, and class XI Hospitality 2 by applying DL. The study found that: (1) students who studied using the ARIAS learning model obtained significantly higher cognitive, affective and psychomotor learning outcomes than students who studied using DL; (2) students who have high creativity, obtain significantly higher cognitive, affective and psychomotor learning outcomes than students who have low creativity; and (3) the relationship between the use of learning models and learning outcomes in continental food processing is influenced by student creativity.
Keywords: *ARIAS learning model, creativity, learning outcomes*

Contact Supari Muslim ✉ supari.muslim@gmail.com
🖳 Postgraduate Program, State University of Surabaya, Jl. Ketintang No.30, Ketintang, Gayungan, Kota Surabaya, Jawa Timur 60231

INTRODUCTION

Schools as executors of formal education are responsible for learning activities, both intracurricular and extracurricular. The teacher as the implementing authority of learning in the class is obliged to create an active, innovative, creative, and enjoyable learning environment. To support the teaching and learning process, teachers need to apply certain learning models, so students can learn effectively, to achieve optimum learning outcomes. Based on the results of the survey conducted, during this time the learning process for the subjects of processing and serving continental food at SMK Negeri 3 Bogor, was presented conventionally, so that student activities in learning were not optimal, which resulted in their low learning outcomes. To overcome these problems, an appropriate learning model is needed, so that students can learn intensively, so that their learning outcomes reach the expected optimum point. Thus the question arises: what learning model is appropriate for teaching subjects in processing and serving continental food? Is the learning model Assurance, Relevance, Interest, Assessment, Satisfaction (ARIAS) or direct learning model?. ARIAS learning model is a learning model that provides more learning opportunities for students, through various activities, both in class and outside the classroom (real world). The intensity of such learning activities will provide more experience and learning outcomes to students.

Based on several reasons as outlined above, it is very necessary to conduct research on: "The influence of ARIAS learning models and creativity on the learning outcomes of students of SMK Negeri 3 Bogor on subjects of processing and serving continental food".

Based on the background of the research described above, the formulation of the problem in this study are as follows: (1) whether there are differences in learning outcomes between students who learn using the ARIAS learning model and students who learn using direct learning models on processing subjects and serving continental food at SMK Negeri 3 Bogor ?; (2) are there differences in learning outcomes between students who have high creativity and students who have low creativity in the subjects of processing and serving continental food at SMK Negeri 3 Bogor?; and (3) is the relationship between the use of learning models and learning outcomes in continental food processing influenced by student creativity?

The main characteristics of the ARIAS learning model are: (1) learning models that spur students to have confidence and attitude of confidence to succeed in learning (Assurance); (2) learning must relate to the real life of students, whether in the form of present or future experience (Relevance); (3) success in learning because of an interest in things that need to be learned (Interest); (4) in learning there needs to be an evaluation process, both during the learning process takes place and at the end of learning (assessment); (5) students must study seriously, in order to achieve pride in the success of their learning (Satisfaction).

Based on the explanation above, it is expected that ARIAS learning can improve critical thinking skills and creativity for students. Creativity is a talent that is potentially owned by everyone (including students), which can be identified and developed through appropriate learning. Each student is required to become an expert in a particular field, so students' creativity needs to be developed in learning, and it is necessary to know about the influence of creativity on the learning outcomes of the students concerned. Creativity is a condition, attitude, ability, and process of changing one's behavior to produce products or ideas, looking for more efficient and unique problem-solving in the learning process.

Creativity gained through the process of creative thinking is a manifestation of higher-order thinking processes, therefore, the ability to think is the highest cognitive competence that needs to be mastered by students. According to Siswono (2008, p. 18), creative thinking is a mental activity that is used by someone to develop new ideas or ideas fluently and flexible, which according to Silver (1997, p. 76) the level of creativity can be measured using "The Torrance Test of Creative Thinking (TTCT).

According to Torrance (1965, p. 9), that creativity is: (1) as a process of feeling and facing a problem; (2) guess about the answer to a problem; (3) identify any difficulties in finding answers to a problem; (4) finding solutions and making guesses, or formulating hypotheses as answers to a problem; (5) assess and test the allegations or hypotheses; and (6) changing hypotheses and testing them again, so that they find answers or results. The definition of cre-

ativity explains as a natural process and human needs involved at each stage of problem-solving. In this regard, Silver (1997, p. 182) states that people who are creative in high-level thinking, seem to have a creative character and orientation towards their activities.

Whereas according to Marrapodi (2003, p. 28), creativity is often defined as an idea that is parallel to intelligence, but different from intelligence. Creativity is not limited to cognitive, intellectual, and behavioral functions, but creativity is related to a mixture of complex motivations, personality factors, environmental conditions, accidental factors, and the products produced. Furthermore, according to Sternberg (2006, p. 43), creativity is a meeting of six different components, but interrelated, including intellectual ability, knowledge, thinking style, personality, motivation, and environment.

The ability to think creatively as described above, is important for vocational students, especially in facing the 21st century, where they must have four competencies which include: (1) critical thinking; (2) creative and innovation; (3) collaborative; and (4) communicative. These four competencies will be obtained through active learning, through deductive and inductive approaches. Active learning, through deductive and inductive approaches, is learning that makes learning inherent, through actively searching and combining information from classrooms, workplaces, communities, then using it will embed that information in the memories of students. Such active learning is in line with recommendations from Unesco which include: (1) learning to know; (2) learning to do; (3) learning lo live together, and (4) learning to be.

The UNESCO recommendation, in line with the opinion of Hadlock et al. (2008, p. 1), that teaching does not merely convey what is written in the book, but students must practice soft skills in learning, learning and working in teams, and practicing interpersonal communication skills, so that students gain hands-on experience and practice work to enter the workforce.

To help vocational students develop intellectual potential as mentioned above, according to Johnson (2014, p. 182), Contextual Teaching and Learning (CTL) teaches steps that can be used in critical and creative thinking and provides opportunities to use these think-ing skills at a higher level in the real world environment, the real reason is that the food of the human brain is the real world. Therefore learning that emphasizes action, will give students the opportunity to experience the real world in countless ways (Johnson, 2014, p. 155).

Based on the explanation above, it can be seen that the ARIAS learning model is a learning model that gives more learning opportunities to students, through various activities, both in the classroom and outside the classroom (real world). The intensity of such learning activities will provide more experience and learning outcomes to students.

While in the direct learning model, what is done with syntax: (1) clarification of goals and motivating students; (2) presenting knowledge and demonstrating skills; (3) provide guided training; (4) checking understanding and feedback; and (5) provide advanced training and transfer. Based on the syntax, it can be seen that in the direct learning model, learning activities in the classroom are mostly carried out by the teacher, so that the learning time and opportunity for students is relatively lacking, which will affect the learning outcomes.

Thus it can be assumed: (1) there are differences in learning outcomes between students who learn by using the ARIAS learning model and students who learn using the direct learning model, on subjects of processing and serving continental food at SMK Negeri 3 Bogor; (2) there are differences in learning outcomes between students who have high creativity and students who have low creativity in the subjects of processing and serving continental food at SMK Negeri 3 Bogor.

Based on the study of theory and the results of relevant research hypotheses are proposed as follows: (1) there are differences in learning outcomes between students who learn using the ARIAS learning model and students who learn using direct learning models, on subjects of processing and serving continental; (2) there are differences in learning outcomes between students who have high creativity and students who have low creativity in the subjects of processing and serving continental food.

METHOD OF RESEARCH

The research design used in this study is a 2x2 factorial design with creativity moderator variables, as shown in Figure 1.

$$
\begin{array}{llll}
E & O_1 & X_1 & Y_1\ O_3 \\
& & & Y_2\ O_4 \\
\hline
K & O_2 & X_2 & Y_1\ O_5 \\
& & & Y_2\ O_6
\end{array}
$$
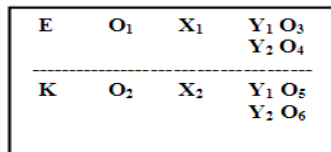
(Adaptation of Tuckman (1999)).

Figure 1.   Factorial Design of 2x2

Description:

E : experimental class taught by ARIAS learning model.

K : control class taught by direct learning model.

X1, X2 : treatment in the experimental/control class.

Y1 : high level of creativity in the experimental/control class.

Y2 : low level of creativity in the experimental/control class.

O1, O2 : pre-test in the experimental/control class.

O3, O4, O5, O6 : post-test in the experimental/control class.

Furthermore, the research analysis design was carried out as shown in Table 1.

Table 1.   Design of Research Analysis

Model of Teaching (B)	Level Creative of Thinking (A)	
	High Level of Creative Thinking (Y_1)	Low Level of Creative Thinking (Y_2)
ARIAS Learning Model (B_1)	Learning Outcomes $(B_1)\ (Y_1)$	Learning Outcomes $(B_1)\ (Y_2)$
Direct Learning Model (B_2)	Learning Outcomes $(B_2)\ (Y_1)$	Learning Outcomes $(B_2)\ (Y_2)$

Description:

$B_1\ Y_1$: Learning Outcomes of student that has a high level of creative thinking who learned by using ARIAS Learning Model

$B_1\ Y_2$: Learning Outcomes of student that has a low level of creative thinking who learned by using ARIAS Learning Model.

$B_2\ Y_1$: Learning Outcomes of student that has a high level of creative thinking who learned by using Direct Learning Model.

$B_2\ Y_2$: Learning Outcomes of student that has a low level of creative thinking who learned by using Direct Learning Model.

The study was conducted at SMK Negeri 3 Bogor in Class XI Catering, odd semester of the academic year 2016 - 2017, for subjects of processing and serving continental food. As the subject of the study, students of class XI Catering 1 and Catering 2. In conducting research, the separation of the level of creativity of students is pseudo, meaning that in the experimental activities, students are not significantly separated, between students who have high levels of creativity and students who have low creativity. Before the experiment is conducted, a test is held to determine the level of creativity of students. Students are called to have high creativity, if they have a score higher or equal to the median group (>median), while students are called to have low creativity, if they have a score less than or below the median (<median) group.

This study took the subject of two classes, namely: (1) class XI Catering 1 taught by using the ARIAS learning model; and (2) class XI Catering Services 2 which are taught using the direct learning model. The data analysis technique used is the 2-way ANOVA test, after the prerequisite test, the normality test and homogeneity test.

RESEARCH RESULTS AND DISCUSSION

Testing the first hypothesis: there are differences in learning outcomes (cognitive, affective and psychomotor domains) between students who learn using the ARIAS learning model and students who learn by using a direct learning model on subjects of processing and serving continental food at SMK jty.

In Table 2 it appears that F_{count} for cognitive learning outcomes on the influence of the learning model is 5,831 with a significance level of 0.019. Because the significance level is 0.019 <0.05, then H_0 is rejected and H_a is accepted.

Thus, it can be concluded that there is a significant difference in the use of ARIAS learning models and direct learning models on the cognitive learning outcomes of students in the subjects of processing and serving continental food.

Table 2.   Two-way ANOVA Test Results to Learning Outcomes of the Cognitive Domain on the influence of the ARIAS learning model

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2260.169[a]	3	753.390	13.719	.000
Intercept	386140.898	1	386140.898	7.032E3	.000
Class	320.208	1	320.208	5.831	.019
Creativity	1444.898	1	1444.898	26.312	.000
Class * Creativity	444.708	1	444.708	8.098	.006
Error	3294.831	60	54.914		
Total	396180.000	64			
Corrected Total	5555.000	63			

a. R Squared = .407 (Adjusted R Squared = .377)

Furthermore, as shown in Table 2, that F_{count} for affective domain learning outcomes for the influence of the learning model is 11.889 with a significance level of 0.001. Because the significance level is 0.001 <0.05, then H_0 is rejected and H_a is accepted. Thus it can be concluded that there is a significant influence on the use of ARIAS learning models and direct learning models on the affective learning outcomes of students in the subjects of processing and serving continental food.

Table 3.   Two-way ANOVA Test Results to Learning Outcomes of the Affective Domain on the influence of the ARIAS learning model

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	599.828[a]	3	199.943	23.901	.000
Intercept	409721.813	1	409721.813	4.898E4	.000
Class	99.453	1	99.453	11.889	.001
Creativity	337.813	1	337.813	40.382	.000
Class *Creativity	146.453	1	146.453	17.507	.000
Error	501.922	60	8.365		
Corrected Total	1101.750	63			

a. R Squared = .544 (Adjusted R Squared = .522)

In Table 3, it can be seen that the calculation for the psychomotor domain of learning outcomes on the influence of the learning model is 6.497 with a significance level of 0.013. Because the significance level is 0.013 <0.05, then H_o is rejected and H_a is accepted. Thus it can be concluded that there is a significant influence on the use of ARIAS learning models and direct learning models on psychomotor domain learning outcomes of students in the subjects of processing and serving continental food.

Table 4.   Two-way ANOVA Test Results to Learning Outcomes of the Psychomotor Domain on the influence of the ARIAS learning model

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	570.898[a]	3	190.299	19.820	.000
Intercept	406311.7	1	406311.750	4.232E	.000
Class	62.382	1	62.382	6.47	.013
Creativity	367.500	1	367.500	38.276	.000
Class *Creativity	129.0	1	129.007	13.436	.001
Error	576.086	60	9.601		
Total	410587.000	64			
Corrected Total	1146.984	63			

a. R Squared = .498 (Adjusted R Squared=.473)

Second Hypothesis Testing: there are differences in learning outcomes (cognitive, affective and psychomotor domains) between students who have high creativity and students who have low creativity in the subjects of processing and serving continental food at SMK Negeri 3 Bogor. Statistical tests were carried out using 2-way ANOVA as shown in Table 5, Table 6, and Table 7.

In Table 5, it can be seen that Fcount for cognitive learning outcomes in the influence of creativity is 26.312 with a significance level of 0.000, which means that H_0 is rejected and H_a is accepted. Thus it can be concluded, that there is a significant influence between high creativity and low creativity on cognitive learning outcomes in the subjects of processing and serving continental food. Furthermore, the ANOVA 2 path test results on affective learning outcomes for the influence of creativity as shown in Table 6.

In Table 6 it appears, that Fcount for affective domain learning outcomes for the influence of creativity is 40,382 with a significance level of 0,000, which means H_0 is rejected and H_a is accepted. Thus, it can be concluded, that there is a significant influence between the level of high creativity and a low level of creativity on the learning outcomes of the affective domain on the subjects of proc-

essing and serving continental food. Furthermore, in Table 7, it can be seen that Fcount for psychomotor domain learning outcomes on the influence of creativity is 38,276 with a significance level of 0.000, which means that H_o is rejected and H_a is accepted. It can be concluded, that there is a significant effect between the level of high creativity and low level of creativity, on the learning outcomes of the psychomotor domain, on the subjects of processing and serving continental food.

Table 5.   Two-way ANOVA Test Results to Learning Outcomes of the Cognitive Domain for the influence of the Creativity

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2260.169[a]	3	753.390	13.719	.000
Intercept	386140.898	1	386140.898	7.032E3	.000
Creativity	1444.898	1	1444.898	26.312	.000
Class	320.208	1	320.208	5.831	.019
Creativity * Class	444.708	1	444.708	8.098	.006
Error	3294.831	60	54.914		
Total	396180.000	64			
Corrected Total	5555.000	63			

a. R Squared = .407 (Adjusted R Squared = .377)

Table 6.   Two-way ANOVA Test Results to Learning Outcomes of the Affective Domain for the influence of the Creativity

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	599.828[a]	3	199.943	23.901	.000
Intercept	409721.813	1	409721.813	4.898E	.000
Creativity	337.813	1	337.813	40.382	.000
Class	99.453	1	99.453	11.889	.001
Creativity * Class	146.453	1	146.453	17.507	.000
Error	501.922	60	8.365		
Total	413908.000	64			
Corrected Total	1101.750	63			

a. R Squared = .544 (Adjusted R Squared = .522)

Table 7.   Two-way ANOVA Test Results to Learning Outcomes of the Psychomotor Domain for the influence of the Creativity

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	570.898[a]	3	190.299	19.820	.000
Intercept	406311.750	1	406311.750	4.232E4	.000
Creativity	367.500	1	367.500	38.276	.000
Class	62.382	1	62.382	6.497	.013
Creativity * Class	129.007	1	129.007	13.436	.001
Error	576.086	60	9.601		
Total	410587.000	64			
Corrected Total	1146.984	63			

a. R Squared = .498 (Adjusted R Squared = .473)

In this section, there will be a discussion about the results of the study associated with the theories and the results of relevant research about the effect of ARIAS learning models and creativity on learning outcomes in the subjects of processing and serving continental food. The intended learning outcomes consist of three domains: (1) cognitive domain learning outcomes; (2) affective learning outcomes; and (3) psychomotor domain learning outcomes.

Learning outcomes for students who use the ARIAS learning model are significantly higher than students who learn by using the direct learning model on the subjects of processing and serving continental food at SMK Negeri 3 Bogor

The results of this study are in line with the results of the research by Sopah (2001) who found that the ARIAS learning model improved learning outcomes, both affective learning outcomes, cognitive domains, and psychomotor domains. The findings of this study, similar to the findings of Ningsih (2010), that the ARIAS learning model positively influences the mastery of students' concepts, on biology

The results of this study are also in accordance with the theory which states that the ARIAS learning model is a learning model that seeks to instill confidence in students, seeks to attract and maintain student interest and attention, which ultimately fosters pride in students, thus providing reinforcement in the process learn. Based on these conditions, it is only natural that cognitive domain learning

outcomes for students taught using the ARIAS learning model are significantly higher compared to cognitive domain learning outcomes for students taught using the direct learning model.

Furthermore, the results of this study are in line with the main characteristics of the ARIAS learning model which include: (1) being able to spur students to have confidence and attitude of confidence to succeed in learning (Assurance); and (2) learning related to real life (Relevance).

The second main feature is in line with the principle of "Contextual teaching and learning (CTL)", that CTL (Johnson, 2014, p. 88) helps students to: (1) find meaning in lessons by connecting academic material to the context of living their daily lives; (2) making important relationships that produce meaning by carrying out self-regulated learning, working together, thinking critically and creatively, respecting others, to achieve high standards.

Learning through working with other students is in line with the concept of cooperative learning (Sharan, 2012, p. 262), which states that learning in cooperative groups provides an opportunity to see the thinking processes of group members so that they are able to shape their own minds.

By collaborating according to Johnson (2014, p. 73), students will be helped in terms of: (1) finding problems, designing plans, and finding solutions to problems; (2) sowing tolerance and feeling of love; and (3) knowing that listening to each other between students will lead to success. Johnson (2014, p. 75) further states that the principle of interdependence will lead to the creation of relationships among fellow students so that teachers will adopt the practice of CTL in helping students to make connections in order to find meaning in their learning.

Training in the industry includes bringing students towards learning that adheres to the principles of CTL. Therefore the results of this study support the results of the study of Ambiyar, Yulastri, Putri, & Wulansari (2018) which concluded that Industrial training can improve student knowledge, work skills, and English language skills, and enhance the role of supervisors and instructors/industrial supervisors and provide solutions for students to overcome the problems they face. Furthermore, this training program is needed to improve the

quality of tourism facilities and infrastructure into the hospitality industry and improve the attitude of students in conducting industrial training courses.

In line with that, Joyce & Weil (2011) stated that cooperative learning is far more effective in enhancing personal, social, and academic development for students. More than that, learning in groups will improve the ability to think critically and creatively, and will increase the ability to respect others, which is in line with the challenges of living in the 21st century era (Hidayat & Patras, 2015) which includes: (1) critical thinking; (2) creative and innovation; (3) collaborative; and (4) communicative. It is therefore reasonable, that Unesco recommends four pillars of education which include: (1) learning to know; (2) learning to do; (3) learning to live together; and (4) learning to be.

The results of this study are also in line to the principle of learning "teaching factory", as stated by Rentzos, Doukas, Mavrikios, Mourtzis, & Chryssolouris (2014), that the purpose of the teaching factory is to: (1) integrate learning in the school environment with the industrial environment, through training in the use of work tools, and various instruments in the industrial environment; (2) provide opportunities for students to practice in order to develop soft skills as a whole in the work environment in a real way; and (3) provide opportunities for students to practice technopreneur completely, starting from planning, production processes, and marketing, so that students gain the ability to think critically and creatively.

Therefore learning that emphasizes action, will give students the opportunity to experience the real world in countless ways (Johnson, 2014, p. 155). Educational practices supported by brain research according to Schunk (2012, p. 89) are: (1) problem-based learning; (2) simulation and role-playing; (3) active discussion; (4) visual appearance; and (5) a positive learning climate. Such a learning process in order to achieve a sense of pride in the success of learning (Satisfaction).

Furthermore, this study found that affective domain learning outcomes for students taught with ARIAS learning models were significantly higher than affective learning outcomes for students who were taught with direct learning models on the subject of processing and serving of continental food at SMK Negeri

3 Bogor. It turns out that the results of this study are in line with the findings of Praptinasari (2012), that the ARIAS learning model significantly influences the learning outcomes of biology subjects for students of class XI IPA Al Islam 1 Surakarta High School, both in the cognitive, affective and psychomotor domains. Likewise, the results of this study are also in line with the results of research by White & Smerdon (2008), who found that collaborative attitudes can be developed through group discussion activities in the ARIAS learning model.

According to Muslim (2013), that such group discussions require the attitude of cooperation, sharing tasks and responsibilities in completing tasks. Collaboration can eliminate mental barriers due to limited experience and narrow perspectives (Johnson, 2014, p. 164). This study found that psychomotor domain learning outcomes for students taught with ARIAS learning models were significantly higher than psychomotor realm learning outcomes for students taught with direct learning models on the subject of processing and serving of continental food at SMK Negeri 3 Bogor.

The results of this study are in line with the results of the Hindayani (2013) study, which found that the ARIAS learning model supports students to be more active in learning so that their psychomotor abilities are better. Related to Yasa's research findings (2014), the results of this study are also in line that ARIAS learning has proven to be better, compared to the application of direct learning models.

Learning outcomes of students who have high creativity are significantly higher than students who have low creativity, on subjects of processing and serving continental food at SMK Negeri 3 Bogor

Creativity is a condition, attitude, ability, and process of changing one's behavior to produce products or ideas, looking for more efficient and unique problem-solving in the learning process (Craft, 2004). This study found that cognitive, affective, and psychomotor domains of learning outcomes for students who have high creativity were significantly higher than the learning outcomes for students who had low creativity in the subjects of processing and serving continental food at SMK Negeri 3 Bogor. The results of this study support Muslim, Gitama, Suprianto, Rahmadyanti, & Kusumawati (2018) findings, that for stu-

dents who have high level of creative thinking, who learn using adobe flash professional learning media, psychomotor domain learning outcomes are significantly higher than students who learn using learning media CourseLab. As is known, that the level of success is a reflection of the personality of students who have creativity, namely the initiative to foster curiosity, believe in themselves, and have a high imagination. The Personality like this, proved significantly in achieving success in the learning process.

The importance of knowing the influence of creativity on learning outcomes is how an applied learning model can improve student learning outcomes including those who have low creativity, also increase the level of learning success. Therefore creativity as a mirror of a successful person needs to be instilled early, both in the family environment and in the school environment. With the application of the right learning model, the teacher can easily increase creativity in each student.

Furthermore, the right learning model is not only about classroom learning, but also learning when and where students are learning in order to foster such student creativity is in line with the 21st century education format stated by Hernawan, Susilana, Julaeha, & Sanjaya (2006), which includes: (1) cyber (e-learning), where learning is done by optimizing the use of ICTs; (2) open and distance learning, where learning can be done with a distance learning model, not limited to space and time, and carried out by utilizing ICT assistance; (3) quantum learning, which is ap-plying learning methods that are adapted to the way they work; (4) cooperative learning, na-mely learning that uses groups as an effort to foster cooperation between students; (5) socie-ty technology science, which is an interdiscip-linary concept that is applied to integrate prob-lems in science, technology and society; and (6) accelerated learning, which is the develop-ment of students' ability to absorb and under-stand information quickly, so as to improve their learning abilities more effectively.

CONCLUSION

Based on the results of the study, it can be shown that the consclusion are follows:

Fisrt, Learning outcomes (cognitive, affective and psychomotor domains) for students

taught using the ARIAS learning model, are significantly higher than learning outcomes for students who learn with direct learning models on the subjects of processing and serving continental food at SMK Negeri 3 Bogor; and

Second, Learning outcomes (cognitive, affective and psychomotor domains) for students, who have high creativity, are significantly higher than the learning outcomes of students who have low creativity, on subjects of processing and serving continental food at SMK Negeri 3 Bogor.

Third, the relationship between learning models and learning outcomes (cognitive, affective and psychomotor domains) in the subjects of processing and serving continental food is influenced by students' creativity.

Based on these conclusions, the following suggestions were conveyed: (1) based on the findings in this study, the ARIAS learning model needs to be applied to subjects that have more or less the same characteristics as the subjects of processing and serving continental food; (2) creativity as a mirror of a successful personality needs to be instilled early, both in the family environment and in the school environment. By applying the right learning model, the teacher can easily increase the creativity of each student.

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THE EFFECTIVENESS OF CONTENT BASED ON DYNAMIC INTELLECTUAL LEARNING WITH VISUAL MODALITY IN VOCATIONAL SCHOOL

Ketut Agustini
Ganesha University of Education

I Gede Partha Sindu
Ganesha University of Education

Kadek Angga Kusuma
Ganesha University of Education

Abstract

E-learning generally presented the same learning material because it considered the characteristics of all users to be homogeneous. In fact, every student had different characteristics in the learning process. The objectives of this study were: (1) To produce a simulation content and digital communication based on Dynamic Intellectual Learning with Visual Modality for the tenth grade at SMK Negeri 1 Seririt, (2) To find out the teacher's response and the tenth grade students at SMK Negeri 1 Seririt on Simulation Content and Digital Communication based on DIL with Visual Modality that had been generated. The method of this study was a research and development referred to the plomp model. The subjects of this study were the tenth grade of accounting program at SMK Negeri 1 Seririt in the academic year 2017/2018. There were various try out had been carried out, namely: validity testing by experts and effectiveness testing by using the Hake formula. The results showed that the simulation content and digital communication based on DIL with Visual Modality was valid and practically use: the effectiveness testing produced N-gain of 0.74 included in the effective category and the data analysis of the teacher and the students respond showed that it was categorized in the positive category. It showed that the output was valid, practical and effective to be used.

Keywords: *content based, dynamic intellectual learning, modality visual*

Contact Ketut Agustini   ketutagustini@undiksha.ac.id

Ganesha University of Education, Pegok, Jalan Raya Sesetan No.196, Sesetan, Denpasar Selatan, Pedungan, Denpasar Sel., Kota Denpasar, Bali 80223, Indonesia

INTRODUCTION

SMK Negeri 1 Seririt is a Vocational High School (*Sekolah Menengah Kejuruan/SMK*) located in Lokapaksa Village, Seririt District, Buleleng Regency. SMK Negeri 1 Seririt is an educational institution as a professional generation developer in various departments, namely Cullinary/Restaurant, Hospitality Accommodation, Boutique Clothing and Accounting. One of the subjects found in the accounting department is Simulation and Digital Communication.

Simulation and Digital Communication subjects become the basis for the use of computers and other ICT equipment to support the mastery of vocational productive subjects. Teachers and students must relate the use of ICT tools with subjects in the areas of expertise, expertise programs, and skill competencies they learned while in vocational high school.

SMK N 1 Seririt has facilities that support the learning process such as LCD, Computer laboratory and Wifi. However, the supporting facilities have not been used properly, so the learning process does not give a different impression for students. Based on the results of interviews with teachers of the Simulation and Digital Communication subject at SMK Negeri 1 Seririt, in the learning process the teacher uses the lecture method in which, the lecture method is less flexible in accommodating the development of competency material because educators must intensively adjust the subject matter with the development of new technologies one of which is e-learning.

Some students repeatedly read the material provided but unable to understand the material being read. The tendency of students to understand the material that only uses material will affect the absorption of students so that if students have the characteristics of laziness to read, then the task for a teacher is to replace the learning media used in the learning process. Therefore it is deemed necessary to make learning media related to Digital Simulation and Communication subjects adjust to the characteristics of students, so that students can learn independently and understand the learning material well.

Questionnaires distribution was conducted to students showed that students sometimes get bored with the learning media used by the teacher. Learners wanted teachers to use varied learning media, so that students could understand the material provided by the teacher. Learners wanted the learning media that is made not only in the form of text, but students have video and picture features so students learn more and are not bored with reading material.

From those problems it can be concluded that the learning media used by the teacher has not been able to overcome the existing problems. The results obtained from the teacher who teaches the Digital Simulation and Communication subject agree with the development of Digital Simulation and Communication content that is packaged in e-learning to suit the characteristics of students, namely visual modality. As many as 81.67% of all respondents agreed to use Digital Simulation and Communication content with visual modality that was packaged in e-learning.

E-leaning is an internet-based learning media to help teacher interaction with students in the teaching and learning process. Students can learn or review at any time and can be done anywhere. The increasing use of e-learning as a learning media impact many applications are made that support web-based learning media, namely LMS (Learning Management System). LMS is software that is used to create web-based online lecture materials and manage learning activities and results (Hanum, 2013). The developed LMS makes many different features appear in the learning process, especially in the problem of learning content. This then triggered the establishment of a new standard which was then agreed to become an international standard known as Sharable Content Object Reference Model (SCORM).

SCORM (*Sharable Content Object Reference Model*) was an *e-Learning* standard developed by *ADL (Advanced Distributed Learning)* as a standard distribution of e-Learning packages that could be used to accomodate various specification s and standards for web-based *e-Learning* content. *Content* was defined as content or learning material. *Content* will give a benefit to the teachers for facilitate and provide the learning material based on the standards competency, basic competencies and indicators contained in the syllabus. The purpose was that the teachers was not mistaken in giving material to the students in teaching and learning process. Mastery of information technology greatly determines the extent of the

content development in *e-learning*. *Content* in schools generally are not able adjusted learning with basic competencies and indicators. Therefore, there was a need for development that is able adjusted to the indicators and basic competencies which exist in the syllabus, namely by developing the content with the help of *e-learning* media.

The learning model used in this study is the Dynamic Intellectual Learning (DIL) learning model because DIL Model allowed the users to explore a learning content according to the characteristics of the students, the level of knowledge and learning styles of the students. E-learning generally presents the same learning material for each user because they assumed the characteristics of all users were homogeneous. Homogeneity was a characteristics of e-learning users who are considered the same, whereas in the reality each student has different characteristics in learning.

The advantages of e-learning that was homogeneous are (1) learners could review the instructional material being studied, (2) not wasted learning time if educators were unable to attend to teach in the class, (3) the students and the educators could conduct the discussions through the internet. E-learning deficiencies was homogeneous: (1) e-learning users was considered the same, (2) was unable to distinguish learning styles from the students, (3) the students who was not in accordance with the learning style, will be lazy to do the tasks given by the educator.

Schools in general need to have e-learning was able accommodated the differences in characteristics of the students, who could understand the students and tried provided /delivered the learning content called adaptive learning. The students now needed saw the learning content that was appropriate to their taste, level of understanding, and personal traits, so that the learning process would be more efficient if the needs of students was met. Adaptive learning provided learning material whose level of difficulty was in accordance with the user's ability and how presented the learning material in accordance with the learning style users.

Learning style is the way for everyone to absorb information through their senses. Everyone has a different tendency to absorb information. This causes the content learned is not in accordance with the characteristics of each student, so that what is obtained also becomes less optimal.

Based on previous research related to content research, several relevant research results were found, including Nurcahyono & Permanasari (2015) entitled The Use of Learning Content for Vocational High School Students was declared effective. From the results of research that has been carried out the trend of effectiveness in the use of e-leaning learning at SMK Negeri 2 Wonosari Gunung Kidul shows that the implementation of e-leaning learning as a learning medium in SMK N 2 Wonosari Gunung Kidul is quite effective with a tendency level of 78.15% but still there 5.25% of the implementation of e-leaning learning is not effective.

Some studies also state that some of the characteristics that influence student success in learning are motivation, knowledge ability and learning style so that the elearning content developed is adaptive according to the characteristics of the students (Esichaikul, Lamnoi, & Bechter, 2011; Sfenrianto, Hasibuan, & Suhartanto, 2013; Surjono, 2011; Suryani & Nasuha, 2014).

Based on the description of the above problems, the researcher intends to develop content that will be packaged in e-learning in this study entitled: "Development of Content Based on Dynamic Intellectual Learning with Visual Modality at SMK Negeri 1 Seririt".

RESEARCH METHOD

The research method is the basis for developing a product that will be produced. This study used the design development of the Plomp model. The development design of the Plomp model is one of the systematic design models that is appropriate for use in educational development research. This model consists of five steps, namely: (1) preliminary investigation, (2) design, (3) realization/construction, (4) test, evaluation, revision, and (5) implementation. However, the researchers did not carry out the implementation phase because the researchers had limited time.

Table 1. Table Diagram of Development Phase of plomp models

No	Plomp Phase	Methods
1	Preliminary Investigation Phase	Collect the information
2	Design Phase	Designing the products
3	Realization Phase	Producing the products
4	Test, Evaluation, and Revision Phase	Testing the validity of product

Techniques of Data Collection

Qualitative and quantitative were used in order to collect the data. Techniques of data collection in this study were using interview and questionnaires methods that researcher took from the data of teacher and student.

Questionnaires method was used in the review activities of experts in the field of study, expert of media-learning design, functional testing, individual try out, small group try out, and field try out. The experts test and functional test consists of two choices, namely Appropriate and Not Appropriate. For individual try out, small group try out, field try out, and response tests consist of five choices, namely Strongly Agree (SA), Agree (A), Less Agree (LA), Disagree (D) and Strongly Disagree (SD). Table 2 is the detail of data collection.

Techniques of Data Analysis

In this development research, the data analysis aimed to answer the formulation of the problem in conclusion. The following was the data analysis technique used by researchers, including:

Data analysis of content validity

Data analysis of content validity is intended to determine the extent to which the content that has been made meets the criteria based on the expert's assessment that is appointed by using the expert validation sheet, functional testing sheet, and becomes the basis for the revision.

Data analysis of teacher's and student's response

Data analysis of teacher's and student's response is intended to find out how the teacher's and student's response to the content developed

Data Analysis of Content Validity

Content validation was tested by content experts, media-design experts, functional testing, individual testing, small group testing, field testing, analyzing teacher's and student's responses to the development of Digital Simulation and Communication content, as described below.

Expert Validation Content

This validation aimed to find out the contents contained in the learning content. The assessment results of experts were cross-tabulation, for example for two assessors as in Table 3.

Table 2. Data collection

No	Data type	Method	Data source
1	Information about learning resource	interview and questionnaire	Teacher of simulation and digital communication subject matter
2	Information related to learning problem	interview	Tearcher of simulation and digital communication subject matter.
3	Learner characteristic	interview and questionnaire	Leaner and teacher of simulation and digital communication subject matter
4	*e-learning content validity*	questionnaire	Instructional content expert, media expert and instructional design expert
5	Fungsionality validity	questionnaire	PTI student
6	Leaner and teacher respon	questionnaire	Leaner and teacher of simulation and digital communication subject matter

Table 3.   Gregory Test Tabulation

		Assesor 1	
		Not Appropriate	Appropriate
Assesor 2	Not Appropriate	(A)	(B)
	Appropriate	(C)	(D)

Calculation of validity with the formula:

$$Validity = \frac{D}{A+B+C+D}$$

Note:

A   : Cell that shows disagreement between the two assessors

B, C : Cell that shows different views between assessors

D   : Cell that shows valid agreement between the two assessors.

Media-Design Expert Validation

Media-design validation was carried out by learning media design experts. In this case, there was validation of the exact layout of the form of learning content writing and structuring the elaboration of the material. Assessment of the results of the learning design expert test was calculated by the Gregory formula which can be seen in table 1.

Functional Testing

Functional testing is a method of testing emphasizing on carrying out functions and input checks and output data. Functional testing includes features contained in the system. This test was conducted to determine the validity of the system addressed to respondents outside the researcher.

Individual Validation, Small Groups, Fields

Individual validation is carried out by classes which have Simulation and Digital Communication subjects. The formula used to calculate the percentage of each subject could be seen as follows:

$$Percentage = \sum \frac{(Answers \times weight\ of\ each\ choice)}{n \times highest\ weight} \times 100\%$$

Note: ∑= total

Next, to calculate the percentage of the whole subject, the formula used:

$$Persentase = (F : N)$$

Note:

F : the total percentage of all subjects

N : the total subject

Gain Score Test

Calculation of the gain score test used calculations N-gain in which Gain was increased ability of students after learning. Gain was obtained from the difference between the results of the pre-test and post-test. N-gain was calculated by using the formula as follows:

$$N - Gain = \frac{Posttest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}$$

Teachers' and Students' Response Test

To calculate the analysis of teacher and student response data used descriptive statistics and the conclusion was based on Mean Ideal (Mi) and ideal standard deviation (Si). Students' responses were explored by using a questionnaire with a 5 Likert scale (values from 1 to 5) which were analyzed descriptively. The class average of teachers' and students' response scores was calculated by using the formula.

$$\bar{x} = \frac{\sum x}{N}$$

Note:

$\bar{x}$: Class averages for teachers' and students' response scores

$\sum x$: The total scores of teachers' and students' response

$\dot{N}$: the total number of teacher and student

Whereas, to find the ideal mean (Mi) and ideal standard deviation (SDi) the following formula is used:

$$Mi = \frac{1}{2}(ideal\ maximum\ score + \ ideal\ minimum\ score)$$

$$Si = \frac{1}{6}(ideal\ maximum\ score - ideal\ minimum\ score)$$

FINDINGS AND DISCUSSIONS

Content created by using e-learning as a learning medium. E-learning as a place to enter content created to help students in distance to learn by using the use case diagram design which is then applied in SCORM standard e-learning. SCORM (Sharable Content Object Reference Model) is a standard distribution of e-learning packages that can be used to accommodate various specifications and standards for web-based e-learning content. The research model used in this study was the Plomp model. This model has four stages, namely:

Preliminary Investigation phase

In the analysis phase, there were: (1) analysis of the characteristics of the field of study. The purpose of Simulation and Digital Communication subject was providing an understanding of concepts and practices regarding the use of technology and information. The characteristic of Simulation and Digital Communication subject was understanding concept and practicum (2) analysis of students' characteristics. In this analysis students wanted a learning video or material in the form of images to facilitate students' understanding. (3) Analysis of learning resources. In the analysis of learning resources, teachers use Students Worksheet (LKS), searching for teaching materials on the internet and books from the library.

Design Phase

This phase was making a design that would be applied in the next phase. The design made as follows

Figure 1.   Use case diagram for system access

Figure 2.   Use case teacher diagram

Figure 3.   Use case students diagram

Realization phase

At this stage, systems are developed such as making access right to the school yard, arranging displays in each learning activity, applying Simulation and Digital Communication content to e-learning system and applying dynamic intellectual learning stages to e-learning systems. Presentation of content Digital Simulation and Communication using a *scorm* that was first made in the adobe captivate application before being distributed to e-learning. Content that has been created in the adobe captivate application would be compressed in zip form. Product development results can be seen in Figure 4.

Figure 4.   The results of page development for Digital Simulation and Communication content

4. Test Phase, Evaluation and Revision

In the test phase of e-learning content in accordance with the role and the function in the learning process to determine the extent of the

benefits of the products developed. The test phase starts from the experts reviewed.

The result of the content expert evaluation by using Gregory test based on the questionnaire indicate that the level of achievement of the content is "Very High" and deserves to be continued. It indicates that the learning material that was implemented in e-learning content is relevant to use in learning Digital Simulation and Communication.

The results of expert evaluation of learning media by using Gregory test based on the questionnaire indicate that the level of achievement of content e-learning is declared "Very High" and deserves to be continued. This indicates that the application of intellectual learning dynamic in learning model is appropriated to use in learning.

After conducting an expert review, the next step is to conduct the functional testing of 5 respondents from Informatics Engineering student. The assessment results show that the features and processes that contained in e-learning are running well and that there are no errors or non-conformity of the results of the process expected in e-learning.

The next step is to do individual test. The subjects of individual test were 3 students of 10th grade students from accounting program. Based on the result of from Try-out questionnaire filled by each student, one student who gave very good response was (33.3), two students who gave very good responses were (66.7%). The mean score of students is 86.67%. If it converted into conversion tables that were in good category.
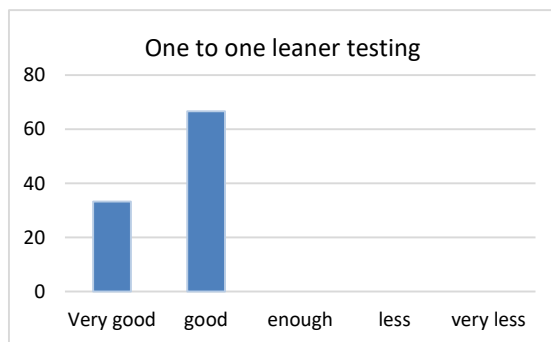
Figure 5. One to one leaner testing.

After the individual test is finished, then followed by a small group test. Test subjects of Individual test were 10th grade students from accounting program. From the results of the small group test questionnaire filled by each

students, there are two students give very good response were (20%) and eight students give a good response were (80%). The average ratings of ten students were 85.30%. If it converted into conversion tables that were in good category.
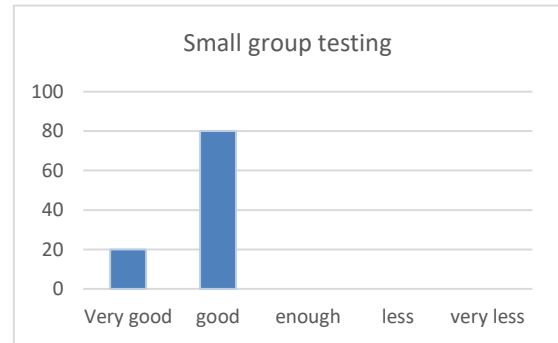
Figure 6. Small group testing

After the small group trial was completed, it continued with field tests conducted by twenty students of 10th grade students from accounting program. From the results of the field test questionnaire obtained two the students who gave very good responses were (10%), eighteen students who gave good responses were (90%). The Average score of the total field test respondents were 84.25%.If it converted into conversion tables in the level of achievement is included in either category.
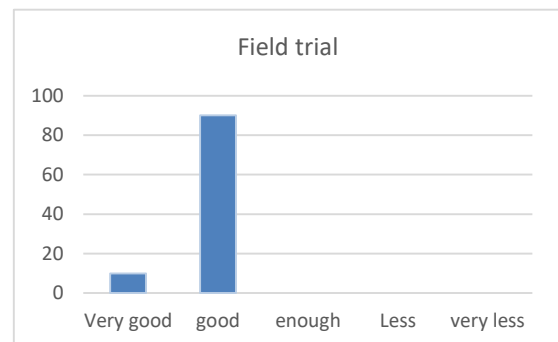
Figure 7. Field trial

After that, a gain score test that was carried out by giving the pre-test and post-test during the field test. For the N-Gain calculation formula, it is calculated by using the following formula;

$$N - Gain = \frac{Skor\ Posttest - Skor\ Pretest}{Skor\ Maksimal - Skor\ Pretest}$$
$$= \frac{8.4 - 3.9}{10 - 3.9}$$
$$= \frac{4.5}{6.1} = 0.74$$

After the calculation was obtained, the N-Gain value is 0.74, so the rate of increase in the post-test results was included in the medium criteria. For categories based on N-Gain criteria can be seen in table 4 and a comparison chart of the pre-test and post-test values can be seen on the Figure 8.

Table 4. Categories based on normalized gain criteria table.

Index	Criteria
$0.70 < g < 1.00$	effective
$0.30 \leq g \leq 0.70$	Effective enough
$0.00 < g < 0.30$	Less effective
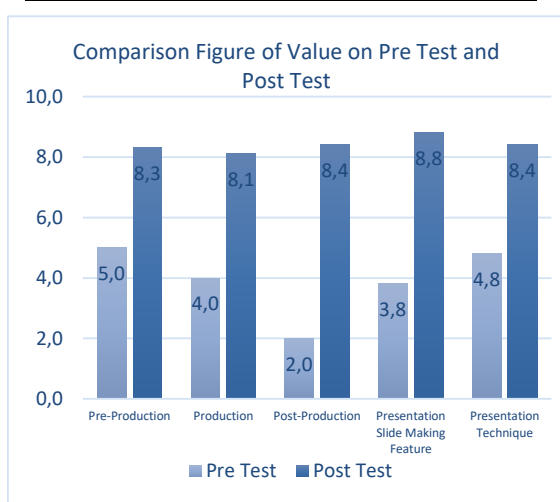
Figure 4. Comparison of pre-test and post-test scores

After that, the teacher's response was taken due to the development of Digital Simulation and Communication content which was packaged in e-learning. The teacher response test obtains an average of 45, if it is converted into the response classification criteria table, the results are included in the very positive meaningful category, and this e-learning content was very helpful in the learning process in school and understanding students to study harder.

The next test process is carried out by taking student responses. The subject of the students' response test consisted of 20 students of Grade X Accounting who had learned to use Digital Simulation and Communication content packaged in e-learning. The results of the student response questionnaire on the development of Digital Simulation and Communication content gained an average of 65.45, if converted into the response classification criteria

table the results were included in the positive category which means that students were very enthusiastic in using the e-learning system.

Based on the results of teacher and student responses, it can be categorized to help students understand the subjects of Simulation and Digital Communication subjects and gained successfully overcome from problems that exist in the teaching and learning process which has been explained previously. From the acquisition of these responses, it indicate that the learning media can increase students' motivation to learn so that they get optimal learning outcomes. This was evidenced in the study Hernawati & Aji (2016) which states that the results of testing and measuring e-leaning content in the database programming courses can increase student learning interest by 87% and 83% understand database programming material. While the results of testing on interest in e-leaning material content on average show a positive response. Besides that, it was also proven by Sindu & Paramartha (2018) which stated that the average value in learning achievement of students who learned from problem-based learning content was higher than those who learned from using conventional models. Problem-based learning content plays a role in improving student learning achievement.

From the results and discussions that have been presented, assessments made by content experts, learning media experts, individual tryout, small group tryout, field tests, and the results of teacher and student responses are categorized as good and receive a positive response. This is supported by a number of student statements, namely the existence of Digital Simulation and Communication content that is packaged in e-learning is very helpful in the learning process, content that is packaged in e-learning is very useful and understand quickly in the teaching and learning process, content packed in e-learning is very helpful in the teaching and learning process. This is evidenced in the research from Zyainuri & Marpanaji (2012) which states that the use of e-learning effectively improves students' cognitive learning outcomes.

This is evident from the results of differences in scores of increased pre-test and post-test. Besides that, it is proven in the research Tandirerung & Hadi (2014) which states the usefulness of e-learning is very beneficial

for teachers and students and the implementation of e-learning according to the teacher is increased while according to students is fixed. Based on these assessments, the development of Digital Simulation and Communication content based on Dynamic Intellectual Learning with Visual Modality for class X at SMK Negeri 1 Seririt broadly has shown success and is effectively used as a learning resource for class X students of SMK Negeri 1 Seririt.

CONCLUSIONS

Based on the results and discussion which focused on a simulation content and digital communication based on Dynamic Intellectual Learning with Visual Modality, the researcher concludes that: Fisrt, the design result and the realization of a simulation content and digital communication based on Dynamic Intellectual Learning with Visual Modality for the tenth grade at SMK Negeri 1 Seririt had been declared successful. The system design used in this research was the use case diagram which was then applied in the SCORM standard e-learning.

Second, the teacher's response to a simulation content development and digital communication based on Dynamic Intellectual Learning with Visual Modality for the tenth grade at SMK Negeri 1 Seririt, from the average obtained was 45 included in the positive category. While the students' response to the simulation content and digital communication from the average obtained is 65.45 included in the positive category. From the responds obtained, it indicates that the learning media can increase students' motivation to learn.

Based on the researcher's observation, there were several things that could be taken into consideration to be followed up. Fisrt, for other content developers in order to manage content packaged in e-learning is more user friendly or easy to use by users who are still unfamiliar with computer-based learning. In addition, it can regulate that each stage of Dynamic Intellectual Learning has features that can provide challenges in the form of games, badges or other forms so that students do not feel bored while learning by using content packed in e-learning.

Second, Product the simulation content and digital communication based on Dynamic Intellectual Learning with visual modality de-

veloped has not arrived at the implementation stage. Therefore, it is necessary to conduct further studies on the effectiveness of the use of the simulation content and digital communication relating to the measurement of student learning outcomes using this simulation content and digital communication through the experimental research.

Third, product the simulation content and digital communication based on Dynamic Intellectual Learning with Visual Modality has not done the Index of Difficulties and Differential Power Index. So, it is necessary to conduct further studies on the items through experimental research.

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THE CONTRIBUTION OF TECHNOPRENEURSHIP SCIENTIFIC LEARNING AND LEARNING READINESS TOWARDS THE ENTREPRENEURSHIP LEARNING OUTCOMES IN HIGHER VOCATIONAL EDUCATION

Hendra Hidayat
Universitas Bung Hatta

Boy Yendra Tamin
Universitas Bung Hatta

Susi Herawati
Universitas Bung Hatta

Khairul
Universitas Bung Hatta

Eril Syahmaidi
Universitas Bung Hatta

Abstract

This research was motivated by the entrepreneurship learning outcomes in vocational education which is still poor. Technopreneurship scientific learning and learning readiness are assumed to be factors affecting entrepreneurship learning outcomes. The purpose of this study is to describe and test the contribution of technopreneurship scientific learning and readiness to learning of entrepreneurship learning outcomes. This research used the quantitative method with correlation descriptive. The population was all students who follow the general course of entrepreneurship in Higher Education for 1100 people. While the samples are 217 students who were selected by using proportional stratified random sampling. This research tool was a Likert scale and a valid and reliable reading comprehension test. Data were analyzed using descriptive statistics, simple regression and multiple regressions. The research findings show that there is a contribution of both technopreneurship scientific learning and learning readiness to entrepreneurship learning outcomes.

Keywords: *technopreneurship scientific learning, learning readiness, entrepreneurship learning outcomes*

Contact Hendra Hidayat   hendrahidayat@bunghatta.ac. id

Universitas Bung Hatta, Jl. Sumatera, Ulakkarang, Ulak Karang
Utara, Padang Utara, Kota Padang, Sumatera Barat Indonesia

INTRODUCTION

Nowadays, employment problems in Indonesia are faced with the inequality between job opportunity and labour supply. This gap has led to tight competition in getting jobs. Even college graduates, it is not easy to compete in getting a job. During the 2008-2009 periods, there has been an increase in the labour force of 2.26 million people, precisely increasing from 111.48 million people to 113.74 million people. This increase in labour supply is not entirely absorbed by the labour market; it results in an unemployment rate of 8.14% or 9.26 million people. From these 9.26 million unemployed, unemployed diplomas and graduates approximately are 1,260,000 people and 1,424,000 people (BPPT, 2010). Meanwhile, small and medium entrepreneurship (SMEs) as entrepreneurs are not fully able to absorb labour significantly. From the existing data, the number of entrepreneurs in Indonesia is still very small. It is only about 0.18% of the population.

While in America has reached 11%, Singapore 7%, Korea and Japan are above 5%, European countries average is above 4%, and India is almost 2% (BPPT, 2010). Referring to the above conditions, the efforts to accelerate the growth of new businesses become very important, especially in response to the increasing supply of labour from year to year. One of the efforts to accelerate the growth of new businesses is to make breakthroughs through changing the mindset of college graduates from being as job seekers into work creators. Realizing this effort, universities have actually provided debriefing through entrepreneurship courses. However, its implementation is still more on the theory aspect. Even so, this can already be a very good capital base. Furthermore, the entrepreneurship material is just added to the technology skills, namely the ability to innovate through the application of technology. Technology-based entrepreneurship education, also known as technopreneurship, is an attempt to synergize between the theory and practice of various competencies in science related to technology and industry. Therefore, technology entrepreneurship education (technopreneurship) can be used as a learning process of a business atmosphere. Technopreneurship education in the future is very possible to be developed at universities in

Indonesia. However, in its development, universities are still facing various problems whether there is no policy or readiness from universities (teaching staff and educational infrastructure). This paper will describe the conditions of technopreneurship development and formulate models of technopreneurship development in universities

Various efforts should be made so that the function of vocational education as a media for the preparation of manpower can be realized. Among the efforts to improve the quality of education and learning to change the mindset of students related to work or livelihood. Most educational institutions in Indonesia currently only produce graduates who have the mindset as a job seeker and not as job creators. So the most important thing to do is to change the mindset of students about work or subsistence immediately to reduce unemployment in Indonesia. In addition to providing applied expertise, vocational educa-tion should also be able to give students the ability to create employment as workers. In addition, vocational students should have an interest in entrepreneurship. For this, the renewal of learning models that make students interested in entrepreneurship, creative and innovative must be conducted.

Almost all universities have entrepreneurship courses but not all of the college graduates are capable of entrepreneurship. In addition, graduates from college who graduated only rely on the diploma and competence of their respective fields to find work, but also did not get a decent job. If these conditions left ignored, the college will contribute to the increasing number of educated unemployment. Based on data from the Central Bureau of Statistics (BPS) on Unemployment Rate (TPT) of University graduates starting from February 2016, there are 7.02 million people or 5.5 percent, August 2016 are 7.03 million people or 5.61 percent, and last in February 2017 are 6.68 million people or 5.33 percent. It shows a modest rate of educated unemployment despite very little, but the intellectual unemployment rate for college graduates is very worrying.

Based on statistical data in February 2018, in Indonesia, there is 9.5 percent (688,660 people) of the total unemployed who are college graduates is no exception from graduates of vocational education. They hold a diploma three or strata one degree or bachelor

degree. From that number, the highest number of unemployed, 495,143 people, is a university graduate with a bachelor degree. The educated unemployed (both diploma and strata 1) are increasing compared to 2013 with the percentage of unemployed college graduates of 8.36 percent (619,288 people) and 8.79 percent (645,866) in 2012. This data describes that college graduates are still weak in the competition of the labour market; it is caused by, one of them, the learning process that occurs so far is still oriented to the output value.

Learning model becomes the main part in a learning process so it is very important to do a review in the form of needs analysis. If looking at the high unemployment rate among college graduates is no exception, higher education or vocational education certainly indicates the weakness of the learning process that occurred. There is no exception in the model of entrepreneurship learning. It is necessary to do the needs analysis. The direction of needs analysis of entrepreneurship learning model allows being integrated into entrepreneurship learning in higher education, in teaching and entrepreneurship learning so that learners can master the entrepreneurship material with the concept of learning by doing through the approach of production-based learning and technology. Needs analysis is a very important early stage in looking at the needs of a learning model that will be designed especially technopreneurship scientific learning model. Therefore, the purpose of this paper is to explore and explain the needs analysis of technopreneurship scientific learning model in higher vocational education.

Review about Entrepreneurship Learning in Higher Education

In achieving learning outcomes in vocational education, students will experience learning and the learning process (Hidayat & Yuliana, 2018; Hidayat, Herawati, Hidayati, & Syahmaidi, 2018; Hariyanto, Usman, & Pardjono, 2017; Murtini, 2016). Learning is the process by which an individual undertakes to gain a new behavioural change, as a result of the individual's own experience in his interaction with his environment. Meanwhile, learning can be defined as a process that contains learning and self-transforming processes resulting from efforts in the process (Moeslichatoen, 2004). Furthermore, learning is a behavioural change through activity, practice, and experience. In learning, there are some basic components involved (Hamalik, 2003). From the opinion of the experts above, it can be concluded that learning is a process experiencing by an individual who keeps them from being uninformed to the knowing part and it involves the psychological elements of the individual.

In a simple lesson of entrepreneurship interpreted is how the transfer of knowledge and attitude changes as well as the right mindset about entrepreneurship. Entrepreneurship learning is an important concern because it is closely related to entrepreneurship theory, how to teach and entrepreneurship teaching strategies. Teaching entrepreneurship is the process of facilitating individuals with concepts and skills to be able to recognize business opportunities and have insight, confidence and ability to act (McIntyre & Roche, 1999). Teaching entrepreneurship aims to inspire students, evoke emotions, and change mindsets (Al-Laham, Souitaris, & Zerbinati, 2007; Lüthje & Franke, 2003).

Besides, research on entrepreneurship theory has been studied by many experts such as decision theory (Busenitz & Barney, 1997; Hitt & Tyler, 1991) which helps us to understand why some entrepreneurs are able to see opportunities that are economically profitable while others are not. These theories are very helpful for students in facing problems in the field related to entrepreneurship issues. According to Ghoshal (2005), an effective way to teach entrepreneurship requires a combination of theory and application. Entrepreneurship education is defined as the delivery of entrepreneurial knowledge to students in terms of concepts, skills, and behaviours, followed by entrepreneurs (Pathak, 2003). In addition, of course, entrepreneurship learning stuff is supported by learning tools and entrepreneurship learning modules.

Overview about Technopreneurship Scientific Learning Model

Model is a conceptual framework that is arranged in a logical and systematic order as a guide in doing an activity. The learning model of scientific learning is a learning model to gain knowledge through two paths, namely the path of reason and the path of observation (Ibrahim, 2010). The operational form of the

learning model of scientific learning is a scientific inquiry. This scientific inquiry is defined as a systematic attempt to get answers to problems or questions. Thus, the characteristic of learning model of scientific learning is the problem solving through reasoning and observation. Similarly, Majid (2014) revealed that learning activities can be matched by a scientific process. The model of scientific learning has an important role in developing attitudes, skills, and knowledge of students. In the process of learning which meets the scientific learning criteria, the scientists put forward inductive reasoning rather than deductive reasoning. Joyce & Weil (2003) states that "the learning model is a plan or a pattern used as a guide in classroom planning or tutorial learning and to define learning tools such as books, films, tape recorders, computers, curriculum, etc". Furthermore, the application of Scientific Inquiry learning model in learning activities aims to improve students' process skills. Learning activities are done by experiment. Through experimental activities, students can try various ways to complete experiments conducted so as to develop the ability to think it.

Simply scientific technopreneurship means students are trained to actively engage in observing, trying, communicating and being able to produce products, with the resulting products containing technological elements in entrepreneurship. In addition, the students are facilitated to think creatively, analyze and able to produce products based on market and consumer needs (Ganefri, Hidayat, Kusumaningrum, & Mardin, 2017; Hidayat, 2017a, 2017b, 2017c; Kusumaningrum, Hidayat, & Ganefri, 2016). The scientific learning model of technopreneurship consists of (1) finding problems, needs analysis and learning analysis; (2) applying scientific technopreneurship cooperative approach; (3) designing a scientific technopreneurship business plan; (4) creating a product (prototype of goods or services); and (5) evaluating the work.

Phase 1; Finding Problems, Needs Analysis and Learning Analysis

Exploration of problems is important at first step. Learners can make observations as a group in the field, industry, community and also can discuss and obtain information from groups or people who need problems (Yulastri, & Hidayat, 2017). Problems encountered can be found in a solution, including complex learning problems. The investigation for such solutions should be able to involve technological elements. Problems are identified and tested by alternative formulated solutions, and then it is the birth of the embryo and the early stages of the business. As the analysis of this requirement, it needs to be useful to provide usefulness to society. In addition, analysis of learning entrepreneurship in higher education, vocational and other public higher education were undertaken to look at the facilities, infrastructure, support references, and the readiness of the students in learning (Ganefri, Hidayat, Kusumaningrum, & Mardin, 2017). Needs analysis in the community and learning curriculum is where to see the synchronization between students' competencies and competencies with technology elements so that the result of the solution is appropriate and beneficial (Hidayat, Herawati, Syahmaidi, Hidayati, & Ardi, 2018).

Phase 2; Scientific Technopreneurship Cooperative Approach

After obtaining information on the problems and alternatives of the overview solution, the discussions were conducted in groups of 4-5 people. Group discussions are aimed at technopreneurship approaches that are seeking alternative solutions, technology-based business opportunities, but also from aspects of marketing, distribution and sales. It means that all business processes from up to bottom in integration opportunities and technology internalization should be considered. The scientific technopreneurship cooperative approach is not just a simple group discussion activity. In addition, this activity is also better to train high-order thinking skills.

Phase 3; the Design of the Scientific Technopreneurship Business Plan

At this stage, students are invited to design a business plan based on the problems found in the field and are trying to find new ideas and innovative solutions. The business plan is still designed as part of the Technopreneurship Scientific Learning Model. Students who design business plan follow the value of technology-based innovation.

Phase 4; Creating the Product (Goods and/or Services Prototype)

In the form of prototypes of products and services designed, it must have been done. Products designed do not have to use high technology, but tend to have quality art. Thus, deep exploration and innovation need to produce innovations that have the highest potential of commercial value. The use of low technology with a touch of art and high beauty leads to different benefits and strengths.

Phase 5; Evaluating of the Work

Evaluation of the work is very important to look for the compatibility between what is done with the aim of workmanship. In addition, the evaluation work was carried out thoroughly to see the consistency of each stage, especially in generating Technopreneurship scientific business plans and products. Implementation of Technopreneurship Scientific Learning model in higher education towards the student gives the effect of the mindset of job seekers to job creators. Educators in the implementation of the Technopreneurship Scientific Learning model act as a facilitator, coordinator, mediator and motivator of learning activities for students. So, they are indirectly owned Entrepreneurship character, which includes unyielding, hard working and always innovating. The work produced by students and educators can be recorded. If the product has already passed the feasibility test, it is possible to obtain intellectual property rights. So as to produce a superior product and innovating entrepreneurs must go through in-depth surveys and observations of market conditions (Harms, 2015, Lackéus & Middleton 2015; Tjahjono, Maryati, & Fauziyah, 2015; Martín-Gutiérrez, Fabiani, Benesova, Meneses, & Mora, 2015; Lee, Hallak, & Sardeshmukh, 2016; Duval-Couetil, Shartrand, & Reed, 2016, Kurniawan, 2017).

Review of Learning Readiness

Readiness is the overall condition of a person who makes it ready to respond in some way to a situation. According to Hergenhahn, & Olson (2008) readiness is a prerequisite for subsequent learning. In contrast to the previous opinion of Hamalik (2003), readiness is the state of capacity existing in the student in relation to a specific teaching objective. Readiness can also be interpreted as a person's readiness or willingness to do something. An expert named Cronbach (2000) gives the meaning that readiness as a sense of all attributes or strengths that can make a person react in a certain way. While Bloom (2006) argues that learning readiness is a condition that has been prepared for an activity in learning. Then someone has been preparing all the needs associated with the learning. These needs can be physical needs and non-physical needs. Someone with the readiness of good physical conditions such as maintaining the condition of the body to stay healthy, adequate rest and others, then certainly in the process of learning, the person will have a good level of concentration in receiving learning materials provided so that it can stimulate the participation of people in the learning process.

Based on some opinions of the experts above, the authors conclude that readiness is the existence within a person that makes it ready to give answers or responses in achieving certain goals. In this research, understanding of readiness is a change of state in a person who makes it ready, able, and enough to do learning activities both in the sense of physical, psychological, and the material is ready so as to provide answers or responses to achieve learning objectives.

RESEARCH METHODS

This research used the quantitative method of a correlational descriptive type. The analysis technique uses simple regression and multiple regression which aims to test the contribution of two independent variables to one dependent variable. The instrument used was scale model *Likert*. The variables in this study consisted of three, namely: technopreneurship scientific learning (X1), learning readiness (X2), which is an independent vari-able and entrepreneurship learning outcomes (Y) as the dependent variable.
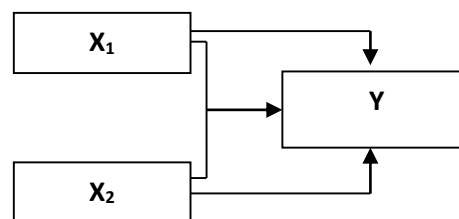

Figure 1.   Framework of Relations between Independent Variables on the Dependent Variable

The Population studying this study was students who take an entrepreneurship course in Higher Education in the number of 1100 people. As samples are 217 people. They were selected by using a *proportional stratified random sampling technique*

Main data collection instrument used in this study was in the form of documentation study on learning outcomes of entrepreneurship learning through technopreneurship scientific learning model and readiness to learn. The questionnaire was developed by researchers with a Likert scale model. The questionnaire consists of a number of statements formulated in the form of questions or statements with five alternative choices of answers in the form of attitude scales and frequency scales adapted to the purpose of the question or statement, i.e.: 1) Attitude Scale: strongly agree (SA), agree (A), disagree (DA), Slightly disagree (SD), and strongly disagree (SD); 2) Frequency scales: always (A), often (O), sometimes (ST), rarely (RR), and never (N). The use of attitude scales and scales frequency was tailored to the needs of each research variable. In accordance with the nature of the questionnaire, the weight of the statement items/positive questions were given the score 5, 4, 3, 2, and 1. While the statement/negative question statement given weight 1, 2, 3, 4, and 5.

Data Collection was conducted in Higher Education with the following procedures: (a) preparing technopreneurship scientific learning questionnaire and learning readiness; (b) provides an explanation of the instrument and how to fill it; (c) distribute the instruments and invite students to fill them out; (d) collect instruments according to plan.

Data were analyzed using descriptive statistics, simple and multiple regressions. Data analysis was assisted by using program *SPSS* version 22.00.

The hypothesis of this study is as follows:

H1 : Technopreneurship scientific learning contributes significantly to entrepreneurship learning outcomes

H2 : Learning readiness contributes significantly to entrepreneurship learning skills

H3 : technopreneurship scientific learning and learning readiness together contribute significantly to the entrepreneurship learning outcomes.

RESULTS AND DISCUSSION

Prior to the data analysis process, it needs to be tested for normality, linearity, and multicollinearity where the results are as follows.

Table 1.   Normality Test

No	Variable	Sig. (P)	Sig. alpha	Description
1	Entrepreneurship Learning Outcomes(Y)	0.181		Normal
2	Technopreneurship scientific learning (X_1)	0.200	0.05	Normal
3	Readiness Learning (X_2)	0.200		Normal

Normality test is done by using the method *Kolmogorov-Smirnov*. If *Asymp. Sig.* or *P-value* > of 0.05 (significance level), then the data is from a normally distributed population. The result of the normality test of data *Asymp. Sig.* of technopreneurship scientific learning value is 0.200; learning readiness is 0.200, and entrepreneurship learning achievement is 0.181. The three data means that the research variables are normally distributed.

Table 2.   Linearity Test

Variable	F	level significance	Conclusion
X_1 Y	9.575	0.009	Linear
X_2 Y	12.612	0.003	Linear

Based on the data above, it is found that the relationship of technopreneurship scientific learning with entrepreneurship learning outcomes is linear. The relationship of learning readiness with entrepreneurship learning outcomes is also linear.

Table 3.   Multicollinearity Test

Variable	Tolerance	VIF	Description
(Constant)			
X_1	0.820	1.219	No multicollinearity
X_2	0.820	1.219	

The next test is multicollinearity test. Based on multicollinearity test, score *VIF* of technopreneurship scientific learning is 1,219 and *VIF* of learning readiness value is *1.219* <10. Based on the result, it can be concluded that there is no multicollinearity between tech-

nopreneurship scientific learning variables with learning readiness. The further results of the testing hypothesis can be seen in the following Table 4.

Table 4. Model Summary of the Effects of All Independent Variables on Dependent Variables

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
1	0520[a]	0.270	0.249	14.409
2	0502[a]	0.252	0.231	14.587
3	0.606[a]	0.367	0.330	13.616

a. Predictors: (Constant), X1
b. Predictors: (Constant), X2

Table 4 is a table to test the influence of technopreneurship scientific learning and learning readiness towards entrepreneurship learning outcomes. In the first model, the influence of technopreneurship scientific learning is to entrepreneurship learning outcomes. The R-Square value is the level of variation of the dependent variable, which can be predicted by the independent variable. The results of analyzing the data revealed that the Technopreneurship scientific learning affords 27% of entrepreneurship learning outcomes ($R^2 = 0.270$). In the second model, the analysis showed that the learning readiness is able to predict 25.2% of entrepreneurship learning outcome variables ($R^2 = 0.252$). In the third model, the analysis showed that technopreneurship scientific learning and learning readiness together are able to predict 36.7% of students learning entrepreneurship outcome variables ($R^2 = 367$).

Table 5. The Effect of Technopreneurship Scientific Learning on Entrepreneurship Outcomes

ANOVA[a]					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1067.127	1	1067.127	17.638	0.000[a]
1 Residual	13068,071	216	60,500		
Total	14135,197	217			

a. Dependent Variable: Y
b. Predictors: (Constant), X1

Table 5 shows the effect of scientific technopreneurship on entrepreneurship learning outcomes. The F-Count value is 17,638 while F-Table = 3.88, which means F-Table is

smaller than F-Count. Other information obtained in table 5 is a significance value (0,000) below 0.05. It can be interpreted that the variable of technopreneurship scientific learning influences the entrepreneurship learning outcomes variable.

Table 6. The Effect of Learning Readiness on Entrepreneurship Learning Outcomes

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1017.169	1	1017.169	16.749	.000[a]
Residual	13118.028	216	60.732		
Total	14135.197	217			

a. Dependent Variable: Y
b. Predictors: (Constant), X2

Table 6 shows the effect of learning readiness on entrepreneurship learning outcomes. The F-Count value was obtained 16,749 while F-Table = 3.88, which means that F-Table is smaller than F-Count. Other information obtained in table 5 is a significance value (0,000) below 0.05. It can be interpreted that learning readiness variables influence the entrepreneurship learning outcomes variable.

Table 7. The Effect of Technopreneurship Scientific Learning and learning readiness on Entrepreneurship Learning Outcomes

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1557.943	2	778.972	13.316	.000[a]
Residual	12577.254	215	58.499		
Total	14135.197	217			

a. Dependent Variable: Y
b. Predictors: (Constant), X2, X1

Table 7 shows the effect of technopreneurship scientific learning and learning readiness to entrepreneurship learning outcomes. The F-Count value was obtained 16,749 while F-Table = 3.88, which means that F-Table is smaller than F-Count. Other information obtained in table 5 is a significance value (0,000) below 0.05. It can be interpreted that learning readiness variables influence the entrepreneurship learning outcomes variable.

Discussion

Technopreneurship scientific learning and Its Contribution to Entrepreneurship Learning Outcomes

Results Regression test show that technopreneurship scientific learning contributes 27% to entrepreneurship learning outcomes. Significance also shows that technopreneurship scientific learning contributes to entrepreneurship learning outcomes. The activity of students perform activities to find problems, needs analysis, and analysis of learning predicted to improve learning entrepreneurship outcomes. Technopreneurship scientific learning helps students organize or monitor cognitive, planned thinking, deliberate, goal-directed, and future-oriented mental processing that can be used to complete learning tasks that lead to learning outcomes (Okedeyi, Oginni, Adegorite, & Saibu, 2015). In addition, technopreneurship scientific learning can be used as a method in achieving a goal of learning outcomes (Nst & Sahyar, 2017). Technopreneurship scientific learning is a procedure that helps students to understand and find problems and find solutions to these problems (Daryanto, 2013). The scientific approach makes learning more active and less boring. Students can construct their knowledge and skills through the facts found in field investigations for learning. In addition, with this scientific-based learning approach, students are encouraged to be more capable of observing, asking, reasoning, and communicating or presenting the things learned from natural phenomena or direct experience. In entrepreneurship learning, for example, students can be invited to see the events, observing events, phenomena, context or situation related to the product, the type of business, so that students always remember it in the learning process. Students who are able to conduct an experiment are predicted to be able to improve academic achievement (Sadler, Foulk, & Friedrichsen, 2017). Furthermore, effective Technopreneurship scientific learning will produce good learning outcomes and can improve the quality of someone's learning (Hosnan, 2014; Rein, 2017).

Based on a previous exposure, it can be concluded that scientific learning in vocational higher education able to predict whether or not the student entrepreneurship learning outcomes. Students in knowing and understanding various materials using a scientific approach realize that information can come from anywhere, anytime, does not depend on the direction of information from the lecturer. Therefore, the expected learning conditions created are directed to encourage students to find out from various sources through observation, and not just be informed.

Learning Readiness and its Contribution towards Entrepreneurship Learning Outcomes

Based on the data analysis, it can be seen that on average the overall readiness of students is also in the low category. It means that the readiness of students still needs to be improved. The result of data analysis shows that readiness study able to predict 25,2% variable of entrepreneurship learning outcomes. The role of learning readiness toward entrepreneurship learning outcomes is a positive linear role. It means high readiness followed by high student entrepreneurship learning outcomes. Thus, students who have a high learning readiness will have high entrepreneurship learning outcomes. This is in line with the opinion of Slameto (2010) which states that the learning readiness affects student entrepreneurship learning outcomes. In the process of learning, it is needed self-preparation to deal with it. Learning is someone's way of learning something that cannot be done yet. A new person can learn something when they have had "Readiness" to learn something (Kagan, 1990; Cronbach, 2000; Muijs & Reynolds, 2001; Lally, 2010; Abu Taleb, 2013; Buldu & Er, 2016). In fact, each individual has individual differences, and then each individual has different developmental backgrounds (Bloom, 2006). This causes the pattern of formation of readiness which is also different within each individual. Similarly, readiness in learning is very influential on the personal development of a person to maturity in learning so that someone will be easy and ready to receive something that will be learned in learning itself (Kurniabudi, Rohayani, & Sharipuddin, 2015). In addition, a similar study of learning readiness was conducted by Spearman (2010) where the study assessed the attitudes, abilities and behaviours of a learner toward taking responsibility for the learning of the learner. The result, students who have high learning readiness will be able to follow the learning well and be able to develop the skills they have. Based

on the above explanation, it can be concluded that a healthy physical condition, good mental (emotional), learning needs that support the learning process and learning objectives can run well where readiness affects the learning outcomes. If student learning outcomes are not achieved well, then the learning goal also cannot be achieved well anyway.

The contribution of Technopreneurship Scientific learning and Learning Readiness towards Entrepreneurship Learning Outcomes

The research results showed that technopreneurship scientific learning and learning readiness together contribute significantly to entrepreneurship learning outcomes. This finding is obtained based on the series of data analysis that the regression coefficient of 0.606. The coefficient of determination (R Square) technopreneurship scientific learning and learning readiness towards students' entrepreneurship learning outcome is equal to 0.367. That It means the contribution of both Technopreneurship scientific learning variables and learning readiness towards the student entrepreneurship learning achievement is 36.7%, while the rest (100% -36.7% = 63.3%) is explained by other variables which are not examined in this study. As the Nst & Sahyar (2017) study, it shows that the use of technopreneurship scientific learning and can improve learning outcomes. The results of this study revealed that technopreneurship scientific learning and learning readiness together can be a factor that affects the student entrepreneurship learning outcomes. The use of technopreneurship scientific learning will have an impact on the well-being of students, in this case, is in the form of learning outcomes. This means that the scientific strategy used in learning will affect the learning outcomes obtained by students in vocational education (Mohadab, Bouikhalene, & Safi, 2018). Readiness is the initial condition for students who are ready in doing a learning activity both in the sense of physically, psychology, and the material experienced by the students themselves and able to respond to all actions in the learning process in the classroom so that the learning objectives are achieved. Students who have good learning readiness will tend to be trained to do something if they are given exercises about what has been learned. If they are trained to use scientific-learning strategies technopreneurship that have been taught then they will likely influence their learning outcomes.

CONCLUSIONS

Based on the findings and discussion of the results of research, it can be concluded as follows: (1) technopreneurship scientific learning contributes significantly to entrepreneurship learning outcomes. It means technopreneurship scientific learning has significance towards entrepreneurship learning outcomes; (2) learning readiness contributes significantly to entrepreneurship learning outcomes. It means learning readiness has significance towards entrepreneurship learning outcomes; (3) the technopreneurship scientific learning and learning readiness together contribute significantly to entrepreneurship learning outcomes. It means technopreneurship scientific learning and learning readiness have a significance towards entrepreneurship learning outcomes. It can be said that the high level of entrepreneurship learning outcomes is not only influenced by one variable only (technopreneurship scientific learning and readiness to learn) but also influenced together by technopreneurship scientific learning and readiness to learn.

Furthermore, based on the results of this research, it is suggested to lecturers, students and higher vocational education to be able to use scientific learning entrepreneurship. In addition, for researchers can be a reference and development of advanced research.

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EMPLOYABILITY SKILLS OF VOCATIONAL SCHOOL STUDENTS IN PALU CITY FOR ENTERING THE WORK WORLD

Pusriawan
Universitas Negeri Yogyakarta

Sunaryo Soenarto
Universitas Negeri Yogyakarta

Abstract

This study aims to determine how much the level of employability skills of students of State Vocational Schools in Palu City. This type of research is a type of survey that is to describe the attitudes, behaviors, and opinions of students' research employability skills using a quantitative deskriptive approach, then the results of data analysis are described qualitatively, then presented in graphs, diagrams, tables, mean, modes, medians, standard deviation and variant. The population in this study was 1,275 students with a study sample of 295 students. The data collection technique used is using a questionnaire. The results of the study indicate that the level of employability skills of vocational students in Palu is generally categorized as very high. The high level of employability skills of students in the State Vocational School in Palu should be a supporting factor for students to get decent work and in accordance with their competency skills so that stakeholders, especially the school must really use it well.

Keywords: *descriptive, employability skills, work world*

Contact Pusriawan uci7277@gmail.com

Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Depok, Sleman 55281, Yogyakarta, Indonesia

INTRODUCTION

The progress of economy and technology in this era of globalization increasingly demands the availability of qualified and competent Human Resources (HR) in all business sectors in order to be able to face increasingly sharp competition. This development also makes changes in the world of work. Simple and manual knowledge-based jobs are replaced with jobs that require the skill of applying complex knowledge and communication. Billet (Sudira, 2016) said: There are 4 things that need to be considered related to changes in the world of work and working life, namely: (1) what types of jobs are available; (2) how everyone can participate in the work; (3) what competencies are needed in work; (4) whether they can participate well in the work. Therefore how to anticipate developments and changes in the world of work is a necessity. One important sector to consider in facing the challenges of globalization is the education sector. This sector is expected to play a role in providing services, especially producing graduates who have excellence and are able to compete in global situations.

Education is an important aspect that is the main need of every human being. Education creates a change in attitude and ethics in a person. These changes start from the less good to be the better, from the less understanding to the more understanding, and so on. The problem of education is a problem that concerns the interests of all people, not only concerning investment and the condition of the nation in the present, but the impact will be felt in the future (Kuncoro, 2009, p. 2). Through education programs, Indonesian people can improve their competence in various fields and development sectors, especially in the world of education where graduates must be able to compete with other nations and be ready to fill existing jobs.

Vocational High School (*Sekolah Menengah Kejuruan*/SMK) is substantially one of the educational institutions that aims to produce graduates who are ready to work, entrepreneurial, intelligent, competitive, and have national identity and are able to develop local excellence and be able to compete in the global market. The vocational education system is required to produce learning outcomes that are in accordance with the needs of the workforce (Wagiran, 2009). These objectives are listed in the National Education System Law No. 20 of 2003 Article 15 which mentions the specific objective of Vocational Schools is to prepare students to become productive human beings, able to work independently, fill job vacancies in the business world and the industrial world as middle-level workforce in accordance with the competencies in the chosen expertise program. Clark & Winch (2007) states that vocational education is an effort to develop social workforce, maintain, accelerate, and improve the quality of a particular workforce in order to increase community productivity.

The vocational education curriculum is specifically designed to facilitate students to be able to master a field of expertise both in hard skills and soft skills aspects in the hope of becoming HR who are ready to enter the workforce and engage in community life, and have a good attitude and in accordance with the prevailing norms in society. The employment sector in Indonesia in general there are still gaps that occur between skills possessed by employers and industrial needs. This can be proven by the still high proportion of unemployment rates for SMK graduates. Based on data from the Central Bureau of Statistics (BPS), central Sulawesi shows that the data on the number of open unemployment rates (TPT) of SMK is the second largest contributor, this number will always increase because every year every vocational school, especially in the city of Palu will surely pass its students there are thousands, but not all graduates can be accommodated in the workforce.

Vocational education is believed to have a large contribution to the development of society and the improvement of the economy of a country. State competitiveness depends a lot on workers who have the knowledge and skills, because they will increase efficiency and value added production. Vocational education and training in essence is a place to prepare a knowledgeable, skilled, and personable workforce to meet the expectations of the world of work and industry. But the real conditions show that many graduates of vocational education do not get work, even those who have worked face a problem of skills. Provision of knowledge and skills they have is not enough to be able to sustain in the work environment. One of the reasons is because the workforce does not have sufficient employability skills

such as the demands of the workforce. For this reason, vocational education institutions are expected to anticipate developments in the workforce precisely through various learning approaches to be more flexible in responding to the rapidly changing demands of the workforce.

The problem of educated unemployment compared to educated non-unemployed is precisely the more complex educated unemployment. This is because unemployed non-educated people are willing to work in the non-formal sector, while educated unemployed are equipped with the knowledge they have to work in the formal sector to get high salaries and 'prestige' in the community.

In fact, the learning process in SMK prioritizes the formation of Hard skills as a provision given to graduates to be able to compete in the workforce. Hard skills are technical skills that can be measured and observed. Every vocational school graduate should have hard skills as well as soft skills. Soft skills are non-technical skills that are important for SMK graduates. Soft skills allow a person to adjust to work they have not mastered. On the other hand, activities carried out in the industry are not only using technical skills, but also there are activities of interaction with others. People are required to work together with one another. Vocational graduates are also required to solve problems that arise in the workplace. In addition, SMK graduates are also required to be able to manage themselves and develop themselves to have good careers. Therefore, soft skills are a necessity to produce competent vocational graduates. One form of soft skills is employability skills. Employability skills are non-technical skills needed by each individual, both job seekers and workers themselves, that can be transferred and learned through both habituation and training. Employability skills are general in nature and across all types of industries, business sizes, and employment levels ranging from entry level workers to the highest positions (Robinson, 2000).

The empirical facts show that the goal of implementing vocational education has not been achieved. Not all vocational graduates can meet the demands of employment according to their specialization. This is caused by a gap between the skills possessed by vocational graduates and the skills needed in the industrial world. Provision of skills and knowledge acquired at school is not enough to answer the needs of the workforce. According to Hanafi (2012), there are several factors that are identified as being problems that are not absorbed by graduates of vocational education, including: (1) the information obtained is not sufficiently supportive for obtaining employment; (2) industries generally look for experienced workers; (3) industry complaints that many SMK graduates do not have appropriate skills, especially employability to survive and survive in various situations and working conditions.

The characteristics of the world of work and the qualifications of labor needed by the industry in the XXI century are changing rapidly (Tome, 2007, p. 336). This change is caused by the rapid development of technology. The impact of this technological development not only increases work efficiency, but also affects changes in the workplace, how to work, the formation of work organization structures, and will bring more competitive competition. According to Rojewski in Hanafi (2014) there are four changes in the current workplace, namely (1) a shift from quantity to quality; (2) increased competition for labor; (3) data processing with information technology; (4) restructuring in the workplace.

One of the characteristics of the XXI century industry is the increasing need for generic skill attributes that must be possessed by workers (Gibb, 2004). Employability skills set by UNESCO (2012) as an important skill for implementing and maintaining one's job. They need a variety of skills that can be transferred and adapted to work and environmental needs. Employability skills include problem analysis and choosing the right solution, communicating effective ideas and information, being creative, showing leadership and awareness, and showing entrepreneurial abilities. Research conducted by Hanafi (2012) states that many vocational education graduates do not get jobs because they do not have skills, one of which is employability skills. Therefore, work-oriented education through the mastery of technical skills and employability skills is needed to sustain economic development in the XXI century (Esposto & Meagher, 2007).

Employability skills are a skill that must be owned by a prospective workforce and also people who have worked. Bennett (2006) states that the biggest challenge in the world of vocational education is to produce graduates who

have academic skills, abilities in mastering specific skills (technical skills), and balanced employability skills. Sudana (Hartiningtyas, Purnomo, & Elmunsyah, 2016) Vocational graduates can become skilled and qualified workforce if they truly master the hard skills and soft skills aspects. Hard skills aspects are technical skills, while soft skills are behavioral skills. Hard skills and soft skills are formed through the learning process in accordance with the competence of their skills, both during class hours and outside of school hours. The formation of attitudes that support aspects of students' employability skills requires a periodic and continuous process that is massive and comprehensive, so that vocational graduates can meet the standards needed by the workforce and industry and become professional workforce.

Sudira (2011, p. 43) in his dissertation downgraded the definition of employability skills into a set of non-technical and transferable skills needed to obtain, maintain, and develop one's career in the workplace. Employability skills have a transferable nature which means that employability skills can be used under any circumstances. As an example of problem solving as one aspect of employability skills, one can use problem solving skills either at home, at work, or in other circumstances. This is what is meant by transferable. Employability skills are also very much needed in the era of 21st Century Skills.

In the implementation of Vocational High Schools (SMK), there are several competency skills. Determining the type of competency skill is influenced by employment opportunities or labor requirements. In Palu city there are 8 State Vocational Schools with various skill competencies which are expected to produce graduates who are ready to work in their respective fields. Based on this, the preparation of graduates in accordance with the demands of the XXI century must be sought to produce quality graduates. From the explanation that has been reviewed previously, it can be concluded that qualified graduates from educational institutions, especially Vocational Schools, which are in accordance with the demands of the XXI century industry are graduates who have high employability skills, in addition to academic abilities and technical abilities. Therefore, based on the background described, it is deemed necessary to examine the "employability skills of vocational students in the city of Palu to enter the workforce".

Based on the above problems, this study will measure aspects of employability skills possessed by vocational students in Palu City in entering the workforce by looking at how much the level of employability skills of vocational students in the city of Palu? This study aims to determine how much the level of employability skills of students of State Vocational Schools in Palu City.

RESEARCH METHODS

The type of research used is a type of survey. Research uses a quantitative approach. This research is only limited to describing how high the level of student employability skills is by presenting it in the form of diagrams and numbers with descriptions in sentence form. This study involved respondents in class XII of State Vocational Schools in Palu City who had implemented apprenticeship. The population in this study was 1,275 students with a study sample of 295 students. Then the next step is to determine the sample in each school by using Purposive Sampling technique, namely the selection of samples with certain considerations with the aim that the data obtained later can be more representative (Sugiono, 2010). The data collection technique used is using a questionnaire.

This study uses one variable described into several indicators, namely communication skills, teamwork skills, problem solving skills, skills in taking initiatives and efforts, skills in planning and managing activities, self-management skills, learning skills, technology skills, occupational health and safety skills. The research data will be analyzed descriptively. Analysis is used to calculate the mean, median, mode, standard deviation, data distribution table, and chart categories in sentences. The category according to Wagiran (2013) is divided into four, namely very high, high, medium, and low.

RESULTS AND DISCUSSION
Results

The results of the study are presented in the form of the results of calculations of central tendencies (mean, median, mode), and data distribution. Presentation of data distribution

includes variants and standard deviations. Next is the presentation of the size of the frequency distribution and interperetation of the research data. Where the interpretation refers to four categories namely very high, high, medium and low. The description of the variable data on employability skills of students of State Vocational Schools in Palu City consists of nine aspects as follows:

Communication Skills

Communication Measurement of students of State Vocational Schools in the Palu city used questionnaires as many as 10 items. Based on the calculation results using SPSS software, the percentage of the score tendency in the communication skills aspects of the students of State Vocational Schools in Palu can be seen in Figure 1.
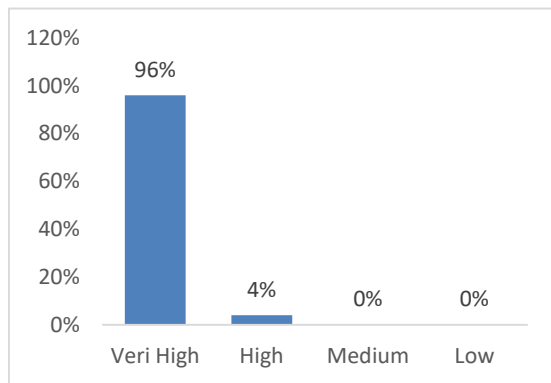
Figure 1.   Communication Skills Graph

Figure 1 shows that the communication skills of state Vocational students in Palu city generally have a very high category (96%). Achieving scores on the communication skills aspects of the students of State Vocational Schools in Palu obtained a total score of 7,887 from the highest score set at 12,920 so that the score of the communication aspect obtained a percentage of 61.04% from the score with the very high category.

Collaboration Skills with TIM

Measurement of collaboration with the team using questionnaires as many as 6 items. Based on the results of the calculation, the percentage of the tendency to score aspects of the skills of cooperation with the team in students of State Vocational Schools in the city of Palu can be seen in Figure 2.
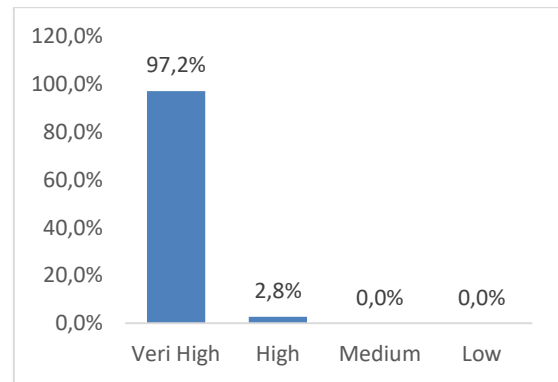
Figure 2.   Graph of Teamwork Skills

Figure 2 shows that the aspect of collaboration skills with the team of state vocational students in the Palu city in general has a very high category (97.2%). The achievement of scores on aspects of cooperation skills with the team obtained a total score of 5,738 from the highest score set at 7,758. so that the score of the aspect of collaboration skills with the Team obtained a percentage of 74.02% of the score in the very high category.

Problem Solving Skills

Measurement of problem solving skills using a questionnaire of 7 items. Based on the results of the calculation, the percentage of score tendency aspects of problem solving skills by students of State Vocational Schools in the city of Palu can be seen in Figure 3.
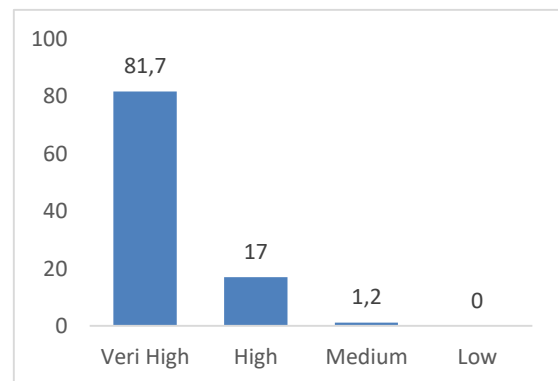
Figure 3.   Problem Solving Skills Diagram

Figure 3 shows that the aspects of problem solving skills by students of State Vocational Schools in the Palu city in general have a very high category (81.7%). The achievement of the score of the problem solving skills aspect by the students of the State Vocational School in Palu obtained a total score of 5,830 from the highest score set at 9,044, so that the score of

the problem solving skills gained a percentage of 64.46% from the score with very high category.

Skills in Taking Initiatives and Trying

Skill measurement in taking initiatives and trying to use a questionnaire of 5 items. Based on the results of the calculation, the percentage of the score tendency of Skills aspects in taking initiatives and endeavors by students of State Vocational Schools in the city of Palu can be seen in Figure 4.
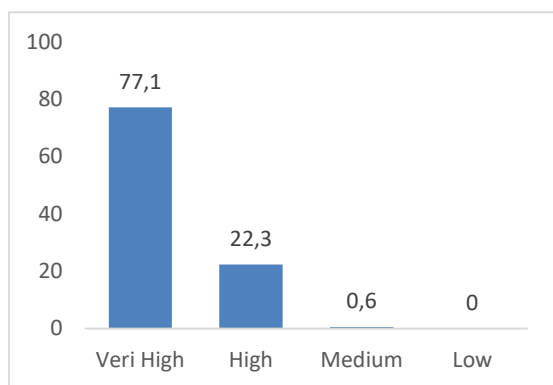
Figure 4. Skills Diagram in Taking Initiatives and Trying

Figure 4 shows that the Skills aspect in taking initiatives and endeavors by state Vocational School students in the Palu city in general has a very high category (77.1%). Achieving the Skills aspect score in taking initiatives and efforts by the students of State Vocational Schools in Palu obtained a total score of 4,120 from the highest score set at 6,460, so that the skills aspect score in taking the initiative and trying to obtain a percentage of 63.78% of scores with very high categories.

Skills Aspects Plan and organize Activities

Measuring skills for planning and organizing activities using questionnaires as many as 5 items. Based on the results of the calculation, the percentage trend score aspects of the skills of planning and organizing activities by students of State Vocational Schools in the city of Palu can be seen in Figure 5.
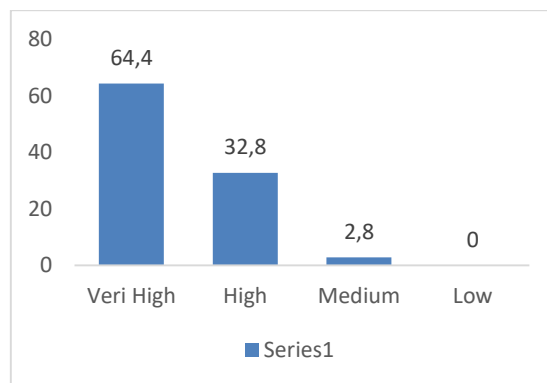
Figure 5. Skills Diagram for Planning and Organizing Activities

Figure 5 shows that the Skills aspect of Planning and organizing Activities by State Vocational School students in the Palu city in general has a very high category (64.4%). Achieving Skills aspect scores Planning and organizing Activities by State Vocational High School students in Palu city obtaining a total score of 4,222 from the highest score set at 6,460, so the Skill Aspect Planning and organizing activities score gets a percentage of 65.36% of the scores with very high categories. Percentage of score tendencies Skills Aspects Planning and managing activities can be seen in Figure 5.

Self Management Skills

Measurement of self-management skills using questionnaires as many as 9 items. Based on the results of the calculation, the percentage of the tendency to score aspects of the skills of Self-Managing skills by students of State Vocational Schools in the city of Palu can be seen in Figure 6.
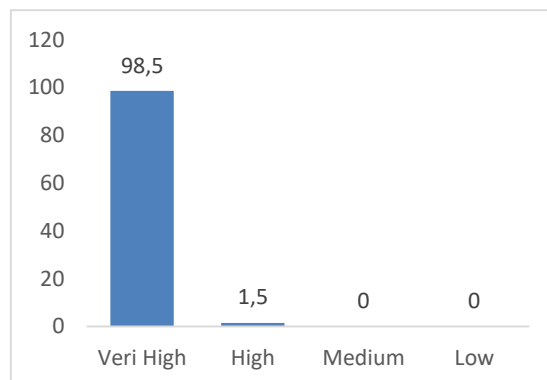
Figure 6. Self Management Skills Diagram

Figure 6. shows that the aspects of self-management skills by students of State Vocational Schools in the Palu city generally have a very high category (98.5%). The achievement of the score aspects of the self-managing skills of the students of the State Vocational School in Palu obtained a total score of 8,506 from the highest score set at 6,460, so that the score on the aspects of self-management skills obtained a percentage of 73.15% from the score with very high category.

Skills in Learning

Measurement of skills in learning using questionnaires as many as 7 items. Based on these results, the percentage of the tendency to score skills aspects in student learning by students of State Vocational Schools in the city of Palu can be seen in Figure 7.
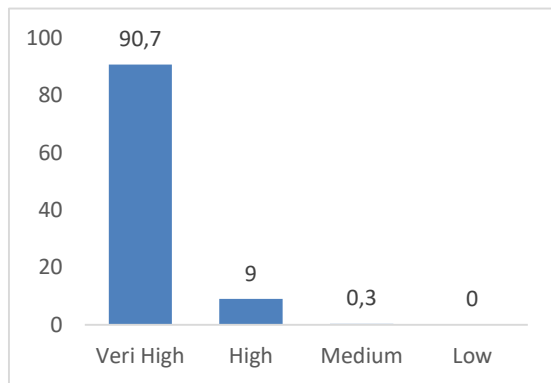
Figure 7.   Skills in learning diagrams

Figure 7. shows that the skills aspect of learning by students of State Vocational Schools in the Palu city in general has a very high category (90.7%). Achieving the score of the skill aspect in student learning at the State Vocational School in Palu obtained a total score of 8,506 from the highest score set at 6,460, so the score in the learning skills aspect gained a percentage of 73.15% from the score with the very high category.

Skills in Using Technology

Measuring skills using technology uses a questionnaire of 7 items. Based on the results of the calculation, the percentage of the tendency to score the skills aspects of using technology by students of State Vocational Schools in the city of Palu can be seen in Figure 8.
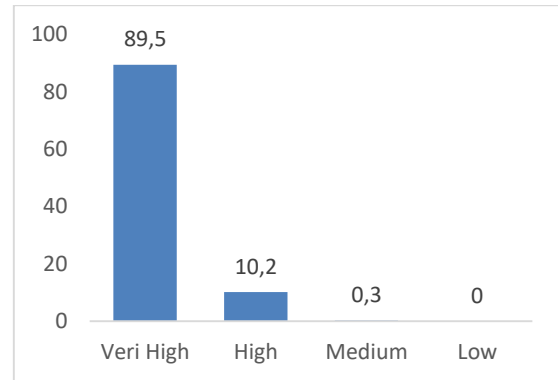

Figure 8.   A skill diagram using technology

Figure 8. shows that the skills aspect of using technology by students of Public Vocational Schools in the Palu city in general has a very high category (90.7%). Achieving the score of the skill aspect using technology obtained a total score of 6,364 from the highest score set at 9,044, so that the score of the skill aspect using technology obtained a percentage of 70.37% of the score with a very high category.

Occupational health and safety skills

Measurement of occupational health and safety skills using questionnaires as much as 4 items. Based on these results, the percentage trend score of the skill aspects of using technology by students of State Vocational Schools in the city of Palu can be seen in Figure 9.
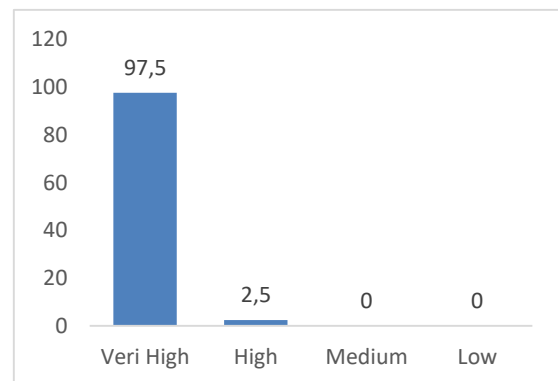
Figure 9.   Skills diagram using technology

Figure 9. shows that aspects of occupational health and safety skills generally have a very high category (97.5%). The achievement of the score on the aspects of occupational health and safety skills of the students of the State Vocational School in Palu obtained a total score of 4,060 from the highest score set at 5,168, so that the score on the skill aspect

using technology received a percentage of 78.56% from the very high category.

Table 1. Comparison of the Aspect Levels of Employability Skills of State Vocational School Students in Palu City

Skills	Mean	The mean is divided by mom	Rangk
Occupational health and safety skills	12,6	3,14	1
Collaboration Skills with TIM	17,8	2,96	2
Self Management Skills	26,3	2,93	3
Skills in Learning	19,9	2,84	4
Skills in Using Technology	19,7	2,81	5
Skills Aspects Plan and organize Activities	13,1	2,61	6
Problem Solving Skills	18,05	2,58	7
Skills in Taking Initiatives and Trying	12,8	2,55	8
Communication Skills	24,4	2,44	9

If sorted according to the highest average value to the lowest average value, the levels of the student's skills in order are occupational health and safety skills, teamwork, self-management, learning, using technology, planning and organizing activities, solving problems, take initiative and effort and communication.

Discussion

The results of the study indicate that the level of employability skills of vocational students in Palu is generally categorized as very high. If viewed from the level of vocational student employability skills in each aspect, the highest employability skill of the SMK students in the Palu is in the aspect of occupational health and safety skills with an average value of 3.14; and the lowest aspect of the employability skill is in the communication aspect with an average value of 2.44.

The results showed the highest aspects of the employability skills of state Vocational High School students in Palu city were occupational health and safety aspects. This is possible for this aspect to be easier to be taught and trained to students in the learning process. Likewise the aspects of teamwork, self-management, learning, using technology and communication which are the next ranks. As with the aspects of planning and managing activities, solving problems, taking precursors and trying. These aspects are strongly influenced by high-level thinking skills (HOTS). This really depends on the level of students' ability to develop these skills.
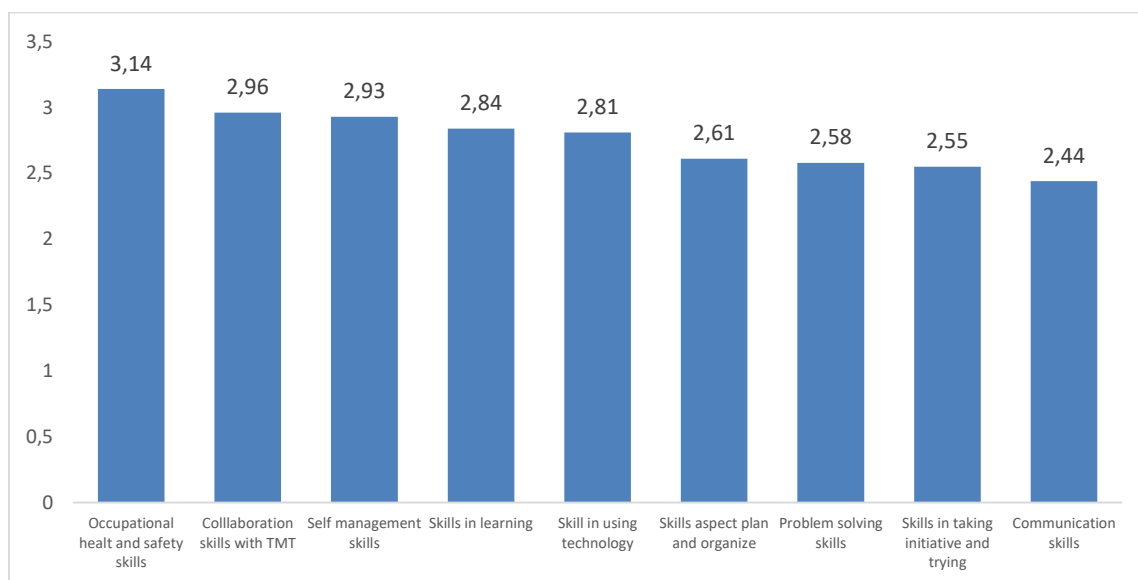
Figure 10. Graph of Comparison of Aspect Levels of Employability Skills of Vocational School Students in Palu City

At present the world of work requires workers who not only have technical skills, but also employability skills. Indeed aspects of employability skills can be taught and developed in the classroom environment through the right learning approach. This is in accordance with the research conducted by Philip et al. (2015) which states that at the beginning of the curriculum, employability skills can be developed through learning where the curriculum compilers are required to participate in DUDI. Asonitou (2015) explains that attitudes, methods and practices need to be re-examined in relation to teaching and learning approaches, assessment and work-based education.

As the results of the research conducted by Lane (2016), that collaborative learning allows students not only academic learning, but also to develop interpersonal and group skills needed for teamwork, developing leadership skills and improving communication skills. Furthermore, according to Cleary, Flynn, Thomasson, Alexander, & McDonald (2007) employability skills can be developed through academic assignments, work practices, industry-based learning, and cooperative learning integrated with work. In addition, it can also be done in various activities such as work experience, problem-based learning, and project-based learning (Smith & Comyn, 2003). Human factors or attitudes of educators and students who are directly involved to ensure the success of the learning process will make students see, understand and be confident in applying knowledge. This will benefit students before entering the work environment after graduation because they can have many employability skills. Gowsalya & Kumar (2015) in their study stated that work skills are needed. Being clever in one skill cannot facilitate other competencies. Therefore a job applicant must be multi-tasking in getting and maintaining a job. Kavoura (2013) explained that the way to communicate students with the public in various sectors needs to be considered by organizations and countries. On the other hand Sakas, Vlachos, Nasiopoulos (2014) in his study stated that Technology underlies the development of competitive advantage.

CONCLUSION

The level of employability skills of vocational students in Palu is generally cate-gorized at a very high level. If viewed from the level of vocational student employability skills in each aspect, the highest employability skill of the SMK students in Palu is in the aspect of occupational health and safety skills with an average value of 3.14; and the lowest aspect of the employability skill is in the communication aspect with an average value of 2.44. The high level of employability skills of the students of State Vocational Schools in Palu should be a supporting factor for students to get decent work and in accordance with their competency skills so that stakeholders can really use it well.

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CONTINUING PROFESSIONAL DEVELOPMENT TOWARDS TEACHERS' PERFORMANCE AT VOCATIONAL SECONDARY SCHOOLS IN SURAKARTA

Isti Setya Rini
Universitas Sebelas Maret

Ismi Dwi Astuti Nurhaeni
Universitas Sebelas Maret

Cicilia Dyah Sulistyanngrum Indrawati
Universitas Sebelas Maret

Abstract

Continuing Professional Development is a program from the government so that teachers can develop their performance. Continuing Professional Development includes: self-development, scientific publications, and innovative work. This study aims to determine the effect of Sustainable Professional Development (self-development, scientific publications, and innovative work) on the performance of vocational business and management teachers in Surakarta. This study uses a quantitative method with Structural Equation Modeling Partial Least Square (SEM-PLS) analysis. The study sample was 158 business and management vocational teachers in Surakarta, Indonesia. The results of the study show that 1) self-development has a positive and significant influence on teacher performance of 0.333 and the statistical value of T is 5.028≥1.96; 2) scientific publications have a positive and significant effect on teacher performance of 0.225 and T statistical values of 1.763≤1.96; and 3) innovative works have a positive and significant effect on teacher performance of 0.282 and the value of T statistics is 1.810 .91.96. Therefore, vocational business and management teachers need to improve professional development through scientific publications and innovative work.

Keywords: *self-development, scientific publication, innovative work, and teachers' performance*

Contact Isti Setya Rini ✉ istisetyarini@student.uns.ac.id

🖥 Universitas Sebelas Maret, Jl. Ir. Sutami No.36 A, Pucangsawit, Jebres, Kota Surakarta, Jawa Tengah 57126, Indonesia

INTRODUCTION

Education has an important role for the progress of a nation for example by producing graduates who have high Human Resources (HR). This cannot be separated from the role of the teacher in realizing the goals of national education. Therefore, the government is now very serious in handling quality improvement in the field of education. One effort to improve the quality of education is by increasing teacher performance (Susanto, 2012, p. 198; Warastuti & Usman, 2013, p. 375; Mahmud, 2016, p. 19; Sutiasih, 2017, p. 98). Teachers are required to have four basic competencies to meet high performance (Destiana & Soenarto, 2014: p. 286). The basic competencies possessed by the teacher include pedagogic, professional, social, and personality competencies. Especially teachers who teach in vocational education, they are required to have high performance to prepare and develop human resources who are able to work professionally in their fields. Vocational High School Education (SMK) must be able to keep up with the technological development of the business world or the industrial world.

The improvement of the performance of vocational teachers is still below average (Sutiasih, 2017, p. 98). In Surakarta, based on the results of the 2015 Teacher Competency Test (*Uji Kompetensi Guru*/UKG), out of 10,900 teachers who participated in UKG 42% of them received grades below the specified standard, namely 831 vocational school teachers. This shows that 831 vocational school teachers in Surakarta City both public and private vocational schools have not fulfilled qualifications as professional teachers (Wardhani, 2017, p. 79). According to Murtini, Sawiji, & Rapih (2017, p. 1) several factors that cause low UKG scores include lack of professional competence, lack of pedagogical competencies, lack of IT mastery, and too much workload that results in low teacher performance reflected in UKG scores. This means that the teacher has not carried out his performance optimally, so he needs to improve his professionalism as a teacher.

Teachers must always develop their competence and professionalism in order to stay awake and always increase in accordance with the needs and demands that develop. Therefore, the government has made efforts to improve teacher professionalism in Indonesia. The government program is contained in the Regulation of the Minister of State for Administrative Reform and Bureaucratic Reform Number 16 of 2009, namely Continuing Professional Development. Continuing Professional Development is carried out in accordance with the teacher's need to achieve professional competency standards or improve teacher competency above standards while having implications for obtaining credit scores for teacher promotion/functional positions. The principles of Continuing Professional Development are: (1) professional development of sustainability is the individual's own needs; (2) need to be carried out Continuingly and always be proactive to improve self-performance; and (3) awareness to develop professionalism (Sujianto, 2013, p. 160).

Continuing professional development as a strategy that can facilitate the development of teachers to meet the contemporary needs of the education system (Sahlberg, 2011, p. 170). Teacher development includes systematically planned experiences to encourage professional growth and development (Huang, 2016, p. 926). If Continuing professional development is carried out Continuingly, the impact on teacher performance is high. But in reality, there are still many teachers who have not improved their professionalism well and Continuingly. According to Susanto (2012, p. 198) there are still few teachers who conduct classroom action research or scientific papers to improve their professionalism. Continuing Professional Development includes three things; namely self-development, scientific publications, and innovative works. Self-development includes the participation of teachers in functional training, attending seminars or workshops and collective activities that enhance teacher professional competence. Scientific publications include the participation of teachers in conducting scientific publications or research results and publicizing textbooks or enrichment books. While innovative works include activities undertaken by the teacher in finding innovations in the form of appropriate technology for subjects taught, creating or modifying learning aids, and following the development of standardized questions and updating the material being taught.

In connection with this, there is a need for in-depth research on Continuing professio-

nal development. But in this study more in-depth about self-development, scientific publications, and innovative work to improve teacher performance, especially business and management vocational teachers in Surakarta. The purpose of this study was to determine (1) the effect of self-development on teacher performance in vocational schools throughout Surakarta; (2) the influence of scientific publications on teacher performance in Vocational Schools in Surakarta; and (3) the influence of innovative work on teacher performance in Vocational Schools in Surakarta.

RESEARCH METHOD

The method used in this research is quantitative with survey methods. Because this research uses a quantitative approach of the survey method, questionnaires are used to obtain sample data taken from the population. Then, the data that have been collected processed by using the hypothesis testing. They are analyzed by using Structural Equation Modeling (SEM) analysis which is supported by Partial Least Square (PLS) computer program version 3.0. The result of the analyzing data are analyzed based on the existing research variables. The existing variables are self-development "*pengembangan diri*", scientific publication "*publikasi ilmiah*", innovative work "*karya inovatif*", and teachers' performance "*kinerja guru*".

The sample is part of the number and characteristics possessed by the population (Sugiyono, 2010, p. 389). The sampling technique used proportional random sampling technique by lottery. Proportional random sampling is the technique of taking proportions to obtain a representative sample, taking subjects from each stratum or regionally balanced or comparable in each region (Arikunto, 2006, p. 127). The details of the number of samples are as follows:

Table 1. Details of the number of samples

School	Number of Teacher Populations	Number of Samples
SMKN 1 Surakarta	65	39
SMKN 3 Surakarta	85	51
SMK Batik 1 Surakarta	60	36
SMK Batik 2 Surakarta	53	32
TOTAL	263	158

Based on the table above, the sample in this research were 158 vocational high schools of business and management teachers in Surakarta. The sample was taken by using Slovin.

Data analysis techniques was Structural Equation Modeling (SEM) with Smart PLS (Partial Least Square) software. In PLS Path Modelling, there are 2 models namely the outer model and the Inner model. Testing criteria are carried out on both models.

Outer model (Evaluation of Measurement Model)

This model specifies the relationship between latent variables and their indicators or it can be said that the outer model defines how each indicator relates to its latent variables. Tests carried out on the outer model are: (a) Convergent Validity. The convergent validity value is the value of the loading factor on the latent variable with the indicators. Expected value is > 0.7; (b) Discriminant Validity. This value is a cross loading value factor that is useful to find out whether the construct has adequate discriminant. Comparing the loading value in the intended construct must be greater than the loading value with another construct; (c) Average Variance Extracted (AVE). Expected AVE value is > 0.5; (d) Composite Reliability. The data that has composite reliability > 0.8 sounds high reliability.

Inner Model (Structural Model)

Tests on structural model are carried out to examine the relationship between latent constructs. Some tests for structural model are: (a) R Square on endogenous constructs. The R Square value is the coefficient of determination in the endogenous construct. According to Ghozali (2011), the R square value is 0.67 (strong), 0.33 (moderate) and 0.19 (weak); (b) Estimate for Path Coefficients, is the value of the path coefficient or the magnitude of the relationship or the effect of the latent construct carried out by the bootstrapping procedure.

The research was designed to determine the effect of three independent variables (exogenous), namely self-development, scientific publications and innovative work and one dependent variable (endogenous), namely teachers' performance. The effect constellation between exogenous variables and endogenous variables can be described as the research design in the Figure 1.
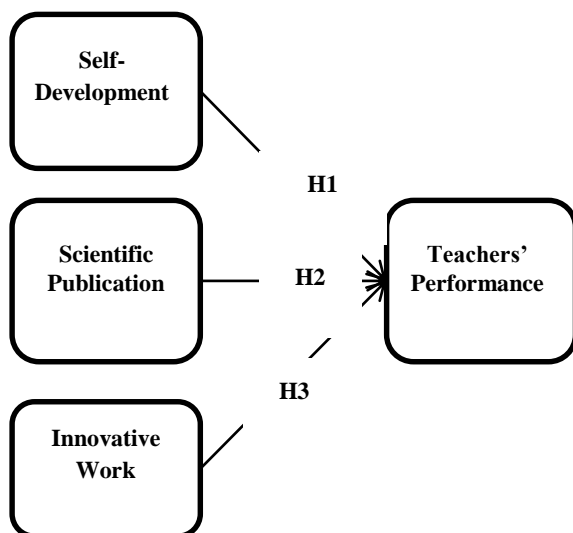
Figure 1. Hypothesis

Research Hypothesis
H1 : There is an effect of self-development towards teachers' performance at Vocational High Schools in Surakarta.
H2 : There is an effect of scientific publication towards teachers' performance at Vocational High Schools in Surakarta.
H3 : There is an effect of innovative work towards teachers' performance at Vocational High Schools in Surakarta.

RESULTS

Data Description

Description of Teachers' Performance Data

Data on teachers' performance variable were obtained by distributing questionnaires to 158 teachers. The results showed the lowest score of 8, the highest score of 16, an average of 13.13 and a standard deviation of 2.048. Questionnaire of teachers' performance variable consists of 4 questions whose measurements are assessed by alternative answers with a score of 1-4. If it is calculated by the percentage, the obtained highest score is 4x4x158 = 2528. The number of scores of the results of data collection of teachers' performance variable is 2075. Thus, the percentage of teachers' performance variable is (2075: 2528) x 100% = 82.08%. The frequency distribution of the score obtained from the teacher's performance can be seen in the Figure 2.
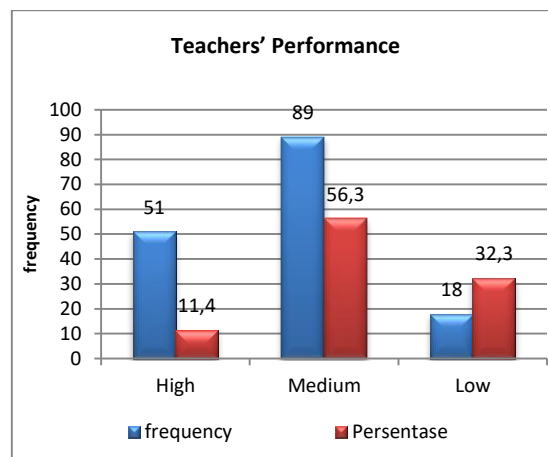
Figure 2. Teacher' Performance Trends Categories

Description of Self-Development Data

Self-development variable data was obtained by distributing questionnaires to 158 teachers. The results showed that the lowest score was 3, the highest score was 12, the average was 5.91 and a standard deviation of 2.116. The self-development variable questionnaire consists of 3 questions whose measurements are assessed with alternative answers ranging 1-4. If it is calculated by percentage, the obtained highest score is 3x4x158 = 1896. The number of scores of the results of data collection of self-development variable is 934. Thus, the percentage of self-development variable is (934 : 1896) x 100% = 49.26%. The frequency distribution of the score obtained from the self-development can be seen in the Figure 3.
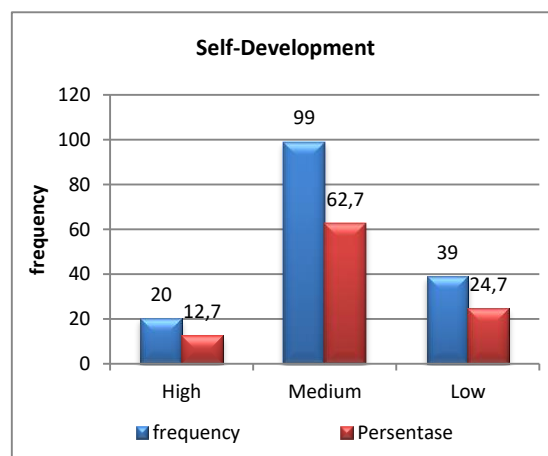
Figure 3. Self-Development Trends Categories

Description of Scientific Publication Data

Scientific publication variable data was obtained by distributing questionnaires to 158 teachers. The results showed that the lowest score was 3, the highest score was 12, the average was 5.36 and a standard deviation of 2.664. The Scientific publication variable questionnaire consists of 3 questions whose measurements are assessed with alternative answers ranging 1-4. If it is calculated by percentage, the obtained highest score is 3x4x158 = 1896. The number of scores of the results of data collection of scientific publica-tion variable is 847. Thus, the percentage of scientific publication variable is (847 : 1896) x 100% = 44.67%. The frequency distribution of the score obtained from the scientific publication can be seen in the Figure 4.
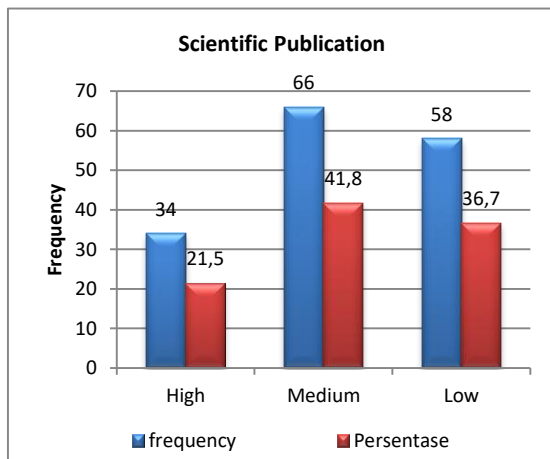
Figure 4. Scientific Publication Trend Category

Description of Innovative Work Data

Data of innovative work variable was obtained by distributing questionnaires to 158 teachers. The results showed that the lowest score was 3, the highest score was 12, the average was 5.86 and a standard deviation of 2.314. The innovative work variable questionnaire consists of 3 questions whose measurements are assessed with alternative answers ranging 1-4. If it is calculated by the percentage, the obtained highest score is 3x4x158 = 1896. The number of scores of the results of data collection of innovative work variable is 926. Thus, the percentage of innovative work variable is (926 : 1896) x 100% = 48.84%. The frequency distribution of the score obtained from the innovative work can be seen in the Figure 5.
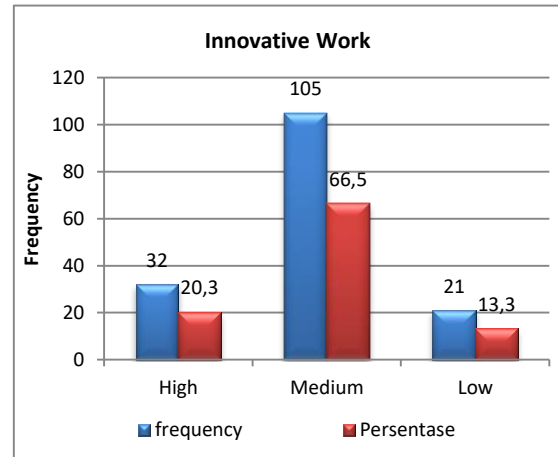
Figure 5. Innovative Work Trends Categories

Outer Model Evaluation

Convergent Validity

Test parameter of convergent validity in the PLS measurement model with reflexive indicator can be measured based on loading factor with rule of thumb > 0.7. The loading factor value with rule of thumb between 0.5 - 0.6 can still be used (Yamin & Kurniawan, 2011, p. 202; Haryono, 2017, p. 405) or using AVE and Communality > 0.5 parameters or T Statistics ≥ 1.96 and P Value ≤ 0.05. The results of the correlation between indicators and their constructs are shown in the Table 2.

This research is a confirmatory research. Therefore, convergent validity has a provision that the value of loading factor is more than 0.7 (Ghozali, 2014). Based on the table above, it is explained that all questionnaires of the research variables are valid. This is based on all questionnaire items of research variables namely self-development, scientific publication, innovative work, and teachers' performance showing that the value of loading factor is more than 0.7. It means that the T-Statistics value is ≥ 1.96.

Table 2.   Convergent Validity

	Original Sample	Sample Mean	Standard Deviation	T Statistics
KG1 <- Teachers' Performance	0.705	0.692	0.070	10.071
KG2 <- Teachers' Performance	0.785	0.772	0.084	9.326
KG3 <- Teachers' Performance	0.772	0.756	0.089	8.683
KG4 <- Teachers' Performance	0.840	0.841	0.043	19.444
PD1 <- Self-Development	0.851	0.848	0.031	27.366
PD2 <- Self-Development	0.811	0.807	0.039	20.653
PD3 <- Self-Development	0.773	0.764	0.075	10.284
PI1 <- Scientific Publication	0.800	0.725	0.273	2.931
PI2 <- Scientific Publication	0.953	0.861	0.352	2.708
PI3 <- Scientific Publication	0.799	0.723	0.298	2.686
KI1 <- Innovative Work	0.730	0.692	0.153	4.757
KI2 <- Innovative Work	0.909	0.892	0.097	9.343
KI3 <- Innovative Work	0.792	0.682	0.121	5.705

Discriminant Validity

Discriminant validity explains the ability of each indicator to make a distinction between its constructs and other constructs. If an indicator is incorporated into another construct, the indicator has good discriminant. From the table of cross loading, the overall construct of the constructor is stated to have good discriminant. It means that each construct has the highest relationship with its own variable. There is no greater specific indicator that is not from the same variable (Ghozali, 2011, p.25). Output of discriminant validity from the results of the data processing can be seen in the following Table 3.

Table 3.   Discriminant Validity

	Teachers' Performance	Self-Development	Scientific Publication	Innovative Work
KG1	0.705	0.186	0.103	0.224
KG2	0.785	0.212	0.059	0.087
KG3	0.772	0.195	0.007	0.115
KG4	0.840	0.463	0.223	0.351
PD1	0.379	0.851	0.220	0.316
PD2	0.320	0.811	0.511	0.541
PD3	0.221	0.773	0.369	0.441
PI1	0.030	0.247	0.800	0.718
PI2	0.187	0.453	0.953	0.749
PI3	0.096	0.310	0.799	0.633
KI1	0.099	0.426	0.667	0.730
KI2	0.322	0.381	0.648	0.909
KI3	0.174	0.500	0.587	0.792

Based on the table above, the result of cross loading showed that the latent construct correlation in predicting indicators in each variable was much better than other variable indicators. Thus, the test of discriminant validity has been fulfilled. Then, it can examine the comparison of the root value of AVE and the latent variable correlation coefficient with the correlation between constructs.

Average Variance Extracted (AVE)

AVE describes the average variance or extracted discriminant in each indicator so that the ability of each item in dividing measurements with others can be known. AVE value that is equal to or above 0.50 indicates a good convergent.

Table 4.   Average Variance Extracted (AVE)

	AVE	Root of AVE
Teachers' Performance	0.604	0.777
Self-Development	0.660	0.812
Scientific Publication	0.729	0.854
Innovative Work	0.613	0.783

Based on the Table 4, the result showed that the root value of AVE was greater than the AVE value. AVE value of the teachers' performance variable is 0.604. AVE value of self-development variable is 0.660. AVE value of scientific publication variable is 0.729. AVE

value of innovative work variable is 0.613. At the critical limit of 0.5, the indicators in each construct are valid with the other items in one measurement. It means that discriminant validity has been fulfilled.

Composite Reliability

Composite reliability measures internal consistency and its value must be above 0.6 (Ghozali, 2011, p. 27). The results of composite reliability can be seen in Table 5.

Table 5.   Composite Reliability

	Cronbach's Alpha	Composite Reliability
Teachers' Development	0.802	0.859
Self-Development	0.749	0.853
Scientific Publication	0.837	0.889
Innovative Work	0.714	0.889

Based on the Table 5, it can be explained that the value of composite reliability is good for the construct of self-development, scientific publication, innovative work, and teachers' performance. All of their values are above 0.60. Thus, it can be concluded that the construct has good reliability.

Inner Model Evaluation (Structural Model Evaluation)

The evaluation of the structural model was analyzed by looking at the significance of the relationship between the constructs shown by t-statistics.

Hypothesis Testing

Testing the hypothesis to answer the research hypothesis can be seen in t-statistics in the following Table 6.

Based on the Table 6, it can be explained as follows:

Fisrt, Self-development has a positive and significant effect on teachers' performance.

Based on the results of testing the Original Sample value of 0.333 and the T-statistics value of 5.028 which means greater than 1.96, the hypothesis stating that self-development has a positive and significant effect on teachers' performance can be acceptable.

Second, Scientific publication has a positive and significant effect on teachers' performance. Based on the results of testing the Original Sample value of 0.225 and the T-statistics value of 1.763 which means smaller than 1.96, the hypothesis stating that scientific publication has a positive but not significant effect on teachers' performance can be unacceptable.

Third, Innovative work has a positive and significant effect on teachers' performance. Based on the results of testing the Original Sample value of 0.282 and the T-statistics value of 1.810 which means smaller than 1.96, the hypothesis stating that innovative work has a positive but not significant effect on teachers' performance can be unacceptable.

Determination Coefficient (R^2)

The structural model is evaluated by looking at the value of determination coefficient (R^2) for each endogenous latent variable as the predictive power of the structural model. R Square in this study amounted to 0.184 and R Square Adjusted 0.168. Based on this shows that the value of R Square for teacher performance variables of 0.184 or 18.4% can be explained by self-development, scientific publications and innovative works, where the remainder is influenced by other variables not examined in this study. The value of R Square or determination coefficient for endogenous construct in this research is 0.184. It showed that the effect of self-development, scientific publication, and innovative work towards teachers' performance was weak.

Table 6.   Inter-Construction

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Self-Development -> Teachers' Performance	0.333	0.342	0.066	5.028	0.000
Scientific Publication -> Teachers' Performance	0.225	0.176	0.128	1.763	0.079
Innovative Work -> Teachers' Performance	0.282	0.281	0.137	1.810	0.058

Discussion

Effect of Self-Development towards Teachers' performance

Based on spread questionnaires, the level of achievement of self-development from the results of data collection is 49.26%. This number has not reached the maximum score and can still be increased. Teachers have not been maximal in joining the functional training activities. They rarely became speakers at education seminars. They were also less active in teachers' subject discussion activities. On the other hand, the results of the data testing showed that the original sample value of the self-development variable is 0.333. It showed that self-development had a positive effect on teachers' performance. When self-development increases, it will improve teachers' performance as well. The t-statistics value of $5,028 \geq 1.96$ means that self-development was significant with teachers' performance. Based on the original sample value and the t-statistics value, it showed that self-development had a positive and significant effect towards teachers' performance.

Based on the results of interviews with vocational high school teachers related to self-development, it showed that they often attended seminars, workshops, and MGMP activities because of orders from the principal and aims of increasing their performance credit figures. Teachers often took part in training and education because there were demands to attend a minimum of 32 training courses. They also still actively attended teachers' subject discussion routine activities. The results of Maksum's study (2015, p. 76) showed that the results of self-development activities were carried out for some certain teachers, thus not all of teachers.

The same thing was also done by Danim's research (2011, p. 95) showing that the quality of teachers in self-development activities was still low. Teachers were less active in training activities, educational seminar activities, workshops, and MGMP activities. In conclusion, self-development carried out by vocational high school teachers in Surakarta will be able to improve teachers' performance. The results of a study conducted by Althauser (2015, p. 111) supporting this study explain that a Continuing professional development program can improve the self-development of a teacher. Continuing self-development to improve teacher performance in accordance with the objectives of Continuing professional development.

Effect of Scientific Publication towards Teachers' performance

Based on spread questionnaires, the level of achievement of self-development from the results of data collection is 44.67%. This number has not reached the maximum score and can still be increased. Teachers rarely wrote scientific papers. There were still many teachers who have never done scientific or research publications. Teachers also rarely published textbooks or enrichment books. On the other hand, the results of the data testing showed that the original sample value of 0.225 indicated that scientific publication had a positive effect towards teachers' performance. When scientific publication increases, it will improve teachers' performance as well. The t-statistics value of $1.763 \leq 1.96$ means that scientific publication was not significant with teachers' performance. Based on the original sample value and the t-statistics value, it showed that scientific publication had a positive but not significant effect towards teachers' performance.

Based on the interviews conducted by the researcher, it showed that teachers rarely did scientific publications or even publication of textbooks. This is in line with the research conducted by Alifa & Rosidah (2017, p. 62). The results of the research indicated that the activities of teachers in conducting scientific publications were still low. Teachers were less active in scientific forums, did less research, and did less scientific publication or research. In conclusion, scientific publication had a positive effect towards teachers' performance. This means that the existing scientific publication will improve the intention of the teachers' performance, but it is still quite low because it is not significant. Those results indicated that teachers' expectation on teachers' performance were higher than scientific publication conducted by vocational high school teachers in Surakarta.

Widodo, Supardi, Suyoto, & Wismanto's research (2014, p. 105) said that the teachers had less understanding towards concept and principal written of a classroom action research study which will be published in a form of scientific journal, not all of teachers did

reflecting-thinking through portfolio (a record of teachers' work by time to time), there were no counselors to help them in writing an article of a classroom action research results. Wuryandini (2014, p. 117) said that there were still many problems faced by teachers related to scientific publications, they are teachers had different characteristics (individuals and environment), a scientific publication event which involved a presentation of the scientific research results, textbooks and teachers' book publication was not done effectively in a scientific forum, the teachers got a partial understanding about scientific publication, the teachers' preparation and commitment to join workshop were still less.

Effect of Innovative Work towards Teachers' performance

Based on spread questionnaires, the level of achievement of self-development from the results of data collection is 48.84%. This number has not reached the maximum score and can still be increased. Teachers rarely innovated in finding appropriate technology for the learning materials. They rarely modified or created teaching aids. They also rarely modified learning methods. Besides, they were less active in developing compilation of learning process standards and assessments and in compiling grid of examination questions. On the other hand, the results of the data testing showed that the original sample value of 0.282 indicated that innovative work had a positive effect on teachers' performance. When innovative work increases, it will improve teachers' performance as well. T-statistics value of 1.810 ≤ 1.96 means that innovative work was insignificant with teachers' performance. Based on the original sample value and the t-statistics value, innovative work had a positive but not significant effect on teachers' performance. Based on the interviews, the researcher indicated that vocational high school teachers were still lacking in developing the capabilities of their innovative work. Teachers preferred simple and available learning media. The reason was that they already had crowded teaching burden. It did not allow them to create innovative learning media.

This is reinforced by a research conducted by Sujianto (2013, p. 160). The result of the research showed that teachers were still lacking in finding or creating appropriate technology.

It was caused by some factors. Teachers preferred available learning media. They were not ready to develop teaching materials either. Besides, they had limited abilities and unsupportive facilities and infrastructure. In conclusion, innovative work had a positive effect towards teachers' performance. This means that the existing innovative work will improve the intention of the teacher's performance, but it is still quite low because it is not significant. Those results indicated that teachers' expectation on teachers' performance were higher than innovative work carried out by vocational high school teachers in Surakarta. The results of this study stated that teachers' ability to write a scientific journal is still low. In contrary Dudung, Priyanto, & Lubi (2014, p. 21) explained that teachers were able to do self-development in writing a scientific journal as preparation to get a higher level of their career. Yani (2011, p. 217) in her dissertation said that the teachers' ability in writing an innovative scientific work by involving technology was still low. It was caused that the media and tools offered were still limited. The school offered around 25% - 50% tools and media. It means that the schools were not able to provide facilities to train its teachers. It can be seen from tools and media. They provided conventional method only such as globe, maps, pictures, and LKS.

CONCLUSION

Based on the original sample value and the t-statistics value, it showed that self-development had a positive and significant effect towards teachers' performance. It can be concluded that self-development carried out by vocational high school teachers in Surakarta will improve teachers' performance.

Based on the original sample value and t-statistics value, it showed that scientific publication had a positive but not significant effect towards teachers' performance. It can be concluded that scientific publication had a positive effect towards teachers' performance. This means that the existing scientific publication will improve the intention of the teacher's performance, but it is still quite low because it is not significant. Those results indicated that teachers' expectation on teachers' performance were higher than scientific publication conducted by vocational high school teachers in Surakarta.

Based on the original sample value and the t-statistics value, it showed that innovative work had a positive but not significant effect towards teachers' performance. It can be concluded that the innovative work had a positive effect towards teachers' performance. This means that the existing innovative work will improve the intention of the teacher's performance, but it is still quite low because it is not significant. Those results indicated that teachers' expectation on teachers' performance were higher than innovative work carried out by vocational high school teachers in Surakarta.

Based on the results of this research, there are three suggestions to increase teachers' participation in Continuing professional development consisting of self-development, scientific publication, and innovative work: (1) Teachers utilize and look for training and education opportunities, often attend education seminars and workshops related to their fields, and are more active in MGMP activities; (2) Teachers are expected to be more active in scientific forums, actively conduct scientific publications or research results; (3) Teachers utilize programs that can enhance their professionalism by producing innovative works.

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EVALUATION OF BEAUTY TRAINING PROGRAMS
IN REGIONAL WORK TRAINING CENTER OF EAST JAKARTA
USING THE GOAL FREE EVALUATION MODEL

Nely Suroyya Martalena
Universitas Negeri Jakarta

Dwi Atmanto
Universitas Negeri Jakarta

Jenny Sista Siregar
Universitas Negeri Jakarta

Abstract

This study aims to determine the impact of the beauty training program in PPKD of East Jakarta on students. The impact can be seen based on three criteria, namely positive impacts according to program objectives, positive impacts outside the program objectives (side effects), and negative impacts outside the program objectives. The research method used in this study is an evaluative study using the Goal Free Evaluation model. The research subjects consisted of: managers, instructors, and beauty training participants in PPKD of East Jakarta . Data was collected using observation, interviews, and documentation. The results showed that (1) the positive impact according to the program objectives was felt by almost all training participants, namely they could increase their knowledge and skills in the field of beauty and were ready to enter the workforce, (2) a positive impact outside the program objectives freelance work as a makeup artist, having confidence in work, and daring to open a business in the field of beauty, and (3) negative impacts outside the program's objectives felt by a small number of training participants who were less serious and less focused on training that they could not accept the material taught so that they are not ready to enter the workforce.

Keywords: *program evaluation, beauty training, goal free evaluation*

Contact   Nely Suroyya Martalena   ✉ nelysuroyya@gmail.com

🖃 Universitas Negeri Jakarta, Jl. Rawamangun Muka,
RT.11/RW.14, Rawamangun, Pulo Gadung, Kota Jakarta
Timur, Daerah Khusus Ibukota Jakarta 13220, Indonesia

INTRODUCTION

Jakarta as the capital city of the country has a dense population. According to the DKI Jakarta Central Statistics Agency (*Badan Pusat Statistik*/BPS), DKI Jakarta residents in 2017 were 10,177,924 people with an area of around 661.52 km². The denseness of the population in Jakarta has made it increasingly fierce competition to get jobs with the quality of human resources (HR) needed even higher. If people cannot compete with the quality of their human resources, unemployment will occur.

Based on data obtained from DKI Jakarta Central Statistics Agency, the Open Unemployment Rate (TPT) in 2017 was 293 thousand people or 5.36 percent. That number decreased from 2016 amounting to 306 thousand people or 5.77 percent. When detailed according to districts / cities, the highest TPT is in East Jakarta at 9.13 percent. Then followed by North Jakarta and Central Jakarta at 7.31 percent and 6.51 percent.

Therefore, it is necessary to develop human resources as an effort to eliminate the gap between the capabilities possessed by the workforce and the desired work targets. The role of government is needed as an agent of development in overcoming social problems regarding human resources. According to Suyono (2014, p. 48), "The development of its essence is planned change towards a better way to improve the quality of life and human well-being". Therefore, the development or improvement of the quality of human resources is a very important form of development. The development or improvement of the quality of human resources can be done through the learning process in education and training activities. The learning process in education and training can change human behavior towards a better direction towards improving quality and welfare.

One of the Training Institutions established by the government as a development agent to develop the human resources needed by the work industry is the Regional Work Training Center (*Pusat Pelatihan Kerja Daerah*/PPKD) of East Jakarta. PPKD is a Regional Integrated Service Unit (*Unit Pelayanan terpadu Daerah/*UPTD) under the responsibility of *Dinas Tenaga Kerja dan Transmigrasi* (Disnakertrans) led by a Chief who is responsible to the Head of the Manpower Office.

PPKD has the task of conducting job training carried out both in institutional and outside training around the region and employment in the small and medium business industry. The work training program implemented is one of the government's efforts through the Manpower and Transmigration Office to address labor issues, ranging from the increase in the workforce, unemployment, employment, increasing mobility of the productive age population, to the low quality of the workforce.

Based on data obtained from the DKI Jakarta Central Statistics Agency, the DKI Jakarta Open Unemployment Rate (TPT) in February 2018 was 5.34 percent. The work force in February 2018 was reduced by 0.60 percent compared to February 2017. The highest TPT was in East Jakarta at 9.13%. Then followed by North Jakarta and Central Jakarta at 7.31 percent and 6.51%.

PPKD was built to overcome labor problems by developing human resources through training in various vocational fields that could be chosen according to the interests of the job seeker community. That way, it is hoped that it can attract many job seekers to become trainees. According to Ivan Hanavi "Vocational education and training in essence is a place to prepare a knowledgeable, skilled, and personable workforce to meet the expectations of the world of work and industry" (Hanafi, 2012).

PPKD of East Jakarta has fifteen vocational fields, one of which is the field of Beauty. The training program in PPKD of East Jakarta has 4 classes each year. In 2018, class I starts on February 26 - April 28, 2018, class II starts on April 30 - June 18, 2018, class III starts on July 23 - September 22, 2018, class IV starts on September 24 - November 28 2018. Beauty training is included in the new department program that was formed in 2013. Until 2018, PPKD of East Jakarta has graduated 380 Beauty training participants.

Seeing the development of an increasingly developing work world, this field of beauty is in great demand by women in general, because the field of beauty business is needed to support the appearance of modern women and can be used as a livelihood. However, the existing human resources in DKI Jakarta have not been fully fulfilled to work in the field of beauty. This is in accordance with the statement of one of the 4th generation students in 2018 who stated that she was interested in participating in

the Beauty training in PPKD of East Jakarta because the field of beauty is currently developing and becoming a trend especially to become an artist makeup in the Capital City. By participating in this Beauty training, he hopes to be able to increase his knowledge and skills in the field of beauty so that he can compete as a competent makeup artist.

The existence of this beauty training is expected to be an instrument of human resource development that can transfer knowledge, skills and productive work ethics. The majority of students who take part in this beauty training program are young women who have just graduated from high school and housewives who are looking for provisions to enter the workforce in the field of beauty.

The existence of beauty training in PPKD East Jakarta which runs according to Governor Regulation No. 33 of 2015 concerning the Formation, Organization and Work Procedure of PPKD of East Jakarta (Gubernur Daeraha Khusus Ibu Kota Jakarta, 2015) is expected to be the right solution for job seekers (unemployed), especially young women and housewives who do not have human resources that are in accordance with the needs of the workforce and have difficulty finding work. The community that participates in the Beauty training program in PPKD is taught to include the ability of theory and practice in accordance with the demands of work, so that they can empower themselves.

The training program as one of the HR development strategies requires an evaluation function to determine the effectiveness of the training program in question. Evaluations that are often understood in the world of education and training are limited to assessment. The assessment to find out the mastery of the training material was done formatively and summatively. When an assessment has been made, it is considered that the evaluation has been done. Such understanding is not too precise. The implementation of the assessment tends to only see the achievements of the learning objectives. In fact, the educational process is not only the value seen, but there are many factors that make a program successful or not. Assessment is only a small part of the evaluation. Evaluation must also be understood as part of supervision. Evaluation does not only deal with values measured based on solving problems, but evaluation of education and training pro-

grams will examine many factors. Program evaluation can be concluded as a process of information seeking, information discovery and information determination that is presented systematically about planning, values, goals, benefits, effectiveness and suitability of something with the criteria and objectives that have been set.

The evaluation model that will be used in this study is the goal free evaluation (GFE) model to determine the extent of the impact of the beauty training program in PPKD on students. This GFE model focuses on behavioral changes that occur as a result of the program being implemented, seeing side effects both expected and unexpected, and comparing with before the program is carried out.

Program evaluation is very much a model, according to the purpose of the study, the goal free evaluation (GFE) model developed by Scriven (1991) is used, which is interpreted as a reality-based evaluation or independent evaluation (Youker, Ingraham, & Bayer, 2014). Furthermore, Scriven provides a more detailed description that in the GFE model, goals are made as an important starting point for evaluations, meaning that objectives do not have to be taken but examined and evaluated (Scriven, 1991). GFE models are also often referred to as effects model evaluations or effects models, which involve a wider scope. Stufflebeam and Coryn also explain that GFE is an innovative approach that is oriented towards consumers of evaluated programs (Stufflebeam & Coryn, 2015).

In the GFE model the goal is to be an important starting point for evaluating, meaning that the objectives do not have to be taken but examined and evaluated. The GFE model focuses on the actual results of an activity program, not only recording the goals set, this model is able to identify the results of records that cannot be identified by the program designer. Through a blatant or hidden process the GFE model seeks to collect data in order to form program descriptions and identify accurate processes. Furthermore, Scriven provides a more detailed description that in the GFE model, the goal is to be an important starting place for evaluating, meaning that the goal does not have to be taken but is examined and evaluated (Scriven, 1991). The model can be seen in the Figure 1.
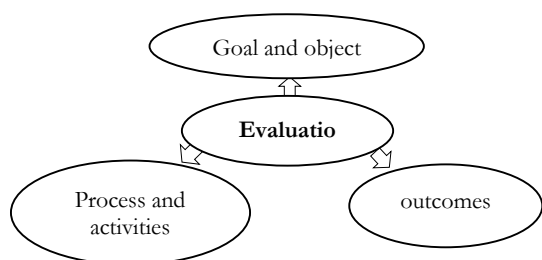
Figure 1. Adaptation from Scriven Goal Free Evaluation Model (1972)

Based on the above picture and the previous explanation it can be concluded that the use of the GFE model in this study is because this evaluation model pays attention to the impact of the program both positive and negative impacts and other side effects. The intended impact is the impact experienced by consumers or program objects or program objectives, namely students, so that the object of research is focused on students.

From the implementation of the Beauty training program, the positive impact of the program will be known, namely the impact that arises from the program that is in accordance with the objectives, negative impacts, namely unwanted negative impacts and side effects that arise that are positive but outside the program objectives. Work procedures in carrying out data mining intentionally do not focus on objectives but the program objectives are used as a platform to find out the impact of the program.

Free evaluation of objectives used by researchers based on what is done by the program, in this case the results of the implementation of Beauty training are not what the program aims to be. Goal-free evaluations have the opportunity to adjust needs to the objectives. The problems to be investigated are the results of the Beauty training program. The implementation of the Beauty training program in PPKD of East Jakarta needs to be evaluated in order to obtain an overview and the benefits and shortcomings that exist in implementing the Beauty training program for students with the existence of the program.

This Goal Free Evaluation evaluation model has its advantages and disadvantages. The strengths of the goal-free model include: (a) the evaluator does not need to pay attention to the details of each component, but only emphasizes how to reduce bias. (b) this model considers users as the main audience. Through

this model, Scriven wants evaluators to measure the impressions obtained from a program compared to user needs and not compare them with advocates. (c) The influence of the concept on the community, that without knowing the purpose of the activity that has been carried out, an assessor can conduct an evaluation. (d) Another advantage, with the emergence of the free model of objectives proposed by Scriven, is to encourage consideration of any possible effects not only planned, but also other side effects that arise from the product.

However, what is proposed by scriven also turns out to have weaknesses as follows: (a) The free model of this goal is generally free to answer important questions, such as what effects have been taken into account in an event and how to identify those influences. (b) Even though good free-purpose ideas for assisting activities parallel to evaluation on the basis of honesty, at a practical level scriven is not very successful in describing how evaluation should actually be carried out. (c) Not recommending how to produce a needs assessment even if it ultimately leads to needs assessment. (d) Required evaluators who are truly competent to be able to carry out this model evaluation. (e) The systematic steps that must be taken in the evaluation only emphasize the target object. Goal Free Evaluation is a program evaluation point, where the object being evaluated does not need to be related to the object or subject's purpose, but directly to the implications of the existence of the program whether or not the object is based on an assessment of existing needs.

Written data obtained by researchers from PPKD of East Jakarta about graduates is that not all graduates are known for their work. Even though there are graduates monitoring and marketing. And the influence or impact of training participants after attending beauty training was not evaluated by PPKD of East Jakarta. Therefore, an evaluation is needed to determine the impact of Beauty training conducted by PPKD of East Jakarta to assess and make improvements needed in Beauty training activities.

From the background above, there are a number of issues that need to be examined, including: (1) how is the implementation of a beauty training program viewed from the components of socialization, selection, training, certification, marketing and monitoring?, (2)

what are the results (results) from the implementation of the PPKD of East Jakarta beauty training program based on three criteria, namely positive impacts in accordance with the program objectives, positive impacts outside the program objectives (side effects), and negative impacts beyond the program objectives?

This study aims to obtain information about the implementation of the PPKD of East Jakarta beauty training program and its impact on training participants seen based on three criteria, namely (1) positive impacts according to program objectives, (2) positive impacts outside the program objectives (side effects), and (3) negative impacts outside the objectives program evaluation using the Target Free Evaluation model.

The benefits of this research are that decision makers and interested parties can obtain information about the effectiveness of the PPKD of East Jakarta beauty training program in terms of socialization, registration, selection, training, certification, marketing, and monitoring components so that later can make improvements or improvements to the implementation beauty training program in PPKD of East Jakarta based on several recommendations that have been given.

There are several results of the research behind this research, one of which is research about the use of the Goal Free Evaluation model in evaluating superior school programs SMAN 2 Sangatta Utara with the acquisition of research results that are positive impacts and side effects greater than the negative impact, indicating that the program has succeeded but the negative impacts that arise still must be considered and corrected so as not to disturb the stability of the program that has been good (Rubito, 2016). In addition to the research behind this research, there are also studies related to this research, one of which is research on efektivitas Program Pelatihan Kecakapan Hidup (*life skill*) bidang tata rias pengantin pada remaja putus sekolah di Lembaga Kursus dan Pelatihan (LKP) Kota Cimahi Provinsi Jawa Barat (Ramadhania, 2016). The research has similarities to those carried out by researchers in terms of the object under study, namely about training in cosmetology or beauty skills. The difference lies in the purpose of the research, where research conducted by Ramadhania (2016) aims to obtain descriptive re-sults/descriptions of the extent of the effectiveness of the training program, while the research conducted by researchers aims to determine the impact of the training program. Research on beauty or cosmetology training is rare because the field of beauty in the world of education is relatively new. Therefore there is a need for the role of students, students, lecturers, and re-searchers to conduct research in the field of beauty because of the growing age making the field of beauty increasingly influential in the world of education, development, economics, social and so on. From some of the problems expressed in the implementation of beauty training and the study of some of the results of previous research that are relevant and the background of this research, the researchers were interested in conducting research on evaluating the beauty training program in PPKD of East Jakarta using the Goal Free Evaluation model.

RESEARCH METHOD

This research is a study that uses a qualitative approach, because in the implementation of this evaluation will look for deep and extensive information to get a comprehensive picture of an object being evaluated. The object evaluated was the PPKD of East Jakarta beauty training program in terms of the components of socialization, selection, training, certification, marketing and monitoring.

The research method used in this research is evaluative/evaluation studies, because they want to evaluate a program / activity in one particular unit, in this case is beauty training conducted in PPKD East Jakarta. The research design used in this study is the Goal Free Evaluation evaluation model. The research period is conducted for 10 months from February to November 2018. Subjects involved in this study consisted of: 2 managers, 3 instructors, and 15 beauty training participants in PPKD of East Jakarta .

The method of data collection is done by observation, interviews, and documentation. Data analysis on evaluation of the beauty training program in PPKD of East Jakarta was reviewed from the components of socialization, registration, selection, training, certification, marketing, and monitoring. The data analysis technique used is qualitative descriptive data analysis of Miles & Huberman's (1994) models which can be described as follows:
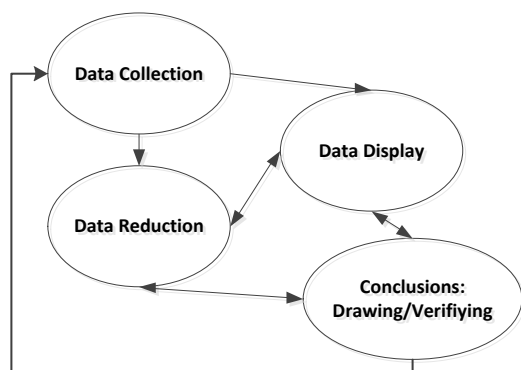
Figure 2.   Qualitative descriptive data analysis
model of Miles dan Huberman
(Miles & Huberman, 1994)

The validity of the data uses data triangulation. In order for the results of the study to be really good, the collected data must have conditions, namely credibility. Strategies to increase data credibility include extension of observation, persistence of research, triangulation, analysis of negative cases and member checking.

RESEARCH RESULTS & DISCUSSION

Based on the evaluation study of the beauty training program in PPKD of East Jakarta using the Goal Free Evaluation model, there are several things that have been evaluated including the socialization component, including: evaluation of the media used to disseminate information about beauty training in PPKD of East Jakarta and evaluation of socialization activities to the community conducted by PPKD of East Jakarta to the community. Judging from the selection component, it includes: evaluating the suitability of the training participants' registration requirements in participating in the selection and evaluation of the selection flow that the trainee must pass. Judging from the components of the implementation program, including: evaluation of the readiness of facilities and infrastructure used in the implementation of training, and evaluation of the process of implementing beauty training in the classroom. Judging from the competency test or certification component, it includes: evaluation of the PPKD competency test and evaluation of BNSP competency tests. Judging from the marketing component, it includes: an evaluation of the industry that works with PPKD to market graduates of beauty training and

evaluation of graduates' jobs through PPKD of East Jakarta. Judging from the monitoring component, it includes: evaluation of the presence of communication media between graduates and PPKD and evaluation of job vacancy information provided by PPKD of East Jakarta. For more details about the components and aspects that have been evaluated in the implementation of the beauty training program in PPKD of East Jakarta can be seen in Figure 3.

In evaluating beauty training in PPKD of East Jakarta using the Goal Free Evaluation model, researchers collected data using the method of observation, interviews, and documentation. Through this method, then the results of the evaluation of each component of the beauty training program can be seen as seen in Table 1.

Based on the evaluation of the implementation of the beauty training program in PPKD of East Jakarta using Goal Free Evaluation, the results of the training participants were obtained after participating in beauty training. These impacts include:

Positive Impact According to Program Objectives

The purpose of this PPKD of East Jakarta beauty training program is to form human resources who are ready to enter the world of work in the field of beauty. Based on interviews with 15 trainees, the evaluation of the implementation of the beauty training program in PPKD of East Jakarta using Goal Free Evaluation, the results showed that almost all graduates who had a positive impact after beauty training were those from the socialization component they saw on the web, from the selection component, they fulfill the registration requirements and follow the selection path, from the implementation component they undergo good training without any obstacles, from the certification component to follow the PPKD competency test and BNSP competency test and pass. From the marketing component they get jobs from PPKD, from the monitoring component they continue to establish communication with PPKD and get job vacancies from whatsApp group. Therefore there were no obstacles faced by the training participants so that they had the expected positive impact from the goal of the beauty training program.
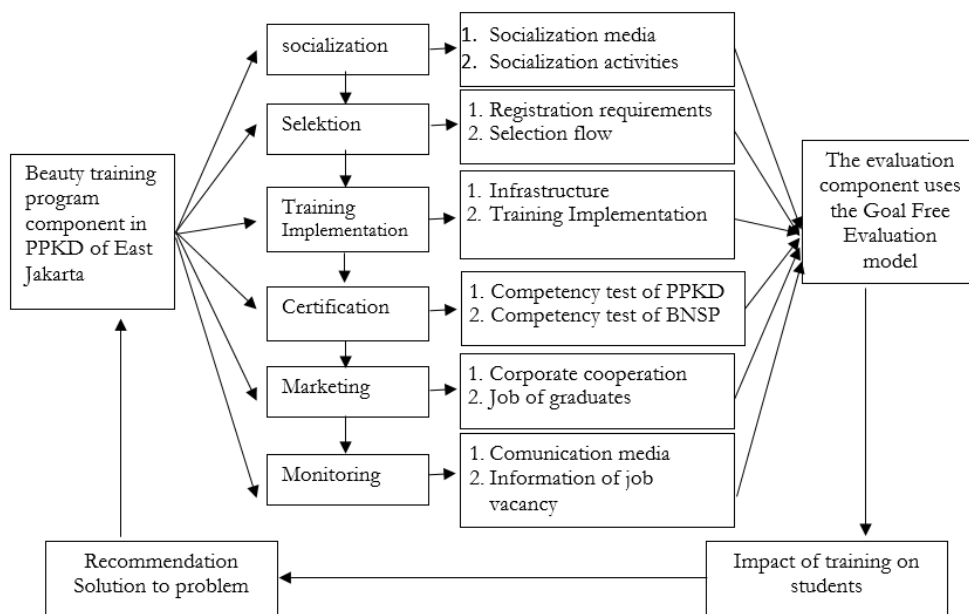
Figure 3. Evaluation of a beauty training component in PPKD of East Jakarta

Table 1. Evaluation Results of Beauty Training Components in PPKD of East Jakarta

No	Component	Aspek	Kriteria evaluasi	Hasil evaluasi
1	Sosialisation	−Media sosialisasi −Kegiatan sosialisasi	There is appropriate media and there are socialization activities carried out by PPKD	PPKD promotes training through the web and brochures PPKD conducts socialization to certain areas in the kelurahan
2	Selektion	−Syarat pendaftaran −Alur seleksi	Students fulfill the registration requirements and follow the selection path according to the procedure	There are some students who do not meet the registration requirements and do not follow the selection path
3	Training Implementation	−Infrastructure −Training Implementation	There are facilities that support the training and training process to run well	The infrastructure provided is damaged and the training process is a bit constrained
4	Sertifikasi	−Competency test of PPKD −Competency test of BNSP	Students can pass the competency tests of PPKD and BNSP	All students take the competency test of PPKD and BNSP and they can graduate
5	Marketing	−Corporate cooperation −Job of graduates	PPKD cooperates with the work industry to market graduates and graduates to get jobs	PPKD has no permanent cooperation with the beauty industry so that most graduates get their own jobs
6	Monitoring	−Comunication media −Information of job vacancy	There is a communication medium that maintains communication links between graduates and the PPKD and PPKD informs each job opening to graduates	There are whatsApp groups that can establish communication links between graduates and PPKD parties and if there are job information that is informed through the WhatsApp group

Positive Impact Outside the Program Objectives (Side Effects)

Based on interviews with 15 trainees, evaluating the implementation of the beauty training program in PPKD of East Jakarta using Goal Free Evaluation, the results showed that almost all graduates also had side effects after beauty training, namely those of all components fulfilling the evaluation criteria, but the difference in The implementation component obtained data that they were more enthusiastic and earnest so that the knowledge and skills obtained were in accordance with what they wanted and the marketing component obtained data that they were not only dependent on the promotion of jobs provided by PPKD, but they were able to get jobs, most of these informants received freelance as makeup artists (MuA), had confidence in work and some established businesses in the beauty sector such as salons and makeup studios.

Negative Impact Outside the Program Objectives

Based on interviews with 15 trainees, evaluating the implementation of the beauty training program in PPKD of East Jakarta using Goal Free Evaluation, the results showed that only a few of the graduates had a negative impact after beauty training, namely those from the socialization component they got from friends or acquaintances. from the selection component they did not meet the registration requirements and followed the selection flow because the reason for meeting the quota of prospective training participants was immediately passed, from the implementation component they were trained in earnest so that the knowledge and skills taught could not be well received, from the certification component PPKD competency test and BNSP competency test and pass but cannot use the certificate properly, from the marketing component they do not get a job from PPKD because it is inconclusive to be promoted, and from the monitoring component they do not in communication with PPKD and get job info from whatsApp group but ignore it. Therefore, the training participants could not develop their potential or human resources to enter the world of work in the field of beauty so that they did not get jobs.

CONCLUSION

The results of this study shows that, in general, that the implementation of the beauty training program in PPKD of East Jakarta has been going well but there are still shortcomings, including: (1) in the socialization component, the PPKD has promoted beauty training through websites and brochures, as well as socializing beauty training in existing villages in East Jakarta, (2) the selection component showed that the registration requirements and selection path of the training participants were not all according to the procedures that were supposed to, (3) in the training implementation component the results provided were damaged and the training process was limited, (4) the certification component obtained results that all students take the PPKD competency test and BNSP can pass, (5) in the marketing component the results show that there is no permanent collaboration with the beauty industry so that most graduates get their own jobs, and (6) the monitoring component has il that there are WhatsApp groups that can establish communication links between graduates and PPKD parties and if there are job information that is informed through the WhatsApp group.

Although in general it is said that the PPKD of East Jakarta beauty training program has been going well, there have been impacts on the training participants after attending beauty training. These impacts include: (1) the positive impact according to the program objectives is felt by almost all training participants, namely they can increase knowledge and skills in the field of beauty so that they are ready to enter the workforce, (2) a positive impact outside the program objectives freelance work as a makeup artist, having self-confidence in work, having confidence in work, and daring to open a business in the field of beauty, (3) negative impacts outside the program's objectives were felt by a small number of participants who were less serious and focused on training ie they did not can receive the material taught so it is not ready to enter the workforce.

Based on the results of the evaluation of training components and the impact of the training participants after participating in beauty training at PPKD of East Jakarta , there were several recommendations that researchers

could provide to improve the implementation of beauty training and there were no negative impacts felt by trainees, including: (1) Recommendations on the socialization component should be more active in promoting training through print media such as newspapers and magazines and through social social media such as Facebook, Instagram, Twitter and other social media that are widely used by the public. (2) Recommendations on the selection component should the PPKD tighten the qualifications of the registration requirements and really require that prospective procedure participants who should have. (3) Recommendations on the implementation component of the training should provide the infrastructure that is complete and still functioning properly so that the training process can run smoothly. (4) Recommendations on the certification component are only input so that the certificate should be out faster and the validity period is longer. (5) Recommendations on the marketing component should PPKD establish more cooperation with the beauty industry so that graduates can find jobs more easily through PPKD. (6) Recommendations on the monitoring component are only a little input so that the PPKD is more active in giving job information to graduates through the whatsApp group created.

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NEED OF VOCATIONAL HIGH SCHOOL BASED ON LOCAL POTENTIAL FOR REGIONAL DEVELOPMENT IN CILACAP DISTRICT

Widi Lesmana
Universitas Negeri Yogyakarta

Pardjono
Universitas Negeri Yogyakarta

Abstract

This study intends to: (1) describe regional development programs, (2) determine local potential, (3) describe the level of alignment of the current spectrum of expertise and make a spectrum of expertise Vocational High Schools based local potential in the Cilacap District. Descriptive research was used in this study. The research site was carried out in the Cilacap Regency area. The data sources used are secondary data sources, namely the use of data through official documents such as the Rencana Tata Ruang Wilayah (RTRW), Rencana Pembangunan Jangka Menengah Daerah (RPJMD), Cilacap Regency in the 2017 Figures and the Cilacap Regency Economic Census in 2016. Analysis of official documents are used to achieve the research objectives. The validity of the documents carried out is the provision of a wet stamp from the related agency. The results of this study include: (1) the development program planned for the development of local potential in the Cilacap Regency area is listed on the 4th mission of regional development, namely "developing an economy that relies on local and regional potential"; (2) existing local potential includes the manufacturing sector; agriculture, forestry and fisheries; wholesale and retail trade, car and motorcycle repair; and the construction sector; (3) the level of alignment of the expertise spectrum of SMK with local potential in corridor 1 amounting to 35.7%; corridor 2 of 28.6%; corridor 3 is 43% while corridor 4 is 28.5%; areas of expertise that are in harmony with local potential include: Technology and Engineering; Agribusiness and Agrotechnology; Maritime; Business and management. The needs of local potential vocational schools are 36 schools, 465 classes and 887 teachers. It is necessary to close and increase the areas of expertise, expertise programs and expertise competencies to be in harmony with local potential in the Cilacap Regency and its surrounding areas.

Keywords: *vocational school based local potential, regional development, cilacap region*

Contact   Widi Lesmana

✉ widilesmana19.2017@student.uny.ac.id

🖥 Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Depok, Sleman 55281, Yogyakarta, Indonesia

INTRODUCTION

Economic inequality between regions is the background for why regional-based potential optimization is interesting to analyze. Cilacap Regency GRDP is ranked 2 as the biggest contributor to GDP in 2016 after Semarang, which is 9.22 percent. The economic potential of Cilacap Regency is mainly in the category of Manufacturing Industry. The role of the Manufacturing Industry category is 64.09 percent of the GRDP of Cilacap Regency, which is the largest in the Food and Beverage Industry subcategory. There are similarities in the potential of the region owned to the 24 sub-districts, because of the conditions of nature, culture, education and so forth. It is necessary to divide the development sub-region to facilitate the categorization of the potential of the area owned. The administrative map of the Cilacap Regency area can be seen in the following Figure 1.

Based on the Education and Culture Statistics Data Center, the number of vocational high school students in Cilacap Regency in 2017/2018 is 38,534. This amount is an accumulation of 65 existing schools. The potential of the workforce in the vocational secondary education sector in Cilacap Regency in 2017/2018 is 13,362 graduates who are ready to work according to their respective fields of expertise (Direktorat Pembinaan Sekolah Menengah Kejuruan, 2018). The number of graduates indicates that every year Cilacap has prospective skilled workers who are ready to work and advance the region. Clarke & Winch (2007, p. 9) says that vocational education is limited to preparing the population for life in the workforce. Whereas according to Gunderson (2004, p. 3), vocational education includes courses and programs at various levels of education for certain careers in the field of work. According to Billet (2011, p. 2), vocational education as "education for employment" namely the ability to carry out work that is in accordance with the field of expertise must be owned by students. Vocational education in an international context, often referred to as TVET (Technical and Vocational Education and Training). TVET is related to the acquisition of knowledge and skills for the world of work (Gough, 2010, p. 1). Vocational education involves the preparation of people for the world of work, that is, preparing them to "make a living" by the nearest and distant communities (Thomas, 2005, p. 626). In line with that, Rauner (2009, p. 1451) states that vocational education is different from all types of education institutionalized in schools and universities.
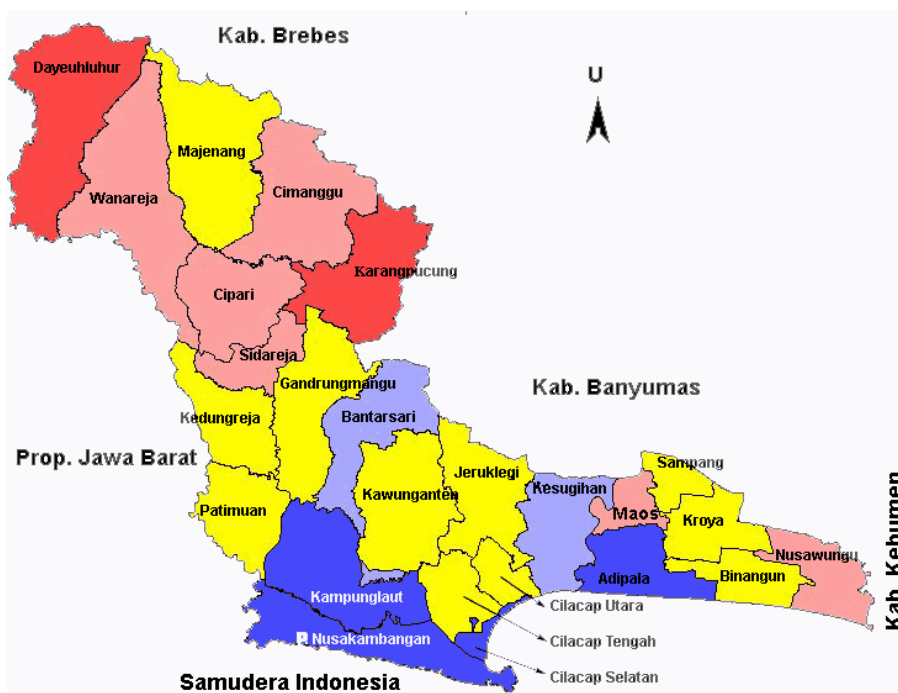

Figure 1.   Map of Cilacap Regency Area (Source: BPS Documents)

Understanding of the type of command or assignment of a work related to the development of knowledge in an education is called vocational education (Sudira, 2016, p. 9). Pavlova (2009) said the objectives of the tradition of vocational education include:

> *Traditionally, direct preparation for work was the main goal of vocational education. It was perceived as providing specific training that was reproductive and based on teachers'instruction, with the itention to develop understanding of a particular industry, comprising the specific skills or tricks of the trade. Students' motivation was seen to be engendered by the economic benefit to them, in the future. Competency-based training was chosen by most governments in western societis as a model for vocational education* (Pavlova, 2009, p. 7).

The main purpose of vocational education if viewed traditionally is the direct preparation of prospective workers to work. In line with Pavlova (2009) & Rojewski (2009) says the tradition of vocational education prepares skilled workers with high abilities that are subject to employers. But the open unemployment rate of vocational school graduates is actually very high compared to other education levels. This condition is caused by a mismatch of fields of expertise possessed by the needs of the workforce, and graduates without skills who can face a disruptive era. Renewing the vision of vocational education has an impact on changing educational goals, teaching and learning activities, learning tools and teaching based on world-class vocational education (Pavlova & Munjanganja, 2009, p. 80; Cheng, 2006, p. 25). According to Sudira (2015, p. 2) skills to deal with the 21st century include LIS 5C, namely Learning-Innovation Skill (LIS): Critical thinking and problem solving; Communications and Collaboration; Creativity and Innovation. Whereas according to Trilling & Fadel (2009, p. 8) the new skills needed by the world of work today are complex communication and expert thinking. Skills including complex communication are communications and collaboration while critical thinking and problem solving fall into the category of expert thinking skills. While creativity and innovation skills become supporters of the application skills of imagination and discovery. Vocational educa-

tion as an institution for preparing human resources (HR) for the world of work needs to pay attention to issues and renewal of the education substance (Sawyer, 2012; Littleton, Taylor, & Eteläpelto, 2012; Taylor, 2012).

According to Maley, Worley, & Dent (2009), career graduates can have a quality lifestyle with the provision of longer learning programs. In addition to learning programs, Maley, et al (2009) also mentions the main factor for achieving student success is through an approach by developing professional teachers who utilize local technology and culture. Whereas according to Abdullah, Hussin, Shonubi, Ghazali, & Talib (2018, p. 71) there is a significant relationship between self knowledge, job exploration, and career decision making. In line with Maley, et al (2009) & Hee (2014) says that in the learning process, students tend to like the deep learning approach of age and gender groups. Whereas according to Paimin, Hadgraft, Prpic, & Alias (2011), learning strategies do not have a direct relationship with the intention of learning unless mediated by motives for learning. According to Cournoyer & Deschenaux (2017), decision making by graduates is characterized by: (1) socio-professional and economic decline; (2) recognize yourself, personally and socially; (3) theoretical and practical values; (4) utilizing supporting conditions; and (5) closeness reconciliation. Wagiran (2008) shows that the top ten skills expected by industry include aspects of honesty, work ethic, responsibility, discipline, application of the principles of safety, initiative, creativity, cooperation, adjustment, self-confidence, and tolerance.

RESEARCH METHOD

The type of research used in this study is descriptive research with a document analysis approach. The procedure of the research carried out was by collecting official documents, then carried out an analysis to produce regional development programs, local potential, the spectrum of expertise of the existing vocational secondary schools and those which should be based on local potential. The analysis to determine the local potential which is a superior and potential sector is using LQ (Local Quotient) analysis. The instruments in this study were researchers, flashdisks, internet networks, notebooks, and cameras. The area of Cilacap

Regency is divided into 4 corridors for sub-development areas, which consist of each corridor totaling 6 sub-districts. Corridor 1 consists of six sub-districts, namely Dayehluhur, Wanareja, Majenang, Cimanggu, Cipari, and Karangpucung. Corridor 2 consists of six sub-districts, namely Sidareja, Gandrungmangu, Kawunganten, Kedungreja, Bantarsari, and Patimuan. Corridor 3 consists of six sub-districts, namely Adipala, Binangun, Kampung Laut, South Cilacap, Central Cilacap, and Cilacap Utara. Corridor 4 consists of six sub-districts, namely Nusawungu, Jeruk Legi, Kesugihan, Maos, Sampang, and Kroya. The grouping is considered based on the map of the administrative area and existing local potential characters.

RESULT AND DISCUSSION

Results

Regional Development Program

Based on the results of data analysis conducted, the results of the research were obtained to solve the research questions. The results of the first study were a description of the regional development program owned by Cilacap District within a period of 5 years (see Table 1)

Local Potential

The results of the second study are related to local potential which is the leading and potential sector in each corridor of the development area (see Tables 2 and 3).

Table 1.   Direction of Regional Development of Cilacap Regency

Year	Direction of Development Policy
2018	Improving the quality of basic education services in the realization of schools Minimum service standards are focused on providing quality education infrastructure (quality of classrooms, teacher's room, library and laboratory quality) and cultural character
2019	Improving the quality of basic health facilities and infrastructures and referencing in the realization of healthy communities is focused on realizing quality basic service facilities, quality referral facilities and clean and healthy lifestyles, providing social rehabilitation to people with social problems (PMKS), integration of gender mainstreaming (PUG)) and the Child Rights Mainstreaming Strategy (PUHA)
2020	Economic development and infrastructure in the framework of the region strengthens the development of peripheral and border areas focused on increasing access to tourism villages, innovation villages and infrastructure for economic development in the community. Democratic economic development is focused on improving the quality of micro-enterprises, cooperatives and enhancing traditional markets
2021	Improving the quality of regional infrastructure in Strengthening the development of peripheral and border areas focused on road repair, drainage, irrigation, waste management
2022	Improving the quality of regional infrastructure to achieve universal access (slum, sanitation and drinking water) is focused on fulfilling public housing, drinking water, sanitation and public space

(Source: Data Analysis Results, 2019)

Table 2.   Local Superior Sectors

Development Area	Business field	Criteria
Corridor 1	Agriculture, Forestry, Fisheries	Featured Sector (Base)
	Big Trade and Retail, Car and Motorcycle Repair	Featured Sector (Base)
Corridor 2	Agriculture, Forestry, Fisheries	Featured Sector (Base)
Corridor 3	Manufacturing Industry	Featured Sector (Base)
	Big Trade and Retail, Car and Motorcycle Repair	Featured Sector (Base)
	Construction	Featured Sector (Base)
Corridor 4	Manufacturing Industry	Featured Sector (Base)
	Agriculture, Forestry, Fisheries	Featured Sector (Base)
	Big Trade and Retail, Car and Motorcycle Repair	Featured Sector (Base)
	Construction	Featured Sector (Base)

(Source: Data Analysis Results, 2019)

Table 3.   Potential Sectors in each Corridor

Development Area	Business field	Criteria
Corridor 1	Manufacturing Industry	Potential Sector (Non Base)
	Construction	Potential Sector (Non Base)
Corridor 2	Manufacturing Industry	Potential Sector (Non Base)
	Agriculture, Forestry, Fisheries	Potential Sector (Non Base)
	Big Trade and Retail, Car and Motorcycle Repair	Potential Sector (Non Base)
	Construction	Potential Sector (Non Base)
Corridor 3	Agriculture, Forestry, Fisheries	Potential Sector (Non Base)
Corridor 4	-	-

(Source: Data Analysis Results, 2019)

Level of Alignment of the Expert Spectrum

Alignment levels were analyzed based on the spectrum of expertise in each corridor of the development area. The results of the third study are related to the existing level of SMK spectrum alignment with local potential (see Table 4, 5, 6, 7).

Table 4.   Level of Alignment of Existing Vocational Expertise Spectrum
with Local Potential in Corridor 1

No.	Areas of expertise	Expertise Program	Skill Competence	Level Alignment
1	Technology and Engineering	Technology and Construction	Construction and Property Business	Conformable
		Electricity Technique	Electric Power Installation Techniques	Misaligned
		Mechanical Engineering	Machining Techniques	Misaligned
		Automotive Engineering	Automotive Light Vehicle Engineering	Conformable
			Motorcycle Engineering and Business	Conformable
		Chemical Engineering	chemical analysis	Misaligned
2	Information and communication technology	Computer Engineering and Informatics	Multimedia	Misaligned
			Software engineering	Misaligned
			Computer and Network Engineering	Misaligned
3	Agribusiness and Agro-technology	Agribusiness Crop	Agribusiness Food Crops and Horticulture	Conformable
		Agribusiness Livestock	Agribusiness Poultry	Conformable
4	Business and management	Office management	Office automation and Governance	Misaligned
		Business and Marketing	Online business and marketing	Conformable
		Accounting and finance	Accounting and finance institutions	Misaligned
			Syariah banking	Misaligned
5	Tourism	Kulinary	Cullinary art	Misaligned
		Fashion	Fashion	Misaligned
6	Health and social work	Pharmacy	Pharmaceutical Industry	Misaligned
			Clinical and Community Pharmacy	Misaligned
7	Arts and Creative Industries	Art	Animation	Misaligned
	Level Alignment (Total Align/Ideal x 100%)			35.7%

(Source: Data Analysis Results, 2019)

Table 5.   Spectrum's Expertise Level Vocational Existing Alignment
with Local Potential Corridor 2

No.	Areas of expertise	Expertise Program	Skill Competency	Level Alignment
1	Technology and Engineering	Mechanical Power	Mechanical Power Installation	Misaligned
		Automotive Engineering	Automotive Light Vehicle Engineering	Conformable
			Techniques and Business Motorcycle	Misaligned
		Mechanical Engineering	Mechanical Machining	Misaligned
			Welding techniques	Misaligned
		Electrical engineering	Mechanical Audio Video	Misaligned
2	Information and communication technology	Computer Engineering and Information Technology	Multimedia	Misaligned
			Computer and Network Engineering	Misaligned
3	Agribusiness and Agro-technology	Agribusiness Crop	Agribusiness Food Crops and Horticulture	Conformable
4	Business and management	Office management	Office automation and Governance	Misaligned
		Business and Marketing	Online business and marketing	Conformable
		Accounting and finance	Accounting and finance institutions	Misaligned
6	Health and Social Work	Pharmacy	Clinical and Community Pharmacy	Misaligned
7	Maritime	Cruise Fishing Vessels	Teknika Fishing Vessels	conformable
8	Arts and Creative Industries	Art	Animation	Misaligned
		Level Alignment (Total Align/Ideal x 100%)		28.6%

(Source: Data Analysis, 2019)

Table 6.   Spectrum's expertise level vocational Existing Alignment
with Local Potential Corridor 3

No.	Areas of expertise	Expertise Program	Skill competency	Level Alignment
1	Technology and Engineering	Mechanical Power	Mechanical Power Installation	Misaligned
			Mechanical Power Plant	Misaligned
		Technology Construction and Property	Business Construction and Property	conformable
			Design and Building Information Modeling	conformable
		Automotive Engineering	Automotive Light Vehicle Engineering	conformable
			Techniques and Business Motorcycle	Misaligned
		Mechanical Engineering	Mechanical Machining	Misaligned
			Welding techniques	Misaligned
2	Information and communication technology	Computer Engineering and Information Technology	Multimedia	Misaligned
			Computer and Network Engineering	Misaligned
3	Agribusiness and Agrotechnology	Agribusiness Crop	Agribusiness Food Crops and Horticulture	conformable
4	Business and management	Office management	Office automation and Governance	Misaligned
		Business and Marketing	Online business and marketing	conformable
		Accounting and finance	Accounting and finance institutions	Misaligned
			Syariah banking	Misaligned
5	Health and Social Work	Pharmacy	Pharmaceutical Industry	Misaligned
6	maritime	Cruise Fishing Vessels	Nautical Fishing Vessels	conformable
7	Energy and Mining	Oil Technic	Mechanical Oil, Gas and Petrochemical	Misaligned
8	Tourism	Hospitality and Tourism Services	Hospitality	Misaligned
		Culinary	Cullinary art	Misaligned
		Fashion	Fashion	Misaligned
		Level Alignment (Total Align/Ideal x 100%)		43%

(Source: Data Analysis, 2019)

Table 7. Spectrum's expertise level vocational Existing Alignment
with Local Potential in Corridor 4

No.	Areas of expertise	Expertise Program	Skill competency	Level Alignment
1	Technology and Engineering	Mechanical Power	Mechanical Power Installation	Misaligned
			Mechanical Power Plant	Misaligned
		Automotive Engineering	Automotive Light Vehicle Engineering	conformable
			Techniques and Business Motorcycle	Misaligned
			Mechanical Ototronik	Misaligned
		Mechanical Engineering	Mechanical Machining	Misaligned
		Electrical engineering	Mechanical Audio Video	Misaligned
2	Information and communication technology	Computer Engineering and Information Technology	Multimedia	Misaligned
			Computer and Network Engineering	Misaligned
3	Business and management	Office management	Office automation and Governance	Misaligned
		Business and Marketing	Online business and marketing	conformable
		Accounting and finance	Accounting and finance institutions	Misaligned
			Syariah banking	Misaligned
4	maritime	Cruise Fishing Vessels	Nautical Fishing Vessels	conformable
			Teknika Fishing Vessels	conformable
5	Tourism	Hospitality and Tourism Services	hospitality	Misaligned
		Culinary	Cullinary art	Misaligned
		Fashion	Fashion	Misaligned
	Level Alignment (Total Align/Ideal x 100%)			28.5%

(Source: Data Analysis, 2019)

SMK needs Based Local Potential

The results of the fourth study is SMK needs based on local potential. Consists of a spectrum of vocational skills based on local potential, the need for teachers, school and grade (see Table 8, 9, 10, 11, 12).

Table 8. Spectrum Needs Vocational Skills-Based Local Potential Corridor 1

No.	Areas of Expertise	Expertise Program	Skill competency	Education Programs	
				3 Th	4 Th
1	Agribusiness and Agrotechnology	Agribusiness Agricultural Product Processing	Agribusiness Agricultural Product Processing	√	
		Agribusiness Crop	Agribusiness Food Crops and Horticulture	√	
			Agribusiness Crops	√	
		Agribusiness Livestock	Agribusiness Ruminant	√	
			Agribusiness Poultry	√	
		Forestry	Forest Products Production Technology	√	
2	Maritime	Fishery	Freshwater Fishery Agribusiness	√	
3	Technology and Engineering	Automotive Engineering	Automotive Light Vehicle Engineering	√	
4	Business and management	Business and Marketing	Online Business and Marketing	√	
			Retail	√	

(Source: Data Analysis, 2019)

Table 9.   Spectrum Needs Vocational Skills-Based Local Potential Corridor 2

No.	Areas of Expertise	Expertise Program	Skill competency	Education Programs	
				3 Th	4 Th
1	Agribusiness and Agrotechnology	Agribusiness Agricultural Product Processing	Agribusiness Agricultural Product Processing	√	
		Agribusiness Crop	Agribusiness Food Crops and Horticulture	√	
			Agribusiness Crops	√	
		Agribusiness Livestock	Agribusiness Ruminant	√	
			Agribusiness Poultry	√	
		Forestry	Forest Products Production Technology	√	
2	maritime	Fishery	Freshwater Fishery Agribusiness	√	

(Source: Data Analysis, 2019)

Table 10.   Spectrum Needs Vocational Skills-Based Local Potential Corridor 3

No.	Areas of expertise	Expertise Program	Skill competency	Education Programs	
				3 Th	4 Th
1	Technology and Engineering	Technology Construction and Property	Building Construction, Sanitation and Maintenance	√	
			Road Construction, Irrigation and Bridges	√	
			Design and Building Information Modeling	√	
		Automotive Engineering	Automotive Light Vehicle Engineering	√	
2	Business and management	Business and Marketing	Online Business and Marketing	√	
			Retail	√	

(Source: Data Analysis, 2019)

Table 11. Spectrum Needs Vocational Skills-Based Local Potential in Corridor 4

No.	Areas of expertise	Expertise Program	Skill competency	Education Programs	
				3 Th	4 Th
1	Agribusiness and Agrotechnology	Agribusiness Agricultural Product Processing	Agribusiness Agricultural Product Processing	√	
		agribusiness Crop	Agribusiness Food Crops and Horticulture	√	
			Agribusiness Crops	√	
		agribusiness Livestock	Agribusiness Ruminant	√	
			Agribusiness Poultry	√	
		Forestry	Forest Products Production Technology	√	
2	Maritime	Cruise Fishing Vessels	Nautical Fishing Vessels	√	
		Fishery	Freshwater Fishery Agribusiness	√	
			Agribusiness Fisheries Brackish Water and Marine	√	
3	Technology and Engineering	Technology Construction and Property	Building Construction, Sanitation and Maintenance	√	
			Road Construction, Irrigation and Bridges	√	
			Design and Building Information Modeling	√	
		Automotive Engineering	Automotive Light Vehicle Engineering	√	
4	Business and management	Business and Marketing	Online Business and Marketing	√	
			Retail	√	

(Source: Data Analysis, 2019)

Table 12. Vocational needs in each Corridor Development Area

Territory Development	School needs	Classroom needs	Teacher needs
corridor 1	9	108	228
corridor 2	17	202	337
corridor 3	4	76	137
corridor 4	6	79	185
total	36	465	887

(Source: Data Analysis, 2019)

Discussion

The high rate of unemployment of graduates of vocational school does not mean that the skills possessed incompetent, but many factors that influence such a mismatch of expertise with the needs of the workforce. Academic qualification is not a tool to ensure graduates obtain employment (Mazwin, 2006). Regional development programs aligned with CMS as a labor provider to establish the region can have an impact on the decline in the unemployment rate. Companies across the world are considering the graduates and their readiness to work (NICHE, 2009). Moreover, the quality of students as interns greatly influencing skills and personality after being labor graduate (Jingzhou, Yanjun, Jingru, Lihong, FeiZhu, Xinyu, & Jinmeng, 2018). The ability to build human relationships, the ability to utilize the information, the ability to plan for the future, and the ability to make decisions is a goal that should be given priority in the planning of vocational courses to produce graduates who are productive (Morita, 2018, p. 70). Sukardi (2011) said that knowledge or skill if done regularly and continuously, students/graduates will master the knowledge or the material thoroughly. According to Abdurrahman (2016), a program developed in vocational skills tend to be based on the needs of the potential of the area, just a little effort vocational graduates who can be absorbed by the local industry because most industries are still using traditional methods in knowledge as well as the production process. One cause of the graduates are not absorbed optimally is because middle-age population can not have that can facilitate the vocational school, by Mirza (2008) is not yet even education, especially in terms of quantity / number of vocational schools affect the amount of skilled labor produced, so the industry will use the labor outside the area. Kilpatrick (2004) ar-

gues that the education and training institutions have an important role in the development of the regions or the key to the interaction of the public and the government in regional development. The growth of an economy that occurred in the region will have an impact not only on economic growth in the region, but also in other parts of the economy (Setiawan, 2006). Kilpatrick (2004) argues that the education and training institutions have an important role in the development of the regions or the key to the interaction of the public and the government in regional development. The growth of an economy that occurred in the region will have an impact not only on economic growth in the region, but also in other parts of the economy (Setiawan, 2006). Kilpatrick (2004) argues that the education and training institutions have an important role in the development of the regions or the key to the interaction of the public and the government in regional development. The growth of an economy that occurred in the region will have an impact not only on economic growth in the region, but also in other parts of the economy (Setiawan, 2006).

Educational development based on local potentials rightly done extensive and systematic studies to produce proper planning target. In this study, conducted analiss local potential of the flagship, determine the spectrum of vocational skills based on local potentials, analyze the potential for population and employment. These variables should be mutually supportive vocational development. According Wagiran (2010), there are four main focus on the indepth study, namely; (a) an analysis of the potential and resources, (b) the preparation of some concepts of neighborhood-based education development (area), (c) short-term programming, medium, long, (d) human resource planning and supporting facilities.

Alignment level vocational skills spectrum conditions that exist today with local potential is still low. At one level alignment corridor is only 35.7%, in the corridor 2 was 28.6% and the third corridor of 43% while 28.5% 4 corridor. There are a lot of competency skills that should exist but not in any CMS. So that these conditions allow to make one of the reasons the unemployment rate is still higher vocational graduates. CMS needs to maximize the potential of the population can be used as new ways to increase the number of skilled labor.

Potential resources owned by Indonesia both natural and human potential should be managed better in improving the local economy. One solution for the government in improving the economic condition is to make the most of the potential of nature and the number of people as workers. Not all communities in all regions in Indonesia can receive education up to secondary school level, the gross enrollment rate indicates that there are still many people aged 16-19 years who did not receive education up to upper secondary level. The role of government was needed to reduce the school dropout rate.

Vocational Secondary School is a secondary educational institutions that can be used as a tool of labor scorer reliable. However, graduates of vocational far only capable of being a labor used for its own interests and the company in place of work (a foreign company) that would benefit outsiders. It takes a shift in the orientation of vocational graduates so that the potential of skilled labor can be utilized to promote the region and the country. So that economic inequality in each area can be reduced.

CONCLUSION

Planning vocational training based on local potentials can be done by analyzing the potential of the area to determine the economic sector which is the base and non-base, making a reference spectrum of expertise that is consistent with the potential of the area and to identify the level of alignment of the existing spectrum of expertise. In addition analysis of population aged 16-18 years who have not attained secondary education is needed, because in order to plan the needs of vocational and high school with a 70:30 ratio to facilitate the population. SMK needs based on local potential which has been obtained based on the research results are expected to assist the government in developing the area, reduce unemployment and boost the economy of the community, and create a new orientation for vocational school graduates to be able to work on building areas within maximize the potential of nature. The new orientation can be a solution for the government in preparing a skilled workforce.

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DEVELOPMENT OF THE TRADITIONAL DIGITAL GAMES FOR STRENGTHENING CHILDHOOD'S VERBAL SKILL

Nuur Wachid Abdul Majid
Universitas Pendidikan Indonesia

Taufik Ridwan
Universitas Pendidikan Indonesia

Abstract

The aims of this research was to: (1) know the portability aspect of the Traditional Digital Games application as a medium for early childhood learning; and (2) know the usability aspect of the Traditional Digital Games applications as a medium for early childhood learning. The method used in this study is Research and Development (R & D). The stages through which the waterfall will be useful to be able to produce reliable and effective software. The waterfall flowchart consists of: analysis, design, implementation, testing, and improvement. The results of this study were: (1) the results of testing from the portability aspect using a different smartphone, it can be concluded that traditional digital game applications have entered into a very good category; and (2) the results of testing usability aspects averaged over 70%, so that in both aspects the test was considered feasible and good. Although in the aspect of learning games the score shows 70.83% so it needs an increase.
Keywords: *traditional digital games for learning, education, verbal*

Contact   Nuur Wachid Abdul Majid   nuurwachid@upi.edu

Universitas Pendidikan Indonesia, Jl. DR. Setiabudhi No.229, Isola, Sukasari, Kota Bandung, Jawa Barat 40154, Indonesia

INTRODUCTION

Information and communication technology (ICT) has rapidly developed that all fields are using ICT to improve their activity. It has a positive and negative impact on several aspects. One of negative impact that using technology is children's growing motoric skills. Children will tend to be lazy to learn, if they know of game online (Pribadi, 2010). Children were getting violent content in a game without parental monitoring. They were threatened with negative information on the internet. The negative impact that found on the internet must be systematically prevented. Although, psychologically children prefer to use media gadgets as a tool to play.

Now, the traditional games have been forgotten by children since the digital games are easily obtained through gadgets. Firdaus (2017) said that 65% of children in Indonesia were not known of traditional games as the impact for development of technology. This situation was a threat to all, because technological devel-opments are increasingly massive and the role of parents to children is very lacking in educating and supervising their activities. Recognition of traditional games takes a long time and does not provide gadgets to children up to adulthood. Although in essence the role of gadgets in the current era is very high so that children are more preoccupied with electronic devices than traditional games.

The use of gadget for children has increased with the massive circulation of gadgets. Besides, parents' tendency to give gadgets to children who were hoped communication and learn with gadgets that have been impacting of increasing gadgets users. According the new research found that at least 30 million children and teenagers in Indonesia were the internet users and digital media (Sembiring, 2014).

Using education applications on gadgets can improve children's ability to see, hear and speak. The results of research by Joan Ganz Cooney Centre that five-year-old of children who use education application on Ipad have increased of vocabulary at least 27%, while three-year-old of children have increased of vocabulary at least 17 % (Wulandari, 2016). So, the gadget has a good impact on children if given a good application.

Digital game has interested by children, so the developer of digital application has innovated for designing and creating a game that has interested by children. One of designer and game advertising, Agate Studio, Dave Febrian shared his idea for developing the traditional game that it can be played comfortably and excitingly on a smartphone (Febrian, 2015). Febrian tried to bring his core experience when he saw children playing *Sobyong* (the game called *Pancasila 5 Dasar* in the Yogyakarta area) skillfully, even though today's children are usually more interested in playing video games. So, Agate Studio launched the application of *Kuis Pancasila 5 Dasar* with the aims of introduction traditional game for children. They will be increasing insight of nationalism related to the types of traditional games in Indonesia that the traditional game is more interesting than modern games. Children will add visual intelligence through typical of national displays packed with the latest designs.

Saputra & Ekawati (2017) did research on improving basic skills for children through the traditional game. The result of this research was to 13 traditional games have a good impacted to improve children' competencies. Competencies that were increased after played traditional games were kinesthetic, linguistic, logical-mathematical, visual-spatial, musical, natural, interpersonal, intrapersonal, and spiritual intelligence.

Traditional digital games are the media for learning that improves vocabulary and insight nationalism for childhood. It can be an alternative choice for educating and improve language skills for childhood. Traditional digital games are expected to popularize traditional Indonesian games to the global market. Thus it is necessary to design and develop Traditional Digital Games that they can be used as learning media for early childhood.

Electronic based games can provide motivation to learners. Enhance the use of education that is based on electronic games due to its importance in motivating learners (Alanazi, 2017). Teachers are aware that their roles when using new technologies in education have changed, specific curricula, pedagogy and practice highlights the need for a flexible model or approach of embedding digital games into primary classrooms (Allsop & Jessel, 2015). The teachers were very concerned about the application of technology and the rules if

applied to children. Pedagogical curricula and practices also require a flexible model for the application of digital games in the elementary school class.

Mobile game is a game that can be run on a mobile phone or cellular, so that users can play portable. Mobile games can be grouped into three categories: the first embedded game, which is a game that is embedded in a mobile device system (Shiratuddin & Zaibon, 2010). The second is a frequent SMS game in the form of live contest and polling. The types of mobile games can be classified as follows: Arcade /Action for example Doom and Alien; Sports for example bowling, golf, and football; Skills, strategies, and logic, for example Sudoku; Cartoons and boards, like monopolies; Game playing for example is final.

The implementation of education in Indonesia aims to ensure that the competencies taught by teachers can be accepted by students, and can master them thoroughly. Mastery of competence for students is a very important thing, because it can be a provision later when students face the dynamics of life. The process of mastering this competency sometimes has problems, because students do not understand the things given by the teacher.

Students' success in mastering competence is caused by many factors, one of which is employability skills. Employability skills require many skills that are ready in a career, work skills, technical expertise and academic knowledge (Majid & Sudira, 2017). This capability requires a relatively long time and is not instant. Students must go through many processes to obtain these abilities.

The impact of traditional games can improve various mental aspects in the players. As the results of research conducted by Dehkordi (2017) related to traditional games, that there is an influence on mental development through traditional games. Impacts on mental development with traditional game: (1) improving mental and spiritual strength and capabilities; (2) balancing emotions and managing and controlling; (3) eliminating conditions; (4) Creating balance in competition and openness to reasonable rules; and (5) achieving vivacity and high-spiritedness as important elements in continuous development (Dehkordi, 2017).

Oray-Orayan is a digital game that will be developed by adopting the traditional dragon snake game, while *Luluncatan* adopts jump rope. The second concept of the game is to provide learning to early childhood to stay familiar with traditional treasures of the archipelago. This can stimulate children to try and apply it to the real world. Thus the preservation of the culture of the archipelago will grow in children and the cultivation of national character values can work well. The traditional media-based digital games can be an alternative to support the learning done by the teacher. Students can play cheerfully and smartly with teacher supervision. This is also supported by the results of the Vitianingsih (2016) studied that examines r*e*lated educational games that can help learning. This educational game can help PAUD teachers and students to change conventional learning methods into simulation learning ways with game media and make it easy for PAUD students to learn about symbols, counting, matching images and composing random words.

The aims of this research was to: (1) know the portability aspect of the Traditional Digital Games application as a medium for early childhood learning; and (2) know the usability aspect of the Traditional Digital Games applications as a medium for early childhood learning.

METHOD

The method used in this study is Research and Development (R & D). This research was intended to combine fun learning with technological development. The output of the research will produce a game product prototype for the process of strengthening children's verbal abilities in recognizing letters and reading and improving children's visual-spatial intelligence.

In the steps taken in making the game using this R & D method, a software design was used the waterfall method. The stages through which the waterfall will be useful to be able to produce reliable and effective software. This method is a method in soft design that starts from the analysis phase until the software can be operated (Pressman, 2010). The process of making software that is passed is the phase of needs analysis, compounding, programming (coding), testing, to the operation of the software.
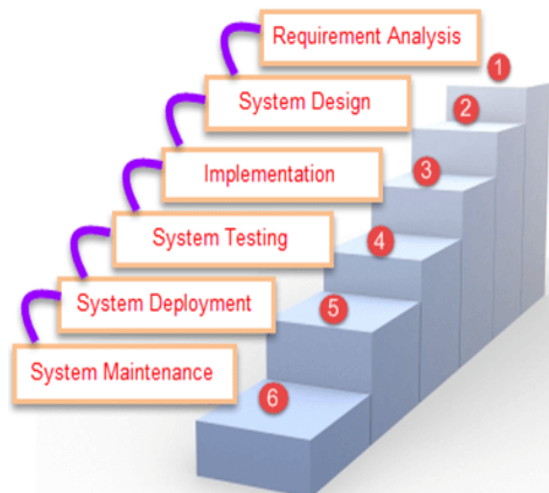
Figure 1. The waterfall flow chart in software development

The trial subjects in this study were intended for testing aspects of functionality and usability. Research subjects on functionality aspect were people who are experts in the field of software engineering. While the usability aspect is students or early childhood in aera Purwakarta.

The game development process will be carried out at 7 months of research. The game is designed to have two main screens namely the initial interface of the game, and the interface to the core game.

RESULTS AND DISCUSSIONS

Results

The game is one medium that is quite fun for the learning process, but the reality is just the opposite. Today's gaming market is filled with games that have a lot of content that presents elements of violence as its main element. This can cause a negative influence on child development.

Gadgets users also spread to children, making gadgets the main part of daily activities. Children are more fun playing with gadgets than with peers or playing outside the home. This condition makes children prefer to stay at home rather than going out with their friends. This phenomenon results in children being far more introverted and not good for children's psychological development (Yasmin, 2016).

One effort that can be done is to transform traditional games into digital forms.

To be able to make games that can improve verbal abilities and visual-spatial intelligence of children, it is necessary to do several processes so that the resulting games can be beneficial for children. The main target of game board design is children aged 3-10 years who are still in kindergarten or elementary school. However, it does not rule out the possibility of this game being played by all circles. The main requirement is feeling curious, wanting to learn, and trying new things.

The analysis phase started by recording everything needed by the game to be designed. Games that will be designed are *luluncatan* and *oorayan*. This name was taken to attract the attention of the child and cause curiosity of the child to find out the meaning of the word in the local language.

System modeling analysis is how to describe the data flow model and functional system when running. The modeling used in this study is the Unified Modeling Language.
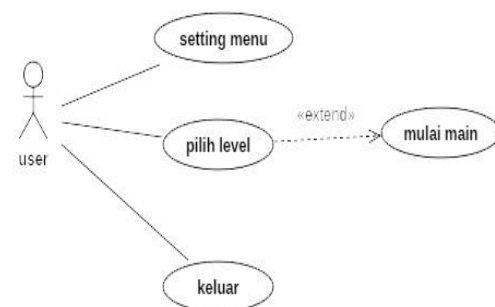
Figure 2. Use Case Diagram Analysis

From the figure, it can be explained that the system has 3 activity pieces or something that can be done, namely menu settings, select levels, and exit. When a user selects a level, it will automatically be taken to another activity, which is starting to play.

When a user plays a game, the user must still jump to the right and left of the screen not to be hit by the obstacles in front of him. On top of the game screen, there are certain words. Players must capture the letters according to the words at the bottom of the screen. Children who play this game will be tested for their understanding of verbal ability to recognize letters and visual-spatial intelligence on letters that are rotated in corners.

The storyboard was created to find out the content design for each part of traditional digital games to describe the series that were carried out at each stage through the game. Making storyboards is expected to facilitate the flow of games to be developed.
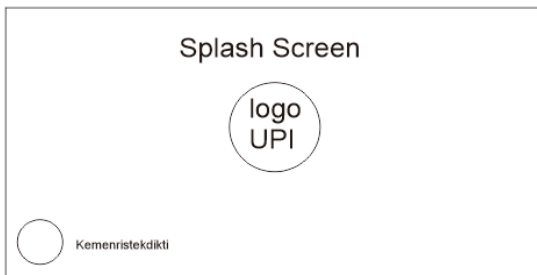
Figure 3.   Display of Splash Screen
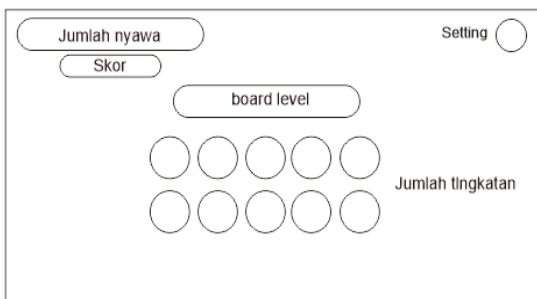
Figure 4.   Display of the Game Each Levels
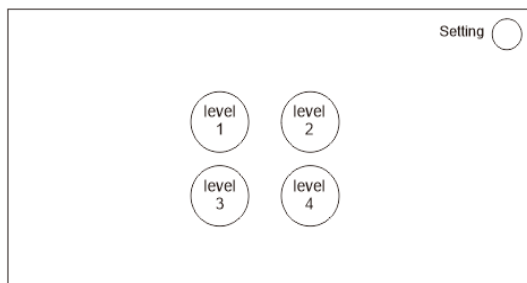
Figure 5.   Display of the Game Level Options

Product manufacturing is done after all stages in planning and design have been completed without any revisions. Product manufacturing is based on the requirements stated in the collection of materials so that the product can be produced properly. At this stage, the realization of the design has been carried out so that the appearance of the product is similar to what was designed.

The next development is coding the application that it can run well. It was using the Unity application. Unity is an integrated tool for creating games, building architecture and simulation. Unity 3D was first released only on

Mac Platform, the OS from Apple products. Over time, Unity 3D can be run on other operating systems, such as Windows and Linux. Basically, Unity is a 3D based game engine.

Figure 6.   Display of the Game *Luluncatan*

Figure 7.   Display of the Game *Oorayan*

This coding can be combined with designs that have been designed with the code entered into the unity application.
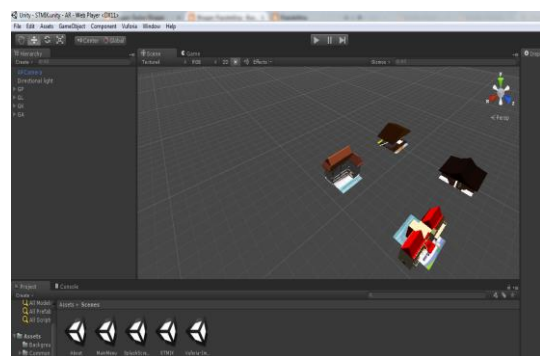
Figure 8.   Display of Unity to Create Games

Users can download and install the *Luluncatan* and *Oorayan* Game applications in *Playstore*. The application will continue to be developed after being tested to several users so that it can find better weaknesses and advantages of the game to be developed. Users can search for the game in Playstore on devices with an Android platform. The target of the game users is early childhood.

Figure 9. *Luluncatan* Game has Entered the Playstore

After getting an application like the picture above, users can install on a smartphone to be able to play the digital game. Both digital games have different characteristics, so users or children can play both games separately and not bore. The game is equipped with a choice of levels that can be passed if the user has completed the game at the lower level.

Discussions

Development of game media becomes an alternative in learning so that a teacher can feel the ease with the help of online-based learning media. This convenience is an attraction for students to continue learning independently and more actively. The independence of students in learning or self-directed learning becomes the main foundation of 21st-century learning, so the application of technology to learning becomes an obligation that cannot be separated between learning, students, and teachers.

Game-based learning has been applied to early childhood, especially when the game becomes the main media in classroom learning. The teachers have been trained in playing various types of games, so when they teach they don't feel stiff or worried in conveying the type of game. The game turned out to have a special attraction for students, so students feel happy and forget time.

A teacher was required to has the ability to collaborate games into learning. This ability was part of the competencies that must be mastered by a prospective teacher. Even on every education-based campus or LPTK (Institute of Teachers' Education), there are many materials or elements of the game that are learned by students, especially PGSD (Elementary School Teacher Education) and PGPAUD (Early Childhood Education Teacher Education). Although at the end of this

era, a lot of learning focused on collaboration with technology.

Figure 10. Teacher and student collaboration in the game

Technology-based learning was increasingly prevalent in the classroom, especially early childhood. This was influenced by the habits of children who daily collaborate more with technology or gadgets. Gadgets have an impact that can cause addiction, especially if children are accustomed to playing with gadgets, children will continue to use gadgets and the development of social interactions is hampered (Samodro, 2018). Even though the teacher must make sure the child stays socialized with other people when playing with gadgets (Astuti, 2017). Thus the role of parents and teachers is very influential on children's activities with the gadget being played.

The development of traditional digital games was a strategic step as part of parental supervision of children. In addition, they have character values inserted in games. Children will be trained in vocabulary in order to improve verbal abilities. In addition, fertilizing national values is also found in the games. This is proven by the existence of traditional games introduced to children. Given that children today are more familiar with modern games than traditional games.

The stages of developing traditional digital games were based on market needs by going through the stages of game planning first. Game planning was done using a use case activity model to describe the data flow model and system functionality when running. The modeling used in this study is the Unified Modeling Language. In addition, software and hardware requirements analysis were carried out as a supporting tool for building products.

The next stage was game design and development, which is designing the product as an attractive user interface. This design function is expected to make users interested in visiting or playing the game continuously. Making this game design is done based on vectors and bitmaps which will later be incorporated into unity and developed into games.

The next stage was an evaluation that the testing process carried out to test whether the software produced can function or not in accordance with the stages carried out in previous phases. The result is a game that can be operated by children. Tests carried out at the black box stage which showed the test class was successful. In the portability testing section, testing was carried out on 10 different devices or gadgets to ensure that the product can be installed and can be played properly. Based on the test results from the portability aspect by using a different smartphone, it can be concluded that the traditional digital game application can run well without errors. Thus the application in the portability aspect has entered into a very good category.

The trial on the usability aspect was conducted to test the feasibility of the product by being distributed to users or users in the form of questionnaires. This questionnaire is distributed to users with criteria as media experts and material experts. There are two aspects assessed in this section, namely: material aspects and learning aspects. The results of the assessment of the two aspects can be seen from the following table:

Table 1.   Material test Results

No	Assessment Aspect	Percentage
1	Material Aspects	82,91%
2	Learning Aspects	79,58%

Table 2.   Media aspect test results

No	Assessment Aspect	Percentage
1	Displays Aspects	80%
2	Navigations Aspects	77,083%
3	Game of Learning Aspects	70,83%
4	Product Resilience Aspects	78,12%
5	Additional Information Aspects	72,91%

Based on the table above it can be seen that the results of the material aspects test have a percentage of feasibility: (1) material aspects of 82.91%; and (2) the learning aspect was 79.58%. In the aspect of the media it has a percentage of feasibility: (1) the display aspect was 80%; (2) navigation aspects of 77.083%; (3) learning game aspects of 70.83%; (4) product durability of 78.12%; and (5) additional information aspects of 72.91%.

Based on the results of testing, the average usability aspect is above 70%, so that both aspects of the test are considered feasible and good. Although in the aspect of the game learning the value shows 70.83% so it needs improvement. The low aspect actually lies in point 4, namely: There is a challenging competition. Actually, the concept of this game is more to improve verbal abilities, so the challenges in the game were not as great as expected.

CONCLUSION

The conclusions of this research were: (1) the results of testing from the portability aspect using a different smartphone, it can be concluded that traditional digital game applications have entered into a very good category, section testing is carried out on 10 different devices or gadgets to ensure that the product can be installed and can be played properly; and (2) the results of testing usability aspects averaged over 70%, so that in both aspects the test was considered feasible and good. Although in the aspect of learning games the score shows 70.83% so it needs an increase.

Based on the test results from the portability aspect by using a different smartphone, it can be concluded that the traditional digital game application can run well without errors. Thus the application in the portability aspect has entered into a very good category. While the results of testing usability aspects averaged over 70%, so that in both aspects the test was considered feasible and good. Although in the aspect of learning games the score shows 70.83% so it needs an increase. The low aspect actually lies in point 4, namely: There is a challenging competition. Actually, the concept of this game is more to increase verbal ability, so the challenges in the game were not as great as expected.

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ANALYSIS OF DIFFICULTY LEVEL OF INFORMATION SYSTEM STUDENTS IN COMMUNICATING ENGLISH IN INDUSTRIAL ERA 4.0

Ratih Purwasih
STMIK Indonesia Padang

Rahimmulaily
STMIK Indonesia Padang

Abstract

Purpose of this study is to describe the difficulty level of information system students in communicating English. This study was descriptive quantitative research. The subjects in this study were 100 of second semester information system students and students who repeated (30 people) in 2017/2018 at STMIK Indonesia Padang. The study instrument used was a questionnaires and it were distributed to all research subjects. The processing of questionnaire data used the construct validity test which was supported by the SPSS application. The results of the data analysis of the study shows that the difficulty level of information systems students in communication is categorized at a fairly problematic level with an percentage index of 69%. Therefore, the results of this study can be used as a reference for lecturers in designing learning modules and syllabus that matches with the level of students' ability so that they will be categorized as students who are able to compete in the industrial era 4.0.
Keywords: *communication difficulties, English, SPSS*

Contact Ratih Purwasih ✉ ratihpurwasih254@gmail.com

🖥 STMIK Indonesia Padang, Jl. Khatib Sulaiman No.1, Lolong Belanti, Padang Utara, Kota Padang, Sumatera Barat 25136, Indonesia

INTRODUCTION

Technology world competition in the industrial era 4.0 is currently felt by all universities, especially universities which are based on technology discipline. STMIK Indonesia is a college that produces students who are able to compete in the field of Information Systems. This field of science does not only require students to be able to make a system and analyze the system, but also supported by good communication skills

Industrial era 4.0 in the aspect of communication skill requires students not only to be able to communicate at the national level but also international so that the students are able to compete globally with the knowledge they have. One of the media in international communication uses English as the language of instruction. According to Rohida (2018), states that the industrial era 4.0 and globalization require outstanding human beings and professionals with a high work ethic who do not give up. Strict competition among countries will spur one of individual in the ability to communicate in English.

The sudents of STMIK Indonesia who have background in information systems study program that are closely related to the world of technology and the world of industry should also have supporting abilities in communicating English. However, the preliminary observation was found in the meeting of English 1 and 2 which obtained were not able to improve the ability of the students of STMIK Indonesia both oral and written. It can be seen in Figure 1.
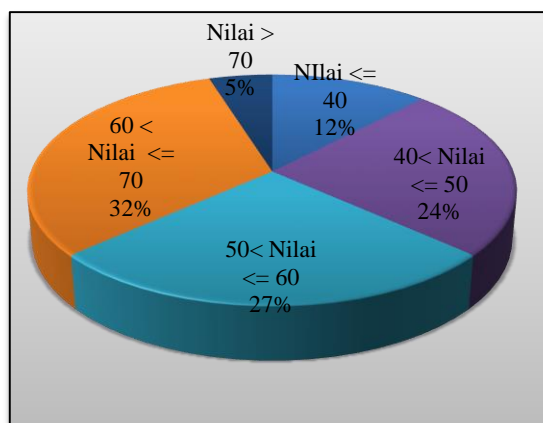
Figure 1. English Skill Averages of STMIK Indonesia Students

Based on Figure 1, the English skill averages of STMIK Indonesia students is varied, it can be categorized into several levels including low, medium and high. However, the category of low and medium are getting a quite high percentage. It illustrates that it is still difficult for students to communicate using English. Meanwhile, for students who have a computer background, have a very large opportunity in large national and international companies.

This study aims to obtain data on the descriptive quantitatively of difficulty level of English communication by students in Information Systems majors at STMIK Indonesia. The results to be achieved in this study is a valid percentage value to determine the level of difficulty of English communication skill which will have a positive impact in finding the method or design of teaching materials which can arranged and applied to students who are Non-*English Department*. Therefore, this study will discuss about "Analysis of difficulty level of information system students in communicating English industrial era 4.0".

The related theory that is used in this resarch are:

English Communication Ability

Communication ability is the ability to express thoughts, feelings, desires, through verbal communication or nonverbal communication to get understanding from others. Therefore, the ability to communicate has an impact on our understanding and that of others.

There are some definiton of communication have provided by the expert. According to (Zahroh & Sudira, 2014) Communication skills are an ability to communicate effectively with others, using oral, written, graphical, and other non-verbal means such as expressions. Then, according to John R. Wenburg, William W. Wilmot, Kenneth K. Sereno and Edward M. Bodaken (Mulyana, 2008), there are three frameworks for understanding communication, namely communication as one-way action, communication as interaction, and communication as a transaction. Based on the classification of communication, the focus of communication taken in this study is communication as interaction.

English communication difficulties

In the process of learning English, a student has a difficulty experiences in learning English as communication. These difficulties can cause a lack of maximum student learning outcomes in english subject. Several factors of student difficulties in communicating English include lack of vocabulary in English, difficulty in memorizing, diversified vocabularies pronunciation, fear of making mistakes, fear of being mocked by friends and lack of grammar knowledge (Megawati, 2016). This is also in line with the results of the study of Afisa (2015) which stated that the factors causing difficulties in speaking English were the number of frequencies of practice speaking English and psychology (in this case it could be said to be affective factors). Therefore, the difficulties of students in communicating English are categorized in several problems summarized in the Table 1.

Table 1. The Difficulties of Students in Communuicating English

Difficulties 1	Difficulty in Diversified Vocabularies Pronunciation
Difficulties 2	Vocabulary Difficulty in Mastering English Vocabularies
Difficulties 3	Difficulty due to Fear of being Mocked by Friends
Difficulties 4	Difficulty Due to the Limited Time to Learn
Difficulties 5	Difficulty Due to Irrelevant Learning Method
Difficulties 6	Difficulty Due to Lack of Self-Confidence
Difficulties 7	Difficulty Due to Constraints By Grammar When Arranging Words
Difficulties 8	Difficulty Due to Lack of Willingness in Learning English
Difficulties 9	Difficulty Due to Fast Bored

Construct Validity

Construct is a framework of a concept.Then, construct Validation is validity related to the ability of a measuring instrument in measuring the understanding of a concept that is measured. According to Jack R. Fraenkel (Siregar, 2017) construct validation (determination of construct validity) is the broadest

of its coverage compared to other validations, because it involves many procedures, including content validation and criteria validation.

How to test construct validation. A research instrument is said to be valid, if: (1) Product moment correlation coefficient exceeds 0.3; (2) Product moment correlation coefficient> r-table (α; n-2) n = number of samples; (3) Sig value $\leq \alpha$.

Cronbach Alpha Technique Reliability Test

This technique or formula can be used to determine whether a research instrument is reabel or not, if the answers given by respondents are in the form of scales, such as 1-3, 1-5, and 1-7 or respondent's answers that interpret attitude ratings.

The criteria for a research instrument are said to be reabel by using this technique, if the reliability coefficient $⟦(r⟧ \_11)> 0.6$. Stages of reliability testing using the Cronbach alpha technique, namely: (1) determine the variance value of each question item; (2) determine the total variance value; (3) determine instrument reliability

RESEARCH METHOD

This study is quantitative with using descriptive, namely by describing the object of study at the moment based on the facts as they are then analyzed and interpreted.

The subjects in this study are 100 of second semester information system students and students who repeated (30 people) in repairing English courses in 2017/2018 at STMIK Indonesia Padang. Samples of this study are 60 of second semester students and 22 of repeat class. The sampling technique used in this study is *probability sampling:* proportional stratified sampling to the size of the proportion $\frac{85}{130}$.

Object of this study is the factors of difficulty in communicating English. The study instrument is in the form of a questionnaire which is developed based on relevant study references.

Analyzing the data (questionnaire) in this study conducted a validity test. This validity test uses construct validity. Construct validity is validity that is related to the ability of measuring tool in gauging the understanding of a concept which being measured (Siregar,

2017). In addition to testing the validity of the questionnaire, the reliability test is also carried out using alpha cronbach technique as assisted count tool in testing the construct validity of the research team by using the SPSS version 16.0 application.

RESULTS AND DISCUSSION

Test Validity

The study of validity tests carried out on the amount of data as many as 85 respondents (students) by using the SPSS program *software*. The formula used in conducting the validity test is: $r_{hitung} \geq r_{table}$ then the item statement is valid.

The results of the difficulty validity test of 85 respondents (students), which each variable has $r_{hitung} \geq r_{table}$ or $r_{hitung} \geq 0.215$. Thus, it can be concluded that all data generated by the validity test are declared valid.

Reliability Test

Reliability test conducted to 85 respondents (students), following the result of reliability test to 85 respondents shows in the Table 2.

Table 2.   Test Results the Reliability

Variable	Value of Cronbach alpha	Decision
Difficulty	0.726	Reliable

Based on Table 2, it can be seen the results of a reliability test conducted to 85 respondents (students), which generates value of *Cronbach alpha* is 0.726 so that the collected data is declared reliable because the value of *Cronbach alpha* is greater from 0.6.

Evaluation of Difficulty Level of Students in Communicating English.

Evaluation of difficulty level of students in communicating English which is obtained from questionnaire is distributed to 85 of second semester students who take English courses 2. The level of difficulty is categorized into 4 categories, namely very problematic, problematic, quite problematic and no problem. Very problematic category, if the answer

score is 25% - 43.53%. Problematic, if the answer score is 43.82% - 62.35%. Quite problematic, if the answer score is 62.65%- 81.18%. No problem, if the answer score is 81.47% - 100.00%.

Research Data Description

Difficulty in Diversified Vocabularies Pronunciation

The result of data analysis on the level of difficulty in the pronunciation of various Vocabularies can be seen in the details on Table 3.

Table 3.   Student Difficulty in Diversified Vocabularies *Pronunciation*

No	Answer Options	Frequency	Value	(%)
1.	Very Problematic	5	5	6
2.	Problematic	32	64	38
3.	Quite Problematic	41	123	48
4.	No problem	7	28	8
	Total	85	220	100

Total value is 220 = Quite Problematic
Value percentage index 220: 340 x 100% = 65%

The results of data processing on Table 4.1 found the level of difficulty experienced by students in English vocabularies pronunciation is 65%. This percentage is categorized as quite problematic. Therefore, it needs a fairly creative teaching method in the teaching and learning process in the classroom, one of which uses interactive video media.

According to Kustandi & Sutjipto (2011), in teaching students about ways to use the "*organs of speech*" to speak words or sentences (pronunciation), then the video media will be more appropriate to use". The video is suitable for practicing pronunciation, besides displaying a recording or moving image, it also provides sound. The diagram above is the percentage of the number of students who have difficulty in pronunciation of vocabularies.

Difficulty in Mastering English Vocabularies

The result of data analysis of English difficulties related to the number of words that

must be mastered can be seen in the details on Table 4.

Table 4.   Percentage of Students who Experience Difficulty due to Mastering a lot of Vocabularies in English

No	Answer Options	Fre-quency	Value	(%)
1.	Very Problematic	4	4	5
2.	Problematic	37	74	43
3.	Quite Problematic	41	123	48
4.	No problem	3	12	4
	Amount	85	213	100

Total value is 213 = Quite Problematic
Value percentage index 213: 340 x 100% = 63%

The results of data processing on Table 4.2 found the level of difficulty experienced by students is due to too many vocabularies which must be mastered in English at the percentage index is 63%. This percentage is categorized as quite problematic, so it needs a solution to face this problem.

According to Nugroho, Nurkamto, & Sulistyowati (2012) to improve vocabularies skill for students by using *flash cards* will be more appropriate to use. *Flash cards are* suitable for adding vocabulary because the presence of images, texts and symbols so that it attracts the students' attention, making students motivated and focused on learning vocabulary. This method can later be applied in the teaching methods at STMIK Indonesia Padang.

Difficulty due to Fear of being Mocked by Friends

The result of data analysis in English difficulty due to fear of being mocked by friends can be seen in the details on Table 5.

The result of data processing on Table 5 found the level of difficulty experienced by students due to fear of being mocked by friends is at 81%. It means that the percentage of this difficulty level is categorized as no problem. It shows that the mentality of students in facing the mockery of friends can still be overcome.

Table 5.   Difficulty table due to Fear of Being Mocked by Friends

No	Answer Options	Frequency	Value	(%)
1.	Very Problematic	5	5	6
2.	Problematic	11	22	13
3.	Quite Problematic	26	78	31
4.	No problem	43	172	50
	Total	85	277	100

Total value is 277 = No Problem
Value percentage index 277: 340 x 100% = 81%

Difficulty Due to the Limited Time to Learn

The result of data analysis in English difficulty due to the limited time to study can be seen in the details on Table 6.

Table 6.   Difficulty Table Due to the Limited Time to Learn

No	Answer Options	Fre-quency	Value	(%)
1.	Very Problematic	12	12	14
2.	Problem	26	52	31
3.	Quite Problematic	31	93	36
4.	No problem	16	64	19
Total		85	221	100

Total value is 221 = Quite problematic
Value percentage index 221: 340 x 100% = 65%

The results of data processing Table 6 found the level of difficulty experienced by students due to limited time to learn is 65%. The result of this percentage indicates that student' interest and motivation in learning which their background *Non English department* in improving their English communication skill is still low. This is because STMIK Indonesia has background in the information system study program. The students only focus on their knowledge so that there is a limited effort of students in *upgrading the* ability to communicate English in personal skills for students.

According to Nurhidayati (2016) "To take the time to study, students must be able to manage time with technique of *problem solving* and time management". *Problem solving* and time management are suitable because

both require students to have planning which is organized, consistent, purposeful and discipline in using time. In addition, techniques of *problem solving* can also train students to think critically in identifying problems, learning habit and finding solution to face problems.

Difficulty Due to Irrelevant Learning Method

The result of data analysis on English difficulty related to irrelevant learning method. It can be seen in the details on Table 7.

Table 7.   Difficulty Table Due to Irrelevant Learning Method

No	Answer Options	Frequency	Value	(%)
1.	Very Problematic	7	7	8
2.	Problematic	25	50	29
3.	Quite Problematic	31	93	37
4.	No problem	22	88	26
	Total	85	238	100

Total value is 238 = Quite Problematic
Value percentage index 238: 340 x 100% = 70%

The result of data processing on Table 7 obtained the level of difficulty experienced by students due to the irrelevant learning method is at 70%. This percentage of difficulty level is categorized as quite problematic, so it needs a solution to overcome this problem.

According to Wilson, Copeland Solas, & Guthrie-Dixon (2016) stated that for relevant learning method, use *Mind Map. Mind Map is* suitable because it can open the potential of the human brain regarding words, images, numbers, logics, rhythms, colors, spatial awareness in a unique way so that students can improve their language skill. Another learning method that can be used to improve students learning is using interactive CD in improving learning student result n effectively and cognitively (Surjono & Susila, 2013)

Difficulty Due to Lack of Self-Confidence

The result of data analysis on English difficulty related to lack of self-confidence. It can be seen in the details on Table 8.

Table 8.   Difficulty Table Due to Lack of Self-Convidence

No	Answer Options	Frequency	Value	(%)
1.	Very Problematic	18	18	21
2.	Problematic	21	42	25
3.	Quite Problematic	36	108	42
4.	No problem	10	40	12
	Total	85	208	100

Total value is 208 = Problematic
Value percentage index 208: 340 x 100% = 61%

The result of data processing on Table 8 found the level of difficulty experienced by students due to the lack of self-confidence of students in communicating English at number 61 %. This level of difficulty is categorized on the problematic level. So, a solution is needed to overcome this problem. Therefore, a special community is needed for students to exchange ideas and communicate each other with English in order to create self-confidence. This is also supported by expert opinion.

According to Deswarni (2017) to increase self-confidence, students must do regeneration". By entering this cadre, students are required to participate in it. From this matter, students usually exchange ideas, convey ideas or find solutions to solve problems so that it can increase social interaction and can train and be able to launch their communication.

Difficulty Due to Constraints By Grammar When Arranging Words

The result of data analysis on English language difficulty related to constraint by grammar can be seen in the details on Table 9.

The result of data processing on Table 9 obtained the level of difficulty experienced by students due to being constraint by grammar in arranging English words is at 61%. This level of difficulty is categorized as the problematic level. Therefore, it is better for students who are not belonging to English study programs to be better not too focus on the *grammar*. It limits the students at the beginner level in communicating English.

Table 9.   Difficulty Table due to Constraint by Grammar When Arranging Words

No	Answer Options	Fre-quency	Value	(%)
1.	Very Problematic	10	10	12
2.	Problematic	33	66	39
3.	Quite Problematic	35	105	41
4.	No problem	7	28	8
	Total	85	209	100

Total value is 209 = Problem
Value percentage index 209: 340 x 100% = 61%.

Difficulty Due to Lack of Willingness in Learning English

The result of data analysis on English difficulty related to lack of willingness in learning English can be seen in the details on Table 10.

Table 10.   Difficulty Table Due to Lack of Willingness in Learning English

No	Answer Options	Fre-quency	Value	(%)
1.	Very Problematic	6	6	7
2.	Problematic	17	34	20
3.	Quite Problematic	27	81	32
4.	No problem	35	140	41
	Total	85	261	100

Total value is 261 = Quite Problematic
Value percentage index 261: 340 x 100% = 77%

The result of data processing on Table 10 found the level of difficulty experienced by students due to lack of willingness in learning English is at 77%. It is categorized as quite problematic. The result of this percentage of difficulty level indicates that students' willingness or intention to learn English is very low.

Difficulty Due to Fast Bored

The result of data analysis on English difficulty due to fast bored can be seen in the details on Table 11.

Table 11.   Difficulty table Due to Fast Bored

No	Answer Options	Fre-quency	Value	(%)
1	Very Problematic	6	6	7
2	Problematic	16	32	19
3	Very Problematic	35	105	41
4	Problematic	23	92	27
	Total	85	240	100

Total value is 252 = Sufficient Problems
Value percentage index 252: 340 x 100% = 74%

The result of data processing on Table 11 found the level of difficulty experienced by students due to fast bored in learning English is at a percentage of 74% which is categorized as quite problematic. The result of this percentage of difficulty level indicates that students' willingness or intention to learn English is very low.

Difficulty Due to No Supporting Facilities

The result of data analysis on English difficulty related to no supporting facilities can be seen in the details in Table 4.10

Table 12.   Difficulty Table Due to No Supporting Facilities

No	Choice Answer	Fre-quency	Value	(%)
1.	Very Problematic	11	11	13
2.	Problematic	16	32	19
3.	Quite Problematic	35	105	41
4.	No problem	23	92	27
	Total	85	240	100

Total Value is 240 = Quite Problems
Value percentage index 240: 340 x 100% = 71%

The result of data processing on Table 12 obtained the level of difficulty experienced by students because there are no supporting facilities that support them in learning English is at a percentage of 71% which is categorized quite problematic. The result of the percentage level of difficulty indicates that limited facilities in learning English are also factor that greatly influences their English communication skills.

The Results of Research Analysis

The result of the descriptive quantitative research data that have been described can be seen that the difficulty level of information system students in communicating English is categorized at the level of Quite Problematic with the percentage index is 69%.

The percentage results obtained from the total value of all questions related to the difficulties experienced by students when communicating in English. Data on all these difficulties can be summarized in Table 13.

Table 13. Data of All Difficulties

No	Answer Options	Item Number
1.	Very Problematic	86
2.	Problematic	470
3.	Quite Problematic	999
4.	No problem	784
Total Value		2339
Total Value Max		3400
Index Percentage		69%
Category		Quite Problematic

CONCLUSION

Based on the result of descriptive quantitative research data in this study can be concluded that the difficulty level of information system students in communicating English is categorized at the level of Quite Problematic with the percentage of difficulty level is 69%.

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USE OF THE DELPHY TECHNIQUE:
A CASE FOR THE DEVELOPMENT OF ECOTOURISM
IN WESTERN LOMBOK

Soenarto
Universitas Negeri Yogyakarta

Rahmawati
Economics and business Faculty Universitas Sebelas Maret Surakarta Indonesia

Abstract

Delphi technique was developed in 1950 by researchers at the Rand Corporation led by Norman Delkey and Olaf Helmer and has since been used in hundreds of businesses forecasting in the public and private sectors. Delphi technique is a judgmental forecasting procedure for obtaining, exchanging, and developing an informed opinion about future events. Therefore, the Delphi technique is a systematic way to get a consensus of opinion among the experts who have related interests through a panel discussion. The objective of most Delphi is the reliable and creative exploration of ideas or the production of suitable information for decision making. The key features of the Delphi technique, namely: (1) systematic, (2) questionnaire, (3) expert judgment, (4) iteration process, and (5) feedback. Baseline characteristics of the Delphi technique (conventional) there are five, namely: (1) anonymity, (2) iteration, (3) controlled feedback, (4) statistical group response, and (5) expert consensus. While the characteristics of a policy Delphi also five, namely: (1) selective anonymity, (2) informed multiple advocacies, (3) polarized statistical response, (4) structured conflict, and (5) computer conferencing. Steps in the application of policy Delphi there are seven, namely: (1) issue specification, (2) selection advocates, (3) questionnaire design, (4) analysis of first-round results, (5) development of subsequent questionnaires, (6) organization of group meetings, and (7) preparation of final report.

Keywords: *expert judgment, entreprenourship, ecotourism, consensus, Delphi technique*

Contact   Soenarto   soenarto@uny.ac.id

Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Depok, Sleman 55281, Yogyakarta, Indonesia

INTRODUCTION

History of the Delphi Technique

Delphi is actually the name of a valley in ancient Greece guarded by the dragon Apollo. Dragon Apollo is known to have the ability to see the future. However, William N. Dunn has another version. Dunn (1994) states that the Delphi technique (whose name was taken from the temple of Apollo I n Delphi, where the Greek shaman vowed to see the future) was developed in 1948 by researchers at the Rand Corporation and has since been used in hundreds of forecasting businesses in the public sector and private.

Initially, this technique was applied to military strategy problems, but gradually it could be applied to other contexts: education, technology, marketing, transportation, mass media, medicine/pharmacy, information processing, research and development, space exploration, housing, budget and quality of life. In the beginning, this technique emphasized the use of experts to study predictions based on data empirical, but then began to apply to value forecasting problems in 1960.

The Delphi technique has been used by analysts in various countries, from the United States, Canada, Britain to Japan and the Soviet Union.

The Delphi technique is finally widely used and accepted to achieve convergence of opinions about the real-world knowledge requested by experts in a particular topic. Based on the reason that, "two heads are better than one, or ...... n heads are better than one", the Delphi technique is designed as a group communication process aimed at conducting detailed checks and discussions on specific issues aimed at goal setting, policy inquiry, or predict the occurrence of future events. The general survey tries to identify "what is," while the Delphi technique attempts to overcome "what could/should be".

The purpose of the Delphi Technique

In the Delphi technique, there were no group discussions between experts. This is to minimize the possibility of a direct confrontation that might occur between experts. Thus, a consensus can be reached based on relevant information. The purpose of the Delphi technique is to explore the creative and reliable ideas or produce information that is suitable for decision making.

Definition of Delphi Technical

Then the question is what is the Delphi technique/method? Dunn (1994) states that "Delphi technique is a judgmental forecasting procedure for obtaining, exchanging, and developing informed opinion about future events". The Delphi technique is an opinion forecasting procedure to obtain, exchange, and make opinions about future events.

The Delphi technique is a systematic method of gathering opinions from a group of experts through a series of questionnaires, where there is a feedback mechanism through 'round questions held while maintaining the anonymity of respondents' responses (experts) (Foley, 1972). The Delphi method is a structured communication technique, originally developed as an interactive forecasting method that depends on a number of experts

Linstone & Turoff (1975) states that *Delphi may be characterized as a method for structuring a group communication process so that it is effective in allowing a group of individuals, as a whole, to deal with a complex problem".*

The Delphi technique is a way to organize ideas among experts to improve a problem in the future (Weaver, 1971). With Delphi techniques, various opinions about a phenomenon among people who have related interests can be collected, sought similarity points, and summarized so that it is a joint consensus to determine a program plan (Soenarto, 1988). Therefore, the Delphi technique is a systematic way to get opinion agreement among experts who have related interests through panel discussions. Stufflebeam & Shinkfield (1985) suggested a number of agreements that could be achieved through the Delphi technique, among others: (1) determining the objectives of the institution; (2) direction and type of questions in the needs analysis using the need assessment, and (3) basic requirements that must be met to achieve the objectives.

In the standard version, experts answer the questionnaire in 2 or more rounds. After each round, the facilitator provides a summary of expert forecasting from the previous round and the reasons they gave for their assessment. Thus, experts are advised to revise the previous

answers based on the answers previously compiled. In this process, the answers will converge and finally, the group will find the correct 'answer'. In the end, this process will stop after the criteria that have been agreed to have been reached (the number of rounds, achieving consensus, and stability of results).

Other versions, such as Delphi Policy, have been designed for normative and explorative use, especially in the area of social policy and public health. In Europe, web-based experiments have used Delphi as a communication technique for interactive decision making and *e-democracy*.

Delphi is based on the principle that forecasting (or decision) of structured groups/individual is more accurate than unstructured groups. This is indicated by the term "collective intelligence". This technique can also be adapted for the use of face-to-face meetings (therefore it is called a mini Delphi / ETE). Delphi has been widely used for business forecasting and has certain advantages over other approaches.

The key features of the Delphi technique are (1) systematic, (2) questionnaire, (3) expert opinion/assessment (expert judgment), (4) iterative process (round), (5) feedback: individual opinion moderated by the group.

Examples of applications: (1) forecasting technology, for example: treatment in 1990; (2) Demand forecasting, for example: Hawaii tourism in 2000; (3) Forecasting of changes in hotel management in Hong Kong (1997); (4) Assessment of environmental impacts in the development of Salt's Mill; (5) Priority in the management of cultural performances; (6) Definition of ecotourism.

Characteristics of Delphi Technical

The application of the Delphi technique was initially driven by concern for the ineffectiveness of committee work, expert panels, and other group processes. This technique is designed to avoid various sources of communication distortion found in these groups, such as domination of groups by one or several people; pressure to follow core group opinions; differences in personality and interpersonal conflict; and difficulty in opposing people who are openly authorized. To avoid these problems, according to Dunn (1994), the initial application of the Delphi technique emphasizes five basic principles, namely: (1) Anonymity,

all experts or knowledgeable people give responsiveness separately and anonymity (not knowing each other between them) is really maintained; (2) Iteration, assessment of each individual is collected and communicated back to all experts who participated commenting in two rounds or more, so that the social learning process takes place and it is possible to change the initial assessment; (3) Controlled feedback, Communication of the assessment is carried out in the form of a summary of the answers to the questionnaire, (4) Statistical group response. The summary of each person's responses is conveyed in the form of a measure of central tendency (usually median), dispersion (interquartile), and frequency distribution (histogram and frequency polygon); (5) Expert consensus, the main objective, with a few exceptions, is to create conditions in which the consensus among the experts is the final and most important result.

Meanwhile, according to Garrod (2007), the characteristics of the Delphi technique are: (1) qualitative research but with quantitative elements; (2) depends on the judgment of a number of experts; (3) An iterative process, which occurs during several "rounds"; (4) Positive points: (a) flexible; (b) suitable for getting issues/insights that have not yet appeared (below the surface); (c) suitable in finding difficult questions/experts; (d) more structured than conventional interviews; (5) but it is also criticized for: (a) often called "discredit", (b) allegedly anti-democratic/anti-participatory (c) lately, executions have often been careless, which has somewhat damaged the reputation of this technique.

Steps of Implementing Delphi Techniques

According to Jakaria (2009), the steps in implementing the Delphi method are seven (7), namely: First, problem identification and specification. The researcher identifies the issues and problems that are developing in his environment (his field), the underlying problems, or the problems faced which must immediately need resolution.

Second, personal identification and selection. Based on the areas of prolems and issues that have been identified, the researcher determines and selects experts who pay attention, and is interested in the field, which enables the achievement of goals. The number of

respondents at least matches the subproblems, level of expertise, and/or authority.

Third, questionnaire design. The researcher composes the items of the instrument based on observed variables or problems to be solved. The instrument items should fulfill content validity. The question is in the open-ended question, except if the problem is specific.

Fourth, sending questionnaire and analy-sis of respondents for first round. The researcher sends the questionnaire in the first round to the respondent, then reviews the instrument and analyzes the answers to the instruments that have been returned. The analysis is done by grouping similar answers. Based on the result of the analysis, researchers revised the instrument.

Fifth, Development of subsequent questionnaires. The questionnaire resulting from the review in the first round was developed and improved, followed by the second and third rounds. Each revision results are sent back to the respondent. If you experience difficulties and doubts in summarizing, the researcher can ask for clarification from the respondent. In the Delphi technique, it is usually used up to 3-5 rounds, depending on the breadth and complexity of the problem until the consensus is reached.

Sixth, organization of group meetings. The researcher invited the respondents to hold a panel discussion, for clarification of the answers given. This is where argumentation and debate can occur to reach consensus in providing answers to the design of a product or research instrument. By face to face contact, researchers can ask in detail about the response that has been given. The final decision about the results of the polls is said to be good if a minimum of 70% consensus is reached.

Seventh, Prepare final report. Researchers need to make a report about the preparation, process, and results achieved in the Delphi technique. The results of the Delphi technique need to be tested in the field with respondents who will use a much larger number of models or products.
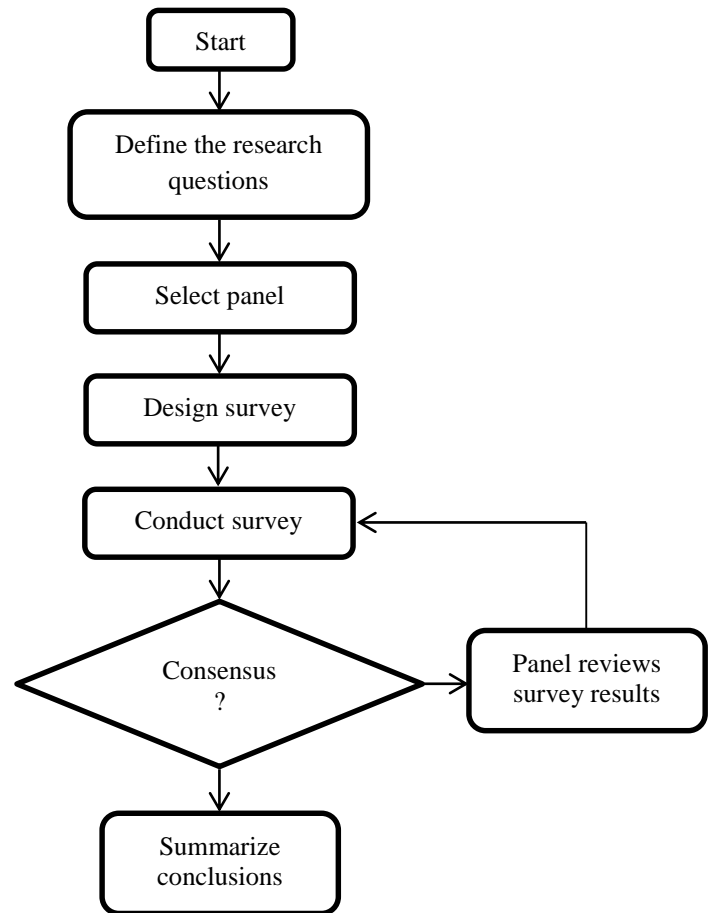
Figure 1. Steps of Delphi Techniques

Delphi Technique Anvantage

According to Garrod (2007), the Delphi technique has a number of advantages, namely: (1) this technique is very flexible to be applied in various situations and various complicated problems, where often there is no suitable analytical method to apply; (2) the iterative procedure allows experts to rethink their assessment based on feedback from other expert colleagues; (3) this process also gives more time to participants to rethink their ideas before giving an assessment, this will certainly provide a better quality response; (4) an anonymity approach allows experts to be more free to argue, without pressure from any party; (5) the possibility of individual influence is also automatically eliminated; (6) the existence of "transfer issues" that come out of the main focus of the discussion can be controlled by the project manager (the researcher himself); (7) this process will produce notes from group thoughts that can be reviewed when needed; (8) this method can be used to evaluate the

distribution of opinions from experts or consensus points (things agreed upon).

Delphi Technology Weaknesses

Besides having a number of advantages, the Delphi technique also has a number of weaknesses. According to Garrod (2007), the weaknesses of the Delphi technique are: (1) the Delphi technique can be very sensitive to the following: (a) the level of expertise of the panelists, (b) panelist composition, (c) clarity of questions, (d) the way project managers (researchers) report outliers, (e) administration of the questionnaire; (2) this technique assumes experts allow their judgment to be revised by the opinions of others; (3) the expert panel is vulnerable to attrition (weakening process) due to: (a) saturation with research subjects / topics, (b) dissatisfaction with the process, (c) lack of time to complete the Questionnaire; (4) some Delphi practitioners / users use the influence of money / persuasion morally to convince the panelists to "keep on track" in this case, but this can lead to bias related to the results of the study; (5) there is a possibility in the form of 'pseudo consensus', where the panelists agree and adjust with the assesment of the group; (6) this technique often requires a quality amount of time to complete the questionnaire and often takes a lot of time from the researcher (3-5 rounds).

Guide for Implementation of Delphi Engineering

Then the question is how to do the Delphi technique? According to Garrod (2007), there are ten (10) guidelines in using the Delphi technique, namely: (1) the Delphi technique should not be seen as the main tool in investigations but rather as a support / expansion tool for studies that have been developed and a more reliable method of investigation; (2) topics must be appropriate, there should be no biased answers to the questions asked; (3) questions must be tested first to avoid ambiguity; (4) researchers must be true experts in their fields; (5) panelists should consist of good combinations between disciplines and fields of expertise; (6) there should be sufficient time allocation for experts to think deeply about the questions asked; (7) after the next round begins, experts who are late in completing the previous round must immediately work on the next round; (8) the weakening of the panel can be minimized by selecting experts who have a strong interest in the output of the project / research; (9) it is recommended to use financial compensation and moral invitation as a tool to ensure that experts remain committed to the project/research; (10) experts must be sure that the Delphi technique is valid for dealing with existing problems.

Delphi Policy

Principles such as anonymity, iteration, controlled responses, statistical group answers, and expert consensus are characteristics of the conventional Delphi technique (Syafruddin, 2010). Conventional Delphi, which dominated this field until the late 1960s, must be distinguished from Delphi policy. Delphi policy is a constructive response to the limitations of conventional Delphi and is an attempt to create a new procedure that fits with the complexity of policy issues (Dunn, 1994). In the statement of the main architect:

> *Delphi was originally created and practiced to address technical topics and seek consensus among homogeneous expert groups. But, Delphi policy, seeks to produce the most likely opposition views on the potential resolution of a policy issue ... a policy issue is something that no expert has about it, but only knowledgeable advisors and people who are used to reference.*

While the Delphi policy is based on two of the conventional Delphi principles (i.e. iterations and controlled responses), this technique also introduces several new principles:

Selective anonymity.

Participants in a Delphi policy remain anonymous only during the initial round of forecasting efforts. After rival arguments about alternative policies emerge, participants are asked to openly debate their views.

Double Advocacy of Knowledgeable People (informed multiple advocacy).

The process for selecting participants is based on criteria of interest and level of knowledge, not merely "expertise". In forming a Delphi group, the investigator only tried to select representatives from a group of know-

ledgeable advocates who might be present in certain situations.

A Statistically Polarized Response

In summarizing the opinions or opinions of experts, it are used the ways that emphasize disagreement and conflict. While conventional measures can also be used (median, range, standard deviation), the policy Delphi adds to it with various measures of polarization between individuals and groups.

Structured Conflict

Starting from the assumption that conflict is something that is natural in policy issues, various efforts have been made to use disagreements and conflicts to creatively explore their alternatives and consequences. In addition, efforts are made to express and explicitly assumptions and arguments that underline conflicting opinions. However, the results of a Delphi policy are not completely open, so that consensus and continuing conflict can be something that appears in the process itself.

Computer Conferencing

If possible, computer consultation is used to design a continuous anonymous process between individuals who are physically separate. Computer conferences remove the need for several separate Delphi rounds.

Steps of Application of Delphi Policy

A Delphi policy can be done in various ways, depending on the context and ability of people who use this technique. Because Delphi policy is a study, it involves a large number of technical problems, including sampling, questionnaire design, reliability and validity, and analysis and interpretation of data. Although these problems are beyond the scope of this chapter, it is important to obtain a thorough understanding of the process of implementing a Delphi policy. According to Dunn (1994), a Delphi policy can be described as a series of interrelated stages.

Step 1: Issue specifications.

In this case, the analyst must determine what issues advocates must comment on. For example, if the area of concern is a policy of abuse of medicine, one of the issues is "Per-

sonal use of marijuana must or should not be permitted". One of the main problems of this stage is deciding what issues should be gathered from the participants, and what the analyst must produce. If the analyst is familiar with the area of concern, it is possible to list issues before the first Delphi round is held. These issues can be included in the first questionnaire, although respondents must be free to add or reduce issues.

Step 2: Select advocates.

Here key actors in an issue are selected. However, to isolate a group of advocates who represent opposing views, it is necessary to use sampling procedures in a frank manner. One way to do this is to apply the "snowball" sampling method. Here the analyst begins to identify an advocate, usually a person who is known to be influential in the issue area and asks him to give the names of two other people who agree and disagree with his views. The two people were also asked to do the same, which eventually got two or more people who were very agreeable and very disagreeable, and so on (hence the term "snowball"). Advocates should be as different as possible, not only in their position, but also in their relative influence, formal authority, and group affiliation. The size of the sample can range from 10 to 30 people, although this depends on the nature of the issue itself. The more complex the issue is, and the more heterogeneous the participant is, the greater the sample needed to represent the range of advocates.

Step 3: Make a questionnaire.

Because a Delphi policy takes place in several rounds, the analyst must decide which items will be submitted in the questionnaire to be used in the first round and later rounds. However, the second round questionnaire can only be made after the results of the first round are analyzed; the third round questionnaire must wait for the results of the second round, and so on. Therefore only the first round of questionnaires can be made in full. Although the first round questionnaire may be less structured (with many open questions), this questionnaire can also be relatively structured as long as the analyst has a good idea of the main issue. The first round of questionnaires can include several types of questions: (1) forecasting questions that ask respondents to

give subjective estimates of the probability of occurrence of an event, (2) questions about issues that ask respondents to sort issues on the importance of the issue, (3) questions about the purpose of asking assessment of the desirability and / or feasibility of the effort to pursue a goal, and (4) questions about choices that require respondents to identify alternative actions that might help achieve goals and objectives.

Several types of scales are available to measure the responses of each item. One pro-

cedure is to use a different scale with different types of items. For example, a certainty scale can be used primarily for forecasting items; interest points for issue items; a scale of desire and feasibility for the purpose of the item; and a combination of these scales for selected items. The best way to show what is involved is to describe the way the items and scales are used in a Delphi policy questionnaire. This has been done in Table 1.

Table 1.   Types of Items and Scales Used in the Delphi Questionnaire Policy

ITEM TYPE	ITEM	SCALE				
Forecasting	According to a recent projection by researchers at The National Institute of Mental Health, the number of marijuana users per 1000 people in most societies will be doubled between 1980 and 1990. How far are you sure that this projection is reliable?	Very Reliable 1 [ ]	Reliable 2 [ ]	Risky 3 [ ]	Not Reliable 4 [ ]	No idea 0 [ ]
Issue	Personal marijuana use must / does not need to be legalized {Circle one}. How important is this issue to others?	Very Reliable 1 [ ]	Reliable 2 [ ]	Risky 3 [ ]	Not Reliable 4 [ ]	No idea 0 [ ]
Objectives	One of the objectives of national policy is to increase public awareness of the differences between drug use (which is responsible) and drug use (which are not responsible). How far is this goal expected?	Very Reliable 1 [ ]	Reliable 2 [ ]	Risky 3 [ ]	Not Reliable 4 [ ]	No idea 0 [ ]
Selection	Some suggest that drug abuse education programs can reduce potential users in the general public. To what extent is this policy choice feasible?	Very Reliable 1 [ ]	Reliable 2 [ ]	Risky 3 [ ]	Not Reliable 4 [ ]	No idea 0 [ ]

Note: For more information, see Irene Ann Jillson, "The National Drug Abuse Delphi Policy: Progress Report and Findings to Date", in The Delphi Method: Techniques and Applications, ed. Harold A. Linstone and Murray Turrof (New York: Addison-Wesley, 1975), p. 124-59.

Table 2.   Hypothetical Responses to Delphi Policy of the First Round: Desirability
and Feasibility of the Purpose of Drug Control

Advocate	OBJECTIVE 2 (REDUCING SUPPLIES)		OBJECTIVE 2 (PUBLIC AWARENESS)	
	Purposes	Feasibility	Purposes	Feasibility
1	1	4	1	1
2	4	1	2	2
3	3	3	2	1
4	4	2	1	2
5	1	4	2	1
6	2	3	2	1
7	1	4	1	1
8	4	2	1	2
9	4	1	2	2
10	1	4	1	2
	Σ = 25,0	Σ = 28,0	Σ = 15,0	Σ = 15,0
	Md = 2,5	Md = 3,0	Md = 1,5	Md = 1,5
	Mn = 2,5	Mn = 2,8	Mn = 1,5	Mn = 1,5
	distance = 3,0	distance = 3,0	distance = 1,0	distance = 1,0

Note: Median (Md) on a set of scores is the value of the score in the center when the scores are arranged on the basis of magnitude. If the score is even (as above), the median is the score in the middle between the two middle scores. Median is usually used to replace mean (Mn) when we do not know whether intervals between sizes (for example, intervals between 1 and 2 and 3 and 4) are the same distance.

Note that the scale in Table 1 does not allow for a neutral answer, although the answer "No Opinion" is possible for each item. This limitation of neural responses is designed to deal with conflict and disagreement, an important goal of Delphi policy. An important part of making questionnaires is to do pretest among a sample of advice and determine the reliability of the response.

Step 4: Analysis of first-round results

When the questionnaire is returned to the analyst after the first round, the analyst tries to determine the initial position of advocates about forecasting issues, objectives, and choices specifically, some items that are believed to be desirable or important are also believed to be inappropriate, and vice versa. Because there will be differing opinions among the aforementioned advocate, it is important to use a measure that summarizes so that it does not only reveal the main tendency in a number of responses but also expresses the extent of differences or polarization. Measures that summarize this are used not only to eliminate unimportant, unwanted, inappropriate and/or uncertain questions but also to function in the

second round of questionnaires as a means to synchronize to participants the results of the first round.

The calculation and presentation of summarization measures from the main trends, dispersions, and polarization should be displayed in graphical form, to illustrate, it is assumed that ten advocates in the first round of Delphi policy hypothetics gave different opinions about the need and feasibility of two goals of drug control: to reduce the number of drug sales and to increase public attention to the difference between responsible and irresponsible drug use. Let us imagine that the response to this is shown in Table 2.

Note that some respondents (advocates 2, 8 and 9) believe that the goal of reducing illicit drug sales is not expected but it is possible to do or very feasible, while others (advocates 1, 5, 7 and 10) believe that this goal is very desirable but not very worthy. When we compare these inconsistencies between expectations and feasibility and responses to goal 2 (public attention), we find smaller inconsistencies in this second score. All of this states that the response to goal I, while lower in needs and feasibility, also reflects a kind of important conflict for

which Delphi policies are intended to overcome them. In this case, the analyst is not willing to delete this item. Instead, they will report this conflict as part of the second round of questionnaires, asking respondents to provide reasons, assumptions or arguments that make them have such a different position. Another way to deal with this disagreement is to compile and report a measure of average polarization, which can be defined as the absolute difference between scores for all combinations of respondents who answer a question.

Step 5: Development of subsequent questionnaires

The questionnaire must be remade for the second, third, fourth, or fifth round (most Delphi policies do three to five times). As mentioned earlier, the results of the previous rounds are used as the basis for the next questionnaire. One of the most important aspects of the Delphi policy takes place in the following rounds because advocates have the opportunity to know the results after a round is completed and explicitly submit reasons, assumptions, and arguments for their opinions. Note that the later rounds not only contain information about the main trends, dispersion and polarization; they also include a summary of the arguments offered for the most conflicting opinions. In this way, the Delphi policy provides a logical debate and maximizes the probability of loss of opinion and opinion on the basis of feelings. Before the last round of questionnaires was completed, all advocates had the opportunity to state their initial position regarding forecasting, issues, objectives, and choices; to test and evaluate the reason why their position is different from the other positions, and to re-evaluate and change their position.

Step 6: Organize group meetings

One of the last tasks is to bring advocates together to face-to-face to discuss the reasons, assumptions, and arguments that relate their positions. This face-to-face meeting, because it takes place after all advocates give birth to a contemplation of their own position and the position of others & can create an atmosphere that is full of confidence that cannot be realized in a committee. Face-to-face discussions also create conditions in which advocates can debate their position intensively and receive feedback directly and immediately.

Step 7: Preparation of final report

There is no guarantee that respondents will reach consensus, but it is reasonable to hope that creative ideas about issues, goals, choices and their consequences are the most important results of a Delphi policy. Thus, the final report must include a review of the various issues and choices that arise, and explain in what way all the conflict positions & underlying arguments. This report can then be submitted to policymakers, who use the results of the Delphi policy as one of the information sources in reaching a decision.

EXAMPLES OF DELPHI TECHNICAL

Case Example 1

The case example is the selection of small and medium-sized industries for SMEs to be developed to support Ecotourism in the West Lombok District of NTB Province, the type of agro-industry that has bright prospects to develop. In this case, there are four decision makers (PK) consisting of managers of business development, marketing managers, Tourism Experts, Ministry of Industry in NTB. and experts in the development of Small and Medium Business Schools. From the brainstorming process were obtained 16 alternatives and 3 criteria. Sixteenth alternative results of the brainstorming process, namely: (1) industrial dairy products; (2) cane sugar industry; (3) fish processing industry; (4) fruit processing industry; (5) oil palm industry; (6) animal livestock industry; (7) industrial tourism: entertainment, recreation, educational tourism, transportation tourism; (8) hospitality industry: type; (9) culinary Industry, restaurant; (10) industrial shoes, sandals, (male, female); (11) industrial clothing: clothes, gloves, jackets, pants; (12) clothing industry; (13) jewelry industry: necklaces, bracelets, rings, bross; (14) souvenir industry; (15) weaving industry; (16) batik industry.

Then each decision maker assesses the sixteen comprehensively with the method of valuation on a scale of 1 to 6. The preference values given by each decision maker towards alternatives can be seen in Table 3 and Table 4.

Table 3. Assessments Recapitulation by Decision Makers (PK)

Alternative	PK 1	PK 2	PK 3	PK 4	Average
Evaluation Round = 1
1	6	5	4	6	5,25
2	3	4	5	2	3,50
3	6	5	3	6	5,00
4	4	4	4	3	3,75
5	6	5	5	5	5,25
6	3	2	3	4	3,00
7	1	3	2	3	2,25
8	3	3	2	3	2,75
9	3	4	2	4	3,25
10	5	4	2	4	3,75
11	1	3	3	2	2,25
12	2	4	5	3	3,50
13	4	5	3	2	3,50
14	2	2	3	4	2,75
15	5	2	1	3	2,75
16	6	5	6	4	5,25

Table 4. Final Results of the Delphi Method

Alternative	Average
1	5
2	3
3	6
4	2
5	5
6	4
7	1
8	3
9	3
10	3
11	3
12	3
13	3
14	2
15	1
16	5

From the final results, the alternatives to be followed up are alternatives that have a high average value (5), namely alternatives 1, 3, 5 and 16 which are respectively: (1) dairy products industry; (2) fish processing industry; (3) oil palm industry; (4) timber industry

Case Example 2

In relation to the study of vocational career center (VCC) models, the Delphi technique is used to seek agreement or consensus from industry HRD managers, production managers, industrial networking organizations, labor development HR experts, and competency testing organizations. Focus group discussions (FGD) involved in supporting research (Priyanto, 2010) are as follows: (1) the industrial group consists of 13 machining industries in thr regions of Surabaya, Malang, Sidoarjo, Gresik, Madiun, and Bandung; (2) job market institutions are from the East Java Industrial Network Forum; (3) quality assurance institution from Global Mandiri competency test at PT. PAL Surabaya; (4) educational institutions from the UPT Vocational Education Training and Development (PPPK) East Java Provincial Education Office.

The results taken from the agreement or consensus focus group discussion are to examine and decide on various matters related to research problems, namely: (1) make changes and improvements to the curriculum in VCC learning on curricula that have been tested in a limited manner. The results of the consensus are attached; (2) conducting preparation and refinement of competency evaluation instruments at the end of the work internship with VCC learning. The results of the consensus are attached.

In more detail, the results of the consensus of the VCC learning model can be seen in Table 5, 6, & 7.

Table 5. Participants in the FGD OF VCC Learning Model

No	Institusion	position	PIC
1	PT. INKA Madiun (Industri Kereta Api)	Manager HRD	Ibu Wiwi
2	PT. Tjokro Kemayoran, Surabaya (Industri Permesinan)	Manager HRD	Ibu Nur
3	PT. Bersaudara Heavy Duty, Surabaya (Industri Permesinan)	Manager Produksi	Bapak Eka
4	PT. Dempo Laser Indo, Surabaya (Industri Permesinan/Laser Cutting	Manager HRD	Bapak Dwi Supriyanto
5	PT. Berkah Alloy, Sidoarjo (Industri Pengecoran)	Manager Produksi	Bapak Yanto
6	PT. Puspetindo, Gresik (Industri Permesinan)	Vice President	Bapak Busmin Napitupulu
7	PT. Teknik Indo, Malang (Industri Permesinan)	Manager Produksi	Bapak Yosep
8	PT. Adi Lestari CNC Teknik, Bandung (Industri Permesinan/Plat	Direktur Produksi	Bapak Sugihartono
9	PT. Artawena, Malang (Industri Permesinan/Plat	Manager HRD	Bapak Musyafak
10	PT. PAL Indonesia, Surabaya (Industri Kapal)	Wakil Direktur TUK	Bapak Siswanto
11	PT. CORIN, Sidoarjo (Industri Permesinan)	Manager Produksi	Bapak Nani
12	PT. SUN PACK, Sidoarjo (Industri Permesinan)	Manager Produksi	Bapak Imam
13	Forum Jejaring Industri Propinsi Jawa Timur (Tempat Diklat Tenaga Kerja Industri)	Ketua Forum	Bapak Iksir

Table 6. Changes and Improvements to the Curriculum on the Implementation of the VCC Learning Model of the OJT Place Industry

No	Recommended Changes	Realization of Implementation in Learning	Recommending Industry
1	- Effective 4 months training time - The need for guidance material for mental, physical and disciplinary so that students are able to work in the industry	The planned training for 2 months is still carried out 4 months. Bintal learning is a combination of civilian and military.	PT. Puspetindo, Gresik
2	- Need graduates who have a work ethic and time discipline	Changes from conventional attendance devices (initial attendance) to the use of CHECK CLOCK attendance devices and apply compensation times	PT. Bengkel Bersaudara Heavy Duty, Surabaya
3	- The need for electrical material - Effective 4 months training time	Addition to learning material of basic electricity	PT. Tjokro Kemayoran, Surabaya
4	- Effective 4 months training time - 3 months work internship - If training is only 2 months, training participants lack skills and work attitudes	Changes in allocations of training and industry internships	PT. Teknik Indo, Malang
5	- Minimum height of training participant is as high as machine (min. 160 cm)	Determination of a prerequisite for prospective trainees	PT. Dempo Laser Indo, Surabaya
6	- Ability to Sketch image - The time of training and apprenticeship is in accordance with the competencies requested by the industry	Addition of basic drawing learning material, then CAM Master	PT. Berkah Alloy, Sidoarjo
7	- The need for mental and physical readiness in working optimally	Improved Bintal learning	PT. Adi Lestari CNC Teknik, Cimahi, Bandung
8	- Ability to read pictures and use the right measuring instruments.	Strengthening learning material of Industrial Metrology	PT. Artawena, Malang
9	- The need for adequate production technical capabilities	Strengthening learning for project work models	PT. CORIN, Sidoarjo

Table 7. Agreed Material in Training and internship in the VCC Learning Model Based on the Results of ExpertJudgement Consensus

No	training and internshipmaterials
1	Physical and Mental Development Material
2	Physical Education Material
3	Mathematics Learning Material
4	English Language Learning Material
5	Work Bench Learning Material
6	Lathe Machine Learning Material
7	Milling Machine Learning Material
8	Engineering Drawing Learning Material
9	Metal Working Engineering Learning Materials
10	Measurement Learning Material
11	Electricity Learning Material
12	CNC Machining Learning Material

CONCLUSION

The Delphi evaluation technique is one of the tools of evaluation techniques used in evaluation techniques with theoretical decision approaches. While theoretical decision theory is an approach that uses descriptive methods to produce accountable and valid information about policy outcomes that are explicitly assessed by various types of policy actors. The main difference between theoretical decisions on the one hand, and quasi-evaluations and formal evaluations on the other, is that theoretical decision evaluation seeks to elicit and make explicit the goals and targets of policy actors whether hidden or stated. This means that the goals and targets of policymakers and administrators are one source of value because all parties who have a stake in formulating and implementing policies are involved in formulating objectives and targets where the performance will be measured.

The Delphi theory is very good for solving general problems, where the policy plan is closely related to certain field experts (Ario, 2010) because each expert in a particular field will be able to issue his aspirations that have abilities in terms of which they are involved. In addition, this method does not pay attention to the name of the expert to prevent a large influence of one member towards the other members, and each respondent has sufficient time to consider each part and if necessary see the information needed to fill out the

questionnaire so as to avoid pressure social psychology (Susanto, 2011).

However, the Delphi technique also has a number of drawbacks that must also be considered, namely the time spent in filling out the questionnaire will be quite long, because this method uses the opinions of experts who are different aspects, it is feared will represent opinions that cannot be scientifically maintained and tend to think only from the aspect that is best for him (Putuwindra, 2012).

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