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LESSON STUDY IN COMPETENCE DEVELOPMENT OF ACCOUNTING TEACHERS

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Abstract

This research aimed to find out and explore the lesson study practice in developing the accounting teacher's professionalism. This research employed qualitative research using a single instrumental case-study strategy. The data were collected using in-depth interview, observation, and documentation. Then, they were analysed using interactive model. The results of the research showed that with the implementation of the lesson study in schools, it succeeded in improving the four teachers' competencies. The improvement of the pedagogical competence can be seen from the well preparation of learning, the selection of teaching strategies according to the characteristics of the students and the implementation of memorable learning for the students. Professional competence can also be seen from the teacher's preparation in choosing relevant and up-to-date materials, teaching them by connecting to daily practice and always evaluating the material taught to maintain the quality of the material. The improvement of the social competence can be seen from the more effective communication between the teachers and students and their colleagues. The improvement of the personality competence is indicated by the teachers' attitudes that are increasingly wise and prestigious in responding to the conditions related to their work. The research implication is that the practice of lesson study can form accounting teacher learning groups that serve as a place for sharing and discussion in developing their professionalism.

Keywords: *lesson study, teacher competence, learning community*

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INTRODUCTION

Lesson study has been implemented for a long time and is said to be one of the keys to the success of education in Japan more than a century. It has been practised for many years in the country as a part of full education (Fang, Lee, & Yang, 2012, p. 66; Lewis & Tsuchida, 1998, p. 16; Wang & Paine, 2003, p. 75).

Lesson study has been used as a model in implementing the curriculum, analysing curriculum structure, helping teachers in connecting learning concepts and difficulties, and analysing the t0065aching materials used. The application of lesson study in the classroom learning practice also helps teachers in designing learning strategies in great detail. The design process is structured together so as to bring about a good process of interaction among teachers in schools (Tan-Chia, Fang, & Chew Ang, 2013, p. 257).

The success of lesson study has been proven and practised in education in several countries. In the United States, it is used to develop the pedagogical competencies of mathematics teachers (Lewis, Perry, & Murata, 2006, p. 4). In Singapore, the use of lesson study is more focused on improving teaching strategies for English subject (Lewis et al., 2006, p. 4; Tan-Chia et al., 2013, p. 257). In China and Hong Kong, lesson study is used officially pioneered by the government to test the curriculum, conduct classroom learning, and provide feedback on national curriculum and policy (Fang et al., 2012, p. 66; Tan-Chia et al., 2013, p. 257; Wang & Paine, 2003, p. 93).

The lesson study model has also provided several innovations that influence the world of education throughout the world. In learning activities, the use of lesson study provides an effective teaching experience, bridges teachers in linking theory and practice, and has a positive effect on students' learning achievement. This model can also foster a culture of mutual trust and support among fellow teachers in schools to collaborate to form learning communities. Lesson study is one of the recommendations of an innovative model in the teachers' ongoing professional development (Lewis, 2005, p. 83; Lo & Tang, 2009, p. 13; Y. Zhang, 2014, p. 9). In curriculum development activities, lesson study can be used to test the curriculum, look for existing shortcomings, and allow the use of the model for schools and teachers to develop a school-based curriculum (Y. Zhang, 2014, p. 8).

During this time, the success of lesson study in making improvements and innovations in the curriculum, developing teacher competencies, and making innovations in lesson and learning is still dominated by linguistics, mathematics, and science (Tan-Chia et al., 2013, p. 258), and so is it in Indonesia. Only in the last few years has lesson study begun to be developed in other fields of science, one of which is accounting.

Lesson study research on accounting is a new research, and few researchers have examined the topic. Another reason that makes the researchers more interested in researching this topic is because of the difference in science and countries of the previous research. As mentioned above, lesson study has succeeded in improving the teaching of teachers of linguistics, mathematics, and science overseas. Furthermore, the researchers were curious about whether this would be the same if applied to the accounting learning in this country. More broadly, can lesson study develop the overall competence of the accounting teachers not only in teaching (pedagogic competence), but also in the other competencies. These questions increasingly lead to the high curiosity of the researchers

In addition, the issue of teacher professionalism begins to be lifted on the surface now. The community is more concerned about the teacher's performance in teaching at school. They are increasingly serious in looking at the teachers' teaching practices and increasingly vocal in voicing the findings of the teacher unprofessionalism.

Pedagogical competence is an important competency for a teacher. This competence makes the difference between the teaching profession and other professions. Hendayana (2007, p. 6) explained that pedagogical competence is the ability of a teacher to manage learning in the classroom, from preparing learning instruments, implementing learning, and evaluating learning.

Pedagogical competence refers to the performance, knowledge, and skills in teaching, thus covering the ability of teachers to manage the teaching and learning process from planning to the evaluation stage. The quality of teaching relates to teacher's pedagogical knowledge, which includes knowledge of students'

abilities, effective teaching, and how students learn (Shulman, 1987, p. 3).

The pedagogical competence of teachers can be developed and improved through the application of lesson study. Trapero & Gómez (2017, pp. 75–79) stated that when teachers work together in analysing teaching practices they did, they work collectively and collaboratively to find out what works and what doesn't in learning. The results are used to make up alternative learning improvements and are repractised. This method can build a learning culture through experiences experienced by the teachers. As a result, teacher confidence changed. Changes in teaching practices that are less appropriate and tend to be traditional are gradually disappearing. Teachers tend to pay more attention to effective teaching methods for use in teaching students.

The subsequent competence that support the teacher in guaranteeing the material conveyed in teaching in accordance with current needs is professional competence. The Government Regulation of the Republic of Indonesia Number 19 Year 2005 article 28 paragraph 3 point c (Presiden Republik Indonesia, 2005) stated that professional competence is the ability of the teacher in mastering the learning material widely and in depth so as to guide the students to obtain predetermined competency standards.

The ability of teachers to master the material is the main point of professional competence. The mastery of the material includes subject mastery taught at school, the mastery of scientific substances that covers the material being taught, and the mastery of the scientific structure and methodology (Kunandar, 2009, p. 77; Zulfija, Indira, & Elmira, 2013, p. 549). The teacher in giving the subject matter must always use the latest material (up to date) because naturally the subject matter always evolves and dynamically follows the development of the current science and technology.

Lesson study as a model for teacher professionalism development can also be used to develop teacher's professional competence. (Hakim, 2015, pp. 11–12) stated that the use of lesson study in the development of teacher's professional competencies is reflected in the level of understanding of teaching materials, the ability to understand concepts and their interconnectedness with other sciences, the mastery of steps in research, and the critical analysis to explore teaching materials and to find a solution.

The social and personal competencies are two competencies that complement the two previous competencies. Teachers are part of the school, making them have to be able to interact in it. As individual beings, they must also show good attitudes and be accepted in the school community. Therefore, the social and personal competencies are believed to be the teacher's emotional intelligence. The intelligence helps their internal aspect to get along in the school community.

The Republic of Indonesia Government Regulation Number 19 of 2005 concerning the national education standards article 28 paragraph 3 point b and d (Presiden Republik Indonesia, 2005) explains the two competencies. First, social competence is the ability of teachers to communicate and interact effectively with their students and colleagues. Second, personal competence is the ability of the teacher to be a person who has wisdom and prestige.

In the previous studies, there were still few researchers who linked the lesson study with the development of the social and personal competencies, but did not rule out the possibility that these competencies could be developed with the lesson study model. The process in the lesson study cycle provides many opportunities for teachers to interact. In order for the interaction process to work well, the teacher must be able to communicate well with each other and show a good personal attitude as well.

In the learning process, the process of interaction with the students also occurs. It also trains the teachers to be able to communicate well with them so that the learning process can run smoothly. Likewise, teachers must be able to show good attitude and role models for their students. Therefore, it is very possible that both teacher competencies can be developed during the lesson study activities. In addition, this can also be a new research finding for the researchers.

Based on some of the above, the research was deliberately carried out to find out and explore the lesson study practices in developing the accounting teachers' professionalism.

RESEARCH METHOD

This reseach was a qualitative research using a single instrumental case study, which

studies in depth the phenomenon of a particular case focused on one issue or topic (Creswell, 2013, p. 139; Moleong, 2017, p. 6). This type of research is considered to be in accordance with the research topic because it can parse and describe the case study that exists in the research object comprehensively (Zhang, 2015, p. 143).

This research was conducted in one of the schools which became the pilot project for the implementation of a special lesson study at the first vocational high school in Yogyakarta, Indonesia with accounting skill program, Indonesia, namely Muhammadiyah Vocational High School Wonosari. This research was conducted from January to June 2018.

Lesson study is said to be a model for the teacher professionalism development. The model has three stages, namely the plan, do and see stages. These three stages are intended to foster teacher professionalism to create better teaching and learning activities. The lesson study activity was carried out in collaboration between a group of teachers, experts/practitioners and school parties related to applying the principles of mutual learning (Abizar, 2017, p. 55; Winarsih & Mulyani, 2012, p. 44).

The teacher acts as the subject who carries out the model. The experts/practitioners act as the program facilitators from universities. The school, in this case the principal and the the vice principal of the curriculum, play a role as the party who makes policy and cooperates with the university.

Teachers are said to be professional if they master 4 teacher competencies, namely pedagogical, professional, social and personal competencies. The indicator of the pedagogical competence is that teachers are able to understand their students in depth, design and apply learning, and design and carry out learning evaluations. The indicator of the professional competence is that teachers have the knowledge related to the field of study taught and the structure and scientific method of the field of study. The indicator of the social competence is that teachers are able to communicate effectively with the participants, and with their colleagues. The indicator of personal competence is that teachers are able to show wisdom and prestige.

The data were collected using documentation on secondary data sourced from written documents and audiovisual materials; non-participant observation which places the researcher as an outsider from the group being studied, watches and makes field notes and recording; and deep interview to informants (Creswell, 2013, pp. 231–232; Emzir, 2010, p. 40).

In qualitative research, researchers are the main research instrument (Sugiyono, 2015, p. 305). The three instruments above were deliberately made by the researchers to facilitate the data collection process. Then, the researchers validated the instrument to the expert appraisal so that the instrument used was appropriate to collect the data. The research subjects were the principal, the vice principal of the curriculum field, the head of the accounting department, accounting teachers and students majoring in accounting.

After all the data were collected, they were tested for validity. The purpose of this test is to see the validity of the research data, so that the data obtained are not defective or invalid (Gunawan, 2015, p. 219; Moleong, 2017, p. 330). The data validity test technique used was source triangulation technique. This technique is the most appropriate because the data were obtained from a variety of different sources.

The data were then analysed using interactive model developed by Miles and Huberman. The distinctive feature of this model is that each stage is flexible that the collected data can represent and answer all research objectives. The Miles and Huberman model has four stages: data collection, data reduction, data display, and conclusion drawing/verification (Miles & Huberman, 2007, pp. 139–140).

RESEARCH RESULTS AND DISCUSSION

The application of lesson study to accounting teachers at Muhammadiyah Vocational High School Wonosari began in the 2012/ 2013 academic year. The practice of lesson study on accounting was not different from that on linguistics, mathematics, and science that have been applied previously. Lesson study was implemented through three stages, namely plan, do, and see.

In this research, the development of teacher competence was traced to the daily practices of teachers in the school. The description of this competency development is outlined in each stage of the lesson study cycle.

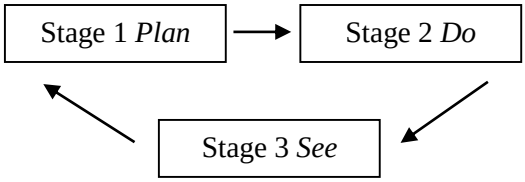

Figure 1. Lesson Study Cycle (Aimah, Ifadah, & Bharati, 2017, p. 69)

Lesson Study Practices in the Development of Accounting Teachers' Pedagogical Competencies

In daily practice at school, lesson study provides an opportunity for teachers to develop and improve the pedagogical competencies of accounting teachers. The teachers formed a team to work together in analysing, preparing, and implementing effective learning for students. The team formed by the school was a team consisting of teachers who supervised the same subjects or those who taught at the same class level. The reason is to make it easier to establish communication and facilitate exchanging relevant pedagogical information. Based on the findings in the field, the development of pedagogical competencies was seen at each stage in the lesson study cycle.

In the plan phase, the teachers worked together in preparing the right lesson plan to be used in the classroom learning process. During this activity, they had the opportunity to develop pedagogical competencies seen in several findings. First, before learning was done, they exchanged information and experiences about the state of the students, their abilities, and the ways or strategies of learning carried out so far in a class. The results of the information exchange would then help the teachers in determining the right strategy to be applied to the class they taught.

Second, before learning, they made a minimum limit of competency for each material. The minimum competency limit for each material was arranged differently according to the characteristics of the material. Even though the KKM (Minimum Mastery Criteria) from the school has been determined, it was still redetermined so that the value of students varies and helps each other at the final grade. The process of preparing the KKM was also carried out jointly and by mutual sharing among teachers so that the KKM value determined is appropriate and representative of the material in question.

Third, the teachers made teaching materials in the form of material summaries and practicum sheets. The preparation of this teaching material was undertaken because there was no book or module given by the government, so the teachers must make their own teaching materials. It is also in line with what is mandated by the 2013 curriculum that teachers can creatively make their own teaching materials according to their needs. Based on these circumstances, the accounting teachers made teaching materials independently and collaboratively among teachers who teach the same subject.

Surono & Wagiran (2016, p. 99) stated that as an ideal teacher, in carrying out his professional duties, a teacher's pedagogical competence must be maintained because overall the competencies fall into an important category and are very important in their research. The teachers' abilities to understand the characteristics of the students, master the learning model, and make up learning designs are some of the teachers' competencies before learning that must be prepared.

Lesson study can bridge this because through which the teacher is facilitated in preparing it. The teachers' works feel light because of the division of works and duties in carrying it out among them. The three findings above show the teachers' efforts to improve and develop their pedagogical competencies in prelearning activities.

Then at the do stage, the teachers' focus was to develop their ability to teach in class. An interesting finding in this study was the teacher's strategy in teaching.

> *We see the students' intakes. In general, their intakes are still relatively low, so we as teachers must be diligent, patient, and really guide them. It must be done repeatedly. The point is that it must be done continuously (Interview with Dwi Handriyani, accounting teacher, 2018).*

The key to accounting teachers in teaching is patience to students. This is because the students' intakes in the accounting department were still relatively low. However, the teachers must create effective learning so that the teacher functions more as a facilitator and mentor to the students in the class. The teachers' teaching

strategy was by assisting their students individually so that their learning difficulties can be identified more quickly and the teachers understand their students' wants and needs. In order for the strategy to work well, the teachers also utilized peer learning.

The use of such teaching strategy was considered to be more effective and made it easier for the students to understand the material being taught. This is also supported by Syahruddin et al. (2013, p. 214) which stated that a teacher should do teaching and learning activities in accordance with the students' learning styles and prior knowledge or the previous intakes so that learning can run better and be memorable for the students.

The method that is often done by the teachers in teaching to involve students in learning is by utilizing the existence of teaching materials in the form of practicum books. The availability of the practicum book made learning livelier because the students were actively involved in completing the practicum questions given. In the learning, the main facilitator is the teacher concerned. The students who already understood and mastered the material also helped the others who got difficulties. This method makes learning livelier because there is a two-way relationship between students and teachers, and the collaboration between them occurs.

The use of lesson study practiced in the daily pedagogical activities of teachers has resulted in changes in the teachers' mindset. The teachers who initially taught in class using traditional learning method that tend to be stilted, hard and teacher oriented turned into those using modern learning method. Now in learning, the teachers tend to be more lenient with their students. They followed the development of the students. They also adjusted to their environment by positioning as parents, siblings, or even as friends but there were still limitations. The goal is that the students will be more open and willing to express the obstacles they face during the learning process, so that learning can run better.

This is in line with the research of Trapero & Gómez (2017, p. 79) which examines lesson study on Mathematics teachers in the USA. The findings of their research stated that the use of lesson study can change teacher's beliefs. Changes in teaching practices that are less appropriate and tend to be traditional are gradually disappearing. The teachers tend to pay more attention to effective teaching methods to be used in teaching students.

For students, the application of lesson study in learning also benefits them. They get an impressive learning experience. The teachers explained the lesson in detail and step by step slowly and patiently. The students were also required to concentrate on learning because sometimes the teacher gave sudden questions. They also sometimes gave interludes with stories of motivation and jokes in teaching so learning is not boring and not stilted.

As the professional teachers, they must understand and apply quality learning. In teaching practices, they must be able to make learning interesting and meaningful for students. The application helps students to gain knowledge and memorable learning experiences for them. If this can be done, the learning process can be said to be successful (Waluyanti & Sofyan, 2018, p. 101).

At the see stage, the teachers tend to discuss and share about the findings in teaching and the learning problems that occurred. In order for the process to work properly, the school facilitated the teachers by arranging seats in the teacher's room in groups according to the same skill programs. This made it easier for the teachers to continue to meet and gather without being far apart.

> *Indeed, we did the evaluation activities in a non-formal atmosphere. The seats were close together. it was easy for us to talk to each other and argue and respond. The activities of exchanging information, talking about student development, and chatting with others were effective (Interview with Dwi Yuli Musi Rahayu, teacher accounting, 2018).*

The finding at this stage was that the teachers talked to each other about the appropriate learning strategies for a particular class, discussed the results of students' learning evaluations, and looked for solutions to the problems that occurred in learning. Another interesting finding was also found that one and another teacher helped each other. This can be seen from the junior teachers who were always guided by the senior teachers regarding appropriate teaching methods in schools, how to deal with students, and other teaching experiences. Meanwhile the senior teachers received a lot of

inputs from the juniors regarding the latest developments in accounting science, curriculum development, technology, and others.

The collaboration indirectly forms learning communities among themselves. This learning community is used as a place for teachers to share with others and help each other in the learning process. The existence of this community further strengthens them in cooperation and team work in working so that the work will get lighter, and the results are more optimal.

Doig & Groves (2011, p. 93) and Herawati (2009, p. 2) stated that in the long run the application of lesson study had an effect on teachers on their own initiative to meet again. The meeting was used as a place for discussion about learning. The teachers shared information and worked collaboratively in preparing the right lesson plan and evaluating to get the ideal teaching model for certain subject matter.

Lesson Study in the Development of Accounting Teachers' Professional Competencies

Teachers have a very large mandate to always provide qualified services and education to students. Therefore, they must always improve their professionalism in working by developing their competencies (Munawar, 2011, p. 171). In order for the quality of learning to be maintained, the material delivered to students must also be of high quality. The characteristics of quality material are relevant and up to date with the development of its science. Lesson study can be one of the models that bridge this.

The ability of teachers to make up and provide quality material to students is professional competence. The main key of this competence is the mastery of the material delivered in learning. Mastery of the material includes mastery of subjects taught in the classroom and mastery of scientific substances that cover the taught material (Kunandar, 2009, p. 77; Zulfija et al., 2013, p. 549).

The practice of lesson study in schools is also aimed at developing the professional competence of accounting teachers. These competencies are considered important and support each other with pedagogical competence. After a teacher has conducted good teaching practice to students, there must be certainty that the material taught is also relevant and up to date. Therefore, the school continues to improve these competencies. In practice, the development of professional competence can also be observed in each stage of the lesson study cycle.

In the plan phase, the teacher made up the material in accordance with the curriculum. Material preparation was conducted by discussing among fellow teachers. The teachers who taught the same subjects shared the task of finding relevant and up-to-date materials from various sources. The sources that are often used are books, internet, and the materials from the discussion results of MGMP (Teacher Woking Group). The material search results were then discussed together and agreed upon what materials would be taught the following year. It is possible that in the middle of the discussion, there will also be revisions to the material taught if there are additional or recent material changes.

The school makes the rules by dividing the same subjects to be taught by more than one teacher to foster team work among fellow teachers. The goal is very supportive with the implementation of the lesson study that is being carried out because it enlarges the collaboration and intensive interaction among teachers. The rules prepared by the school above are in line with Hadiprayitno's (2016, p. 316) opinion which stated that in supporting and encouraging teachers to always develop their competencies, the principal can make rules for teachers to work in teams and allow regular discussions with peers or other forms that can facilitate them.

In the do phase, the development of teachers' professional competencies was seen in the learning process in the classroom. The teacher delivered the materials related to everyday life. In addition, they gave the benefits gained from studying the science and exemplified job vacancies for accounting graduates.

> *Teachers in teaching sometimes provide examples in everyday life. The example is about transaction. What do we buy at a store? Then, how to record it? Besides that, it was also exemplified that after graduation we could work in a bank, as a cashier, or in a cooperative (Interview with Alifah Nur Setyani, Student of Accounting, 2018).*

Rusman (2009, p. 233) and Danim (2010, p. 23) also explained similar things. One of the indicators of the teacher who has professional competence is the ability of the teacher to connect the concept of material taught with daily life that the students understand the purpose of their learning the material.

In the see stage, the finding that stands out is the use the study group as a place to share information and to discuss the development of material in accounting subjects and the selection of materials to be taught in the new subjects of the 2013 curriculum. The collaboration among teachers seems to be done in preparing and evaluating some of the activities above. This is evidenced by the frequency of the teachers' meeting and discussion in their leisure time. In addition to the discussion about subject matter, the study groups were also used to share information about the teaching profession, especially in preparing UKG (Teacher Competency Test) held by the government.

The Development of Accounting Teachers' Social Competencies during Lesson Study Practices

The practice of lesson study has proven to be able to improve teachers' social competencies. It can be seen from their ability to establish effective communication among them and between them and their students. According to Tubbs & Moss (2005, p. 69), communication is said to be effective if the message conveyed by the communicator to the communicant can be conveyed properly. The message must also be understood according to what the communicator wants.

First, effective communication is built among teachers. This is evidenced by two research findings. (1). In the plan and see stages, their communication was well built and ran effectively in preparing and evaluating learning. They often met, shared and discussed to each other. The process trains the teachers to express opinions, speak effectively, and prepare the right words to use in communicating so as not to offend other teachers and communicate the message perfectly.

(2). The existence of effective communication, also builds close family relationships among the teachers. It can be evidenced from the smooth communication, lack of awkwardness, and jokes when they gathered. Proximity was also seen between senior and junior teachers. They did not discriminate status, and they could even cooperate with each other.

An effective communication process must be able to deliver the message properly to the communicant. The message information also benefits them. In an intense process, communication is also able to improve close relations between the two parties because they can choose the right words and do not hurt the other person. Therefore, the benefits of effective communication are broad (Arsjad & Mukti, 2005, p. 18; Tubbs & Moss, 2005, p. 69).

Second, effective communication was also built between the teachers and students. This is evidenced by two findings. (1). The teachers are able to make learning run in two directions. The students were given the freedom to communicate in class. They are free to express opinions, ask questions, and even allowed to discuss during the learning process. The teachers were no longer the only source of sound in learning, but the students were also given the freedom to speak.

(2). The teachers are able to convey the contents of the message in the communication to their students well. This can be seen from the way they teach that always emphasizes the important things/core of the material being taught. This method that facilitates the contents of the message can be conveyed properly. Besides that, the teachers also always made notes on it that the students received verbal and non-verbal communication.

The Teacher's Personal Competencies Seen in the Lesson Study Activities

There are two characteristics that appear in the observations of the researchers during the lesson study practice of the teachers; they are wisdom and prestige. Both of these traits can be developed well, so that they can impact on their personal manifestations to become even stronger.

First, the teachers show wisdom. This is seen at all stages in the lesson study cycle. (1). They are able to show an open attitude in thinking. They are willing to receive inputs from other teachers and accept new things. (2). The teachers show their usefulness in learning for the students. The teachers' coming to the class gives a great effect for students. Besides getting additional knowledge, they also get character guidance and mentoring on it.

Second, the teachers show the prestige. This can be seen from the students' attitudes who respect them inside and outside the class. In the classroom, the students paid attention to the lessons and were cooperative. Outside the classroom, they also greeted their teacher. This condition occurs because of the personality of the teacher himself. The students will naturally respect the teacher because he also respects them as students and treats them as his own children.

Samani & Hariyanto (2012, p. 128) argued that respect is an attitude that values oneself, others and the environment. Treating others like their desires to be respected, civilized, polite, and not insulting. The fact that the teachers are respected by their students shows that it is the behaviour that makes students appreciate their teacher because basically people will respect others if they themselves want to respect other people too.

CONCLUSION

Based on the explanation, conclusions that can be drawn are as follows: First, the practice of lesson study succeeded in developing pedagogical competencies. This can be seen from the success of the teacher in compiling, implementing and evaluating their teach-ing. Second, teachers' professional competencies can also be maintained and developed. This happens because of the cooperation and team work among teachers to always update the materials and teach them to their students by connecting theory to everyday life. Third, teachers' social competence can be developed well with the establishment of effective communication with their colleagues and between the teachers and students. Fourth, teacher's personal competencies can be seen from the observation of the researchers. They show wisdom and prestige in working.

The implication of the application of lesson study is the formation of study groups which are used as a place for sharing and discussion about accounting lesson and learning. Suggestions and recommendations that can be given are as follows: First, the next researchers can increase the research of lesson study in the social sciences. Second, other schools can follow the sample school that becomes the pilot project for the implementation of lesson study so that teachers can learn together in developing their professional competencies. Third, government can use lesson study to apply new policies made on national lessons and learning.

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EVALUATION OF FINANCIAL MANAGEMENT PATTERN OF THE PRODUCTION UNIT IN REFERRAL VOCATIONAL SCHOOL WITH ADVERSARY MODEL IN YOGYAKARTA SPECIAL REGION

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Abstract

This study aims to determine the effectiveness of the implementation of Referral Vocational School (SMK Rujukan) program in financial management of production units in the DI. Yogyakarta province. This research was an evaluative research which described problem of financial management of production unit at SMK Rujukan. The approach used of this research were mixed methods which combined quantitative and qualitative research. The evaluation model of this research were an adversary model. An adversary evaluation model were an evaluation that seeked to uncover all the important aspects of the program being evaluated. The results showed that of the 5 SMK studied, there is only 1 SMK that had adequate financial management system of production unit, while 4 other SMK not yet adequated. Forms of protection to financial management of production units for SMK in the DI. Yogyakarta province had not been established yet. No school of the 5 schools studied, had implemented a pattern of financial management in accordance with applicable regulations.

Keywords: *financial management pattern, production unit, referral Vocational School*

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INTRODUCTION

Vocational education as education designed to develop skills, abilities, understanding, attitudes and work habits and appreciation needed by workers to enter and make progress in work based on benefits and productivity. Thompson (1973, p. 111) stated that the American Vocational Association defined vocational education as "*Vocational education as education designed to developed skills, abilities, understandings, attitudes, work habits, and appreciations needed by workers to enter and make progress in employment on useful and productive basis"* Vocational education not only touch skills, abilities, and understanding, but vocational education must also instill values in shaping attitudes, work habits, and appreciation for students, so that students can be productive and beneficial for themselves and their environment.

According to Mumpuni & Widarto (2011) Mila Mumpuni and Widarto (2011) about the importance of managing production units were:

> *"In the Guidelines for Implementation the Production Units of Vocational High School, Production Units was formed strongly associated with three aspects are academic, economic, and social. Academic aspects of the implementation the Production Units of Vocational High School related with the process of teaching and learning in schools. The economic aspects, Production Units dispose to make financial resources for finance education and improve the welfare of citizens of the school. While the social aspect is expected the Production Units can realize the main task of the intellectual life of the nation's education and to character building with an entrepreneurship."*

Based on this opinion the Production Unit was formed in three interrelated aspects, namely academic, economic and social. The implementation of the SMK production unit from the academic aspect is related to the teaching and learning process in schools. From an economic aspect, production units can become financial resources for financing education and improving the welfare of school citizens. Whereas from the social aspect, it is expected that the production unit can realize the main task of intellectual life of national education and build character with entrepreneurship.

Referral Vocational School (SMK Rujukan) were one of the Ministry of Education and Culture contained in the 2015-2019 Directorate of Vocational Development Strategic Plans. The definition of Referral Vocational School in the 2015-2019 Directorate of Vocational Development in the Strategic Plan (Direktorat Pembinaan SMK, 2015) is a superior vocational school in various aspects, so that it can be used as a reference for other SMKs. Some of the problems experienced by Vocational Schools that had the potential to become Referral Vocational Schools were, among others, inconsistencies between programs that became performance indicators for Referral Vocational Schools and the prevailing laws and regulations such as regulations on financial management of state revenues from the use of state facilities. One of the pros and cons that arised is the management pattern.

In the provision stated that products or services produced by government institutions that utilize state assets must be deposited in the state treasury. However, in its implementation, the current provisions had not specifically regulated the pattern of financial management in State-Owned Referral Vocational Schools, so that the development of production units which were the prerequisites for vocational education in general and Referral Vocational Schools in particular did not run optimally. Some Referral Vocational Schools had good and marketable product potential, but were not marketed, because the regulations were not clearly yet. Based on these considerations, it is necessary to evaluate the implementation of the Referral Vocational Program in the financial management pattern of the production unit with the adversary model, so that it could provide recommendations for future policy making of the Referral Vocational Program.

Another study about The Management Of Production Unit Of Vocational High School In The Field Of Building Program In Special Region Of Yogyakarta (A Case Study Of SMKN 2 Pengasih Kulonprogo) according to Gunadi & Usman (2015) had a conclusion as follows:

> *the planning has not been implemented optimally; the obstacles in the planning, i.e. the absence of regular meetings, spe-*

cifically those discussing and the lack of documentations; not all the managers are involved; the organizing involves the distribution of the tasks, the delegation of tasks and authorities, as well as coordination; the obstacles in the personnel, inadequate facilities and infrastructure as well as the coordination; the implementation measures indicate the implementation functions applied are more like the implementation of the production process; the production unit has not functioned properly as a educational tool; the implementation is constrained by the workshop which also becomes a practicum place; the steps and the principles of supervision are only applied in terms of financial statements; the parties supervising the UPJ are the managers of the school UPJ, the managers of the department UPJ, and the head of the workshop; the supervision is constrained to the absence of SOP.

Based on these studies it can be concluded that the management of production units in SMKs had not run optimally because various factors, including planning, financial management, supervision, and SOP were not run properly and not available yet.

The purpose of this study was to determine the profile of Referral Vocational Schools which became a prerequisite for Referral Vocational School indicators which included the number of students, infrastructure facilities, vocational management, and entrepreneurship-based learning. In the other side the purpose of this study was to find out the financial management of production units indicators which included the availability of legal protection, planning, governance and evaluation. SMK Rujukan that manages the production unit was said to be effective if it meets the indicator.

RESEARCH METHODS

This research was an evaluative study that described the problem of financial management of production units in SMK Rujukan. The evaluation model used in this study was the adversary model. The adversary evaluation model was an evaluation that seeked to reveal all important aspects of the program being evaluated.

Wolf (Stufflebeam & Shinkfield, 1985, p. 266) stated that: "Basically, the approach involves the dialetic and legal processes. It attempts to examine openly issues surrounding a pro-position by presentation of cases for and against the proposition. The purpose is clarify. With proceedings completed, and the many facets surrounding the object of the evaluation illuminated, decision makers have sufficient, sound evidence to make rational decisions.

Basically, evaluation with this approach involved dialectics and legal/legal processes. This approach seeked to openly explain the issues that occur in a case proposition, where there were differences of opinion between the two parties. With a complete process, and many sides surrounding the illuminated evaluation object, the decision maker could make rational decisions and be accepted by both parties with sufficient evidence.

Production unit management was one form of entrepreneurial learning which is one of the preconditions for Referral Vocational Schools. The management of the production unit had not been able to run optimally, because it did not have a legal protection and a pattern that was in accordance with the current conditions of SMK yet.

The approach used in this study was a mixed approach with sequential explanatory that combined quantitative and qualitative research. The first stage of this evaluation were collect and analyze quantitative data, and then used the results of the analysis to plan the second stage, the qualitative stage. This study took quantitative data on the implementers of the Referral Vocational Program as those who supported and subsequently used the results to determine the parties that were opposite to the implementation of the Referral Vocational Program.

Quantitative research was carried out to collect data on the financial management conditions of the production units of Referral Vocational Schools in 5 Provincial Vocational Schools in DI. Yogyakarta, included SMK 2 Depok, 6 Yogyakarta Vocational Schools, 2 Wonosari Vocational Schools, 1 Kalasan Vocational High School, and 2 Sewon Vocational High School. Furthermore, qualitative research was carried out in two stages, namely holding a meeting between the managers of the production units of the SMK and the Provincial Education, Youth and Sports Department. Yogyakarta, and followed the Focus Group Discussion which discussed the financial

management of the production unit organized by the Provincial Education, Youth and Sports Department. Yogyakarta by inviting resource persons from the Head of Compassionate Vocational School 2, Vocational Field Lecturers, and Regional Finance and Revenue Management Services of Yogyakarta Province.

RESEARCH RESULTS AND DISCUSSION

The results of research on Profile of Referral and Financial Management Vocational Schools in 5 Vocational Schools are shown in Figure 1.

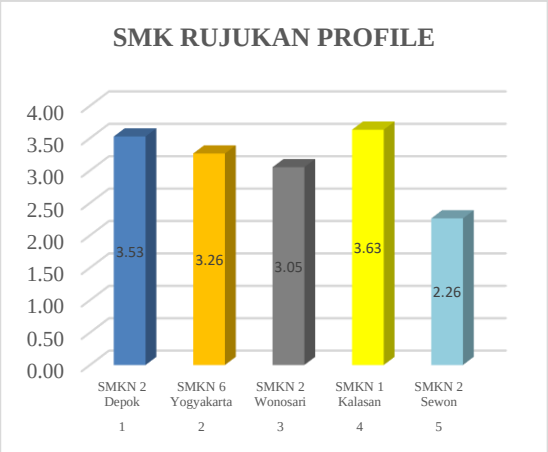

Figure 1. SMK Rujukan Profile

Profile Values of Referral Vocational High Schools from each Vocational School are Depok Vocational High School 2 with a grade of 3.53 with the Appropriate category, Vocational High School 6 Yogyakarta gets a score of 3.26 in the Appropriate category, Vocational High School 2 Wonosari gets a score of 3.05 in the Appropriate category, and Vocational High School 1 Kalasan gets a score of 3.63 in the category Appropriate, so that it meets the requirements as a Referral Vocational School. Whereas SMK 2 Sewon with a value of 2.26 in the category of Inappropriate.

In the spider web (spyder web) diagram of the Referral Vocational Profile are shown in Figure 2. Based on the results of the Figure 2, there were 4 schools that had fulfilled the requirements as Referral Vocational Schools in the Appropriate category and 1 school has not met the requirements as a Referral Vocational School. 4 schools that have fulfilled these requirements, namely SMK 2 Depok, SMK 6 Yogyakarta, SMKN 2 Wonosari, and SMKN 1 Kalasan.

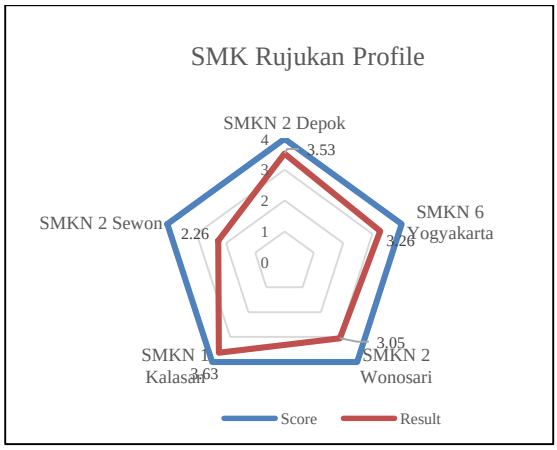

Figure 2. SMK Rujukan Profile

Based on these two data, of the 5 schools studied there were 4 Vocational Schools that had qualified as Referral Vocational Schools, namely SMKN Depok 2, SMKN 6 Yogyakarta, SMKN 2 Wonosari, and SMKN 1 Kalasan. Whereas SMKN 2 Sewon had not fulfilled the requirements as a Referral Vocational School.

Research Results on Financial Management of the Production Unit are shown in Figure 3.

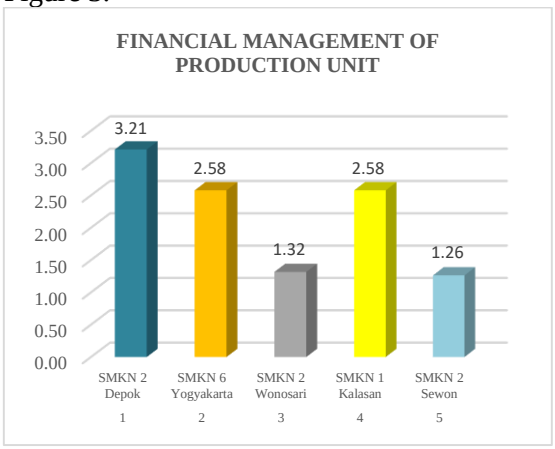

Figure 3. Financial Management of the Production Unit

Score of financial management production units of each Vocational High School were SMKN 2 Depok obtained a score of 3.32 in the Appropriate category, SMKN 6 Yogyakarta obtained a score of 2.58 in the Less Compliant category, SMKN 2 Wonosari obtained a score of 1.32 in the Unsuitable category, SMKN 1 Kalasan obtained the score was 2.58 in the Less Compliant category, and SMKN 2 Sewon had a score of 1.26 in the category of Not Appropriate.

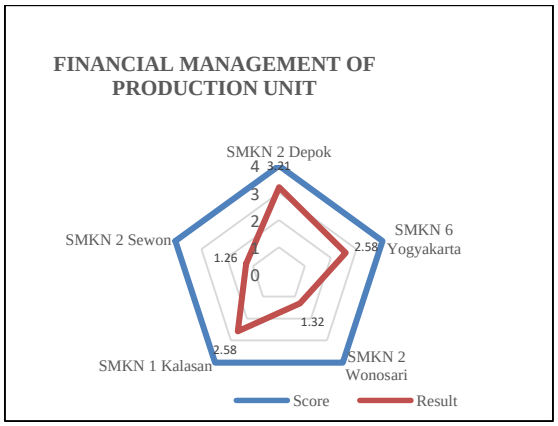

Figure 4. UP Management Production

Based on the data above it can be concluded that from 5 schools studied 1 school (SMKN 2 Depok) had implemented financial management of the production unit according to adequate management provisions, while 4 other schools (SMK 6 Yogyakarta, SMKN 2 Wonosari, SMKN 1 Kalasan, and SMKN 2 Sewon) had not managed the financial unit of production in accordance with the provisions of adequate financial management.

Based on the above data, it can be described in Table 1.

Table 1. Data on Financial Management of Production Unit

NO	Respondent	Score	
		Profile of SMK Rujukan	Financial Management Producition Unit
1	SMKN 2 Depok	3,53	3,21
2	SMKN 6 Yogyakarta	3,26	2,58
3	SMKN 2 Wonosari	3,11	1,32
4	SMKN 1 Kalasan	3,63	2,58
5	SMKN 2 Sewon	2,42	1,26

Based on these data it could be conclude that of the 5 schools studied, only 1 (one) school, namely SMK 2 Depok, was categorized as Referral Vocational School and had sufficient financial management of the production unit (Appropriate). While the other 4 SMKs did not have sufficient financial management.

The total score obtained for 2 (two) aspects consisting of referral vocational profiles and financial management of the production units of each vocational school were SMKN 2 Depok obtained score 3,42 (Appropriate) on Vocational High School Profile and Financial Management Production Unit 3,21 (Appropriate). SMKN 6 Yogyakarta obtained SMK Rujukan Profile 3.26 (Appropriate) and 2,58 (Less Appropriate) Financial Management Production Unit. SMKN 2 Wonosari obtained) SMK Rujukan Profile 3.11 (Appropriate and Financial Management Production Unit 1, 32 (Not Appropriate). SMK 1 Kalasan obtained SMK Rujukan Profile 3,63 (Appropriate) and Financial Management Production Unit 2,58 (Inadequate), and SMKN 2 Sewon obtained SMK Rujukan Profile 2,42 (Inadequate) and Financial Management of Production Unit 1, 26 (Not Appropriate).

Based on these data it could be conclude that of the 5 schools studied, only 1 (one) school, namely SMK 2 Depok, was categorized as Referral Vocational School and had sufficient financial management of the production unit (Appropriate). Whereas based on the image shown in the spider web diagram on the results of the evaluation of Profile of Referral Vocational Schools and Financial Management of Production Units, schools that had high scores in the Profile of Referral Vocational Schools (SMK Rujukan) had a more adequate Production Unit Financial Management than those with lower grades. Whereas SMKs that had lower SMK Rujukan Profile scores tend to have lower Production Unit Financial Management score.

Discussion was the next step in this research. The discussion was conducted to discuss the financial management pattern of the production unit in 2 (two) stages as follows:

1. Discussion with Respondents and the Provincial Education Office

This discussion activity was held on September 14, 2017 at the UNY Postgraduate Program. The discussion forum was attended by production unit managers of SMKN 2 Wonosari, SMK 6 Yogyakarta, SMK 1 Kalasan, SMKN 2 Sewon, and Head of Vocational Secondary Education Section of the Department of Education, Culture, Youth and Sports of the Special Province of Yogyakarta. The agenda of the meeting was the presentation of the results of research on several schools that were the object of research. The current production unit Financial Management Patterns, alternative financial management patterns suitable for SMK production units (Regular Satker / BLUD), and how the production unit management policy would be developed by the Provincial Education Office. The results of this discussion are shown in Table 2.

Table 2. Discussion Result of Respondent and Department of Education, Culture, Youth and Sports of the Special Province of Yogyakarta

No	SMK	Department of Education, Culture, Youth and Sports of the Special Province of Yogyakarta	Solusi
1.	Schools had no flexibility in financial management of production units.	1. The flexibility of financial management of the production unit could be obtained if the school applied BLUD, while the Office did not have a pattern that is in accordance with the current conditions yet, so further assessment is needed. 2. The Office was considering a pattern of management of production units that are suitable for Vocational Schools, between Public Service Agencies (BLU) or Regular Satkers	The Office would conduct a Focus Group Discussion which present relevant parties including vocational schools to assessment which pattern was suitable for SMK
2.	School Production Units had the potential product to be developed better such as before there are non-tax state revenue rules. The production unit was more developed into a place of practical learning currently		
3.	Schools had no flexibility in financial management of production units as before		
4.	A legal protection governing the management of production units need to be created, so schools could manage production units safely		

Focus Group Discussion with the Education Office of the Education, Youth and Sports Agency of the Special Province of Yogyakarta.

This activity was organized by the Field of Secondary and Higher Education, Department of Youth and Sports Education of the Special Province of Yogyakarta on September 22, 2017 at the Department of Youth and Sports Education of the Special Province of Yogyakarta. This meeting presented Dr. Toto Sugiharto Arifin, M.Hum. (Teaching Factory), Head of SMKN 2 Pengasih, and the Head of the Legal Bureau of the Regional Revenue and Financial Management Office. The agenda of the activity were information about Teaching Factory, Implementation of Teaching Factory in SMK 2 Pengasih, Kulon Progo, and Management of SMK Production Units from the Provincial Revenue, Management and Financial Assets Office of DI. Yogyakarta (Amin Purwani, S.H, M.Ed. Cv).

Representative of the school asked the rules regarding the financial management of the unit were very important to be realized. Most of the SMKs had income from the production unit. The school wanted that there would be flexibility in financial management of the production unit, so the income can be used directly in supporting the operations of the production unit. The response given by the resource person regarding the financial management rules of the production unit was as follows: (1) The transfer of the SMA / SMK authority to the Provincial Service has not regulated the management of SMK production units regulation, (2) in drafting legal rules, such as in the management of production units, local governments need to take several steps, namely: (a) verifying whether there was already a regulation or not that regulates the management of the previous production unit; (b) mapping of existing regulations; (c) identification of data needed;(d) checking wether there exceptions to the conditions that will be made; (3) The Provincial Dikpora Service had not been able to establish the right pattern, because further studies are needed

The next response was related to the flexibility in financial management of the production unit, which the income could be used directly in supporting the operations of the production unit as follows:

First, The current financial management pattern was the usual satker pattern. The usual satker pattern was a pattern in which every domestic revenue arising as a result of service to the community carried out by Government Agencies must be deposited in the state treasury. The Provincial Dikpora Office need to have an acceptance treasurer in charge of depositing production unit income received by the school through the treasury of admission

assistants who are in the school or in the dikmen in the district / city.

Second, in the case of financial management using the BLUD pattern, schools must fulfill the substantive, administrative and technical requirements stipulated in the *Peraturan Menteri Dalam Negeri* No. 61 of 2007 (Menteri Dalam Negeri, 2007) concerning Technical Guidelines for the Management of Regional Public Service Bodies.

First, In terms of the pattern of financial management of the ordinary satker, the costs incurred by the production unit such as maintenance, honoraria, etc. could be budgeted in the School Budget and Expenditure Plan. Revenue received by the production unit must be immediately deposited to the State treasury within 1 day.

Second, In the case of BLUD financial management patterns, schools must have funding independence. Management of production unit assets was separate from school management. There is independence in its management. Revenue received can be directly used for production unit operations.

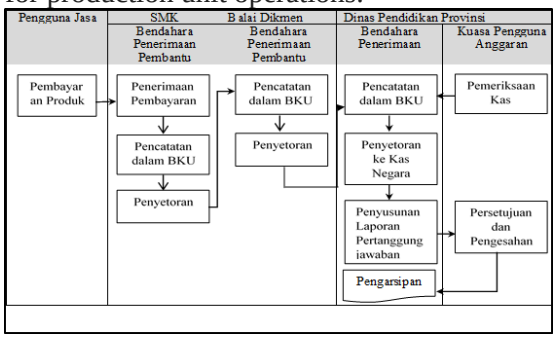

Figure 5. Work Unit (Satker Biasa) Management Pattern

The diagram above explained that service users made payments for goods/services provided by vocational schools. The income received by the service user was recorded in the general cash book (BKU) by the treasurer receiving the school assistant. The treasurer of maid receipts must immediately deposit the income received to the treasurer of the auxiliary receipt, the Balai Dikmen within one working day from the time the income was received. Furthermore, the treasurer of the auxiliary assistant recorded the receipt to the BKU and deposited it to the Receiving Treasurer at the DI Provincial Office of Dikpora. Yogyakarta. Receiving Treasurer must immediately deposit to the State treasury within 1 business day of receipt of income

In the usual management pattern of the satker, all costs incurred from the cooperation carried out had been budgeted in the School Budget Plan (RAPBS) each year. The production unit must prepare a budget to meet the cost needs in the coming year such as materials, tools, honorariums, etc. and submitted to school. The School had responsibility to budget the cost of procuring, maintaining and maintaining state property. The advantages of this pattern, the operational costs of the production unit could be accommodate in the school budget. The weakness of the financial management of the production unit was not independent, it was still under the control of the school. If there was a need for materials and equipment, maintenance of buildings and equipment in the production unit, the management must wait for approval and budget from the school.

The financial management pattern of the Public Service Agency/Regional Public Service Agency (BLUD) provided flexibility in the form of flexibility to implement sound business practices. The aim was to improve services to the community in order to promote public welfare and educate the life of the nation, as an exception to the provisions of regional financial management in general.

School would implement BLUD management patterns in whose production units must meet the substantive, technical and administrative requirements as stipulated in Article 4 of the *Peraturan Menteri Dalam Negeri* No. 61 of 2007. Substantive requirements were fulfilled if the tasks and functions of the Regional Work Unit (SKPD) or work unit were operational in carrying out public services that produced semi public goods/services. The public services referred to in article 5 paragraph (1) related to (1) the provision of public goods and /or services to improve the quality and quantity of community services, (2) the management of certain regions/regions for the purpose of improving the economy of the community and public services, and/or (3) management of special funds in order to improve the economy and/or public services. In this case some schools have had products in the form of semi-public goods/services to improve the eco-nomy and public services. However, Article 6 states that the provision of goods and/or public ser-

vices as referred to in Article 5 in paragraph (2) letter a, is prioritized for health services.

The technical requirements referred to in article 4, according to article 9 can be fulfilled if (1) the performance of services in the field of duty and its functions were worthy of being managed and enhanced its achievements through BLUD on the recommendation of the regional secretary for SKPD or the head of SKPD for work units and (2) SKPD financial performance or a healthy work unit. In the event that the school would propose the financial management of its production unit to become a BLUD, there must be a recommendation from the Provincial Secretary of DI. Yogyakarta to the principal.

Criteria worthy of being managed in Article 9 letter a included (1) having the potential to improve service delivery effectively, efficiently and productively, and (2) having technical specifications related to direct services to public services to the public. While the sound financial criteria in article 9 letter b are indicated by the level of income ability of services that tend to increase and be efficient in financing expenses. Based on the above criteria, then of the 5 Vocational Schools studied showed that there were products/services provided by vocational schools that are directly related to public services such as hospitality, but more products/services were not directly related to public services in the community. Based on the results of observations on reports and interviews, the SMKs studied were not yet analyzing on the ability of income and efficiency of costs incurred. The financial statements were still simple, record only income and expenses.

Administrative requirements in Article 4 are fulfilled, if the SKPD or Work Unit made and submited documents which include: (1) a statement of ability to improve service, financial and benefit performance for the community, (2) governance patterns, (3) business strategic plan, (3) minimum service standards, (4) principal financial statements or financial statement prognosis/projections; and, (5) latest audit report or statement of willingness to be independently audited.

Based on the above provisions, Vocational Schools applying for BLUD need to prepare the document. In the explanation of the next article the statement of commitment as referred to in article 11 letter a for BLUD-work units was made by the principal and known by the Head of the Provincial Dikpora Office. While the pattern of governance as stipulated in article 11 letter b was an internal regulation made by the work unit/school that would implement the BLUD.

Based on the observations and datas, there were 4 Vocational Schools that had standard operating procedures regarding the production units established in the ISO 9001 quality management system.

The next requirement in article 14, the school must prepare a Business Strategic Plan which included a five-year strategic plan that consists of a vision, mission, strategic program, measurement of performance achievement, performance achievement plan, five-year achievement plan and five-year financial project from school. Schools must also set a minimum service standard that included minimal limits on the type and quality of basic services. Based on the observations in 5 Vocational Schools, in general they had had a school development plan, but no one had specifically had a production unit business plan.

The principal financial statements based on article 16 paragraph (1) that must be prepared by the school consists of budget realization reports, balance sheets, and financial statement records. The principal financial statements as stipulated in paragraph (1) of the article were prepared based on the accounting system that applied to local governments. The financial prognosis/projection as referred to in article 11 letter e included the prognosis/projection of the operational report and the prognosis/balance sheet projection. Based on observations and existing documents, the report on financial management of production units in the researched vocational schools were still simple, no school had implemented accounting standards issued by the Indonesian accounting professional association as required in Article 16 paragraph (4). While the prognosis/projection report does not yet exist.

The final audit report on the last year's financial statements by the external auditor must be submitted before the SKPD or work unit (in this case the school) was proposed to apply PPK-BLUD as stipulated in article 17. In the event that the SKPD or work unit was not yet ready, then the Head of the SKPD or head work units/principals who would apply BLUDs

were required to make a statement prepared to be independently audited.

Form of protection for the financial management of production units had not been established for SMK in the province of DI. Yogyakart. Of the 5 schools studied there were no schools had implemented financial management patterns in accordance with the applicable regulations.

The submission mechanism for implementing PKK-BLUD according to articles 18 and 19 was as follows:

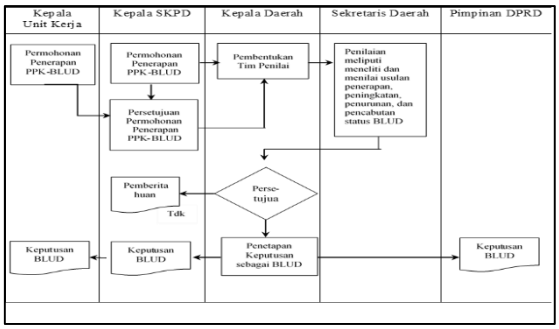

Figure 6. Work Unit (Satker Biasa) Management Pattern

Based on the above mechanism, it could be seen that the work unit or satuan kerja that would implement the BLUD need to take steps starting from the work unit or SKPD that would implement the BLUD Financial Management Pattern (PKK), submitting an application for the implementation of PKK-BLUD to the Regional Head. Furthermore, the Governor as the Regional Head would form an assessment team chaired by the Regional Secretary. The Assessment Team would research and assess the proposed implementation, improvement, decline and revocation of BLUD status. The Regional Head gave approval or rejection based on the results of the assessment. The Regional Head made the decision of the school or satker that applied PKK-BLUD and submited the decision to the school or relevant satker no later than 1 month after the date of stipulation

BLUD status could be given in full or in stages status depending on the results of the assessment. The status of full BLUD according to article 24 was given if all substantive, administrative and technical requirements. The status of a gradual BLUD according to Section 26 could be increased to full at the suggestion of the BLUD leader to the Regional Head in accordance with the mechanism for determining BLUD. The status of a gradual BLUD according to article 27 was given flexibility at certain limits relating to the amount of funds that could be managed directly, managing goods, managing accounts receivable, as well as formulating standards, policies, systems and procedures for financial management. The status of a gradual BLUD according to article 28 is not given flexibility in terms of investment management, debt management, and procurement of goods and/or services.

CONCLUSION

Based on the results of mixed methods research with the advesary model with data collection techniques, observation, interviews and documentation studies carried out in 5 (five) SMK Rujukan in Yogyakarta Province regarding the financial management of production units, it can be concluded as follows.

The value of financial management of the production units of each vocational school was SMK 2 Depok with score 3.21 in the corresponding category, SMKN 6 Yogyakarta with sore 2.58 in the category of inappropriate, SMKN 2 Wonosari with score 1.32 in the category of inappropriate, SMK 1 Kalasan with score 2.58 in the category of Inadequate, and SMK 2 in Sewon with score of 1.26 in the category of Not Appropriate. Based on these results there were only one school, namely SMKN 2 Depok which had adequate financial management of the production unit, while the other four schools still did not manage an adequate production unit. This shows that the financial management of the Referral Vocational Production Unit in DI Yogyakarta Province had not been effective.

The pattern of financial management of production units had not been established in the SMK Rujukan Program in the DI Yogyakarta province. There was no form of legal protection provided by the government in the financial management of production units for Referral Vocational Schools in the DI Yogyakarta province.

The role of relevant government agencies was quite good in providing legal protection solutions to the financial management of the production units of Referral Vocational Schools in DI Yogyakarta Province. The Yogyakarta Education, Youth and Sports Agency was collaborating with the Provincial DI Re-

venue, Management and Asset Management Office Yogyakarta the role of relevant government agencies in providing legal protection solutions to financial management of production units of SMK Rujukan in Yogyakarta Province. The institution was reviewing regulations that were in line with the financial management of production units with two alternatives, namely Financial Management Patterns of the Regular Satker Production Unit or Regional Public Service Agency.

The suggestions that can be given are as follows: (1) Regulations concerning the pattern of financial management need to be immediately realized as a legal protection for SMK in managing production units to be more optimal, safe and accountable, (2) The financial management of the ordinary satker became the most suitable alternative to the current condition of the SMK, when viewed from the differences in the financial management of the regular Satker and BLUD and the results of the above studies, (3) Financial management of vocational production units could be directed to BLUD in the future. However, for the initial stage it was necessary to establish several model schools that were selected based on product excellence and governance to become BLUDs-Work units under BLUD-Satkers namely the Education, Youth and Sports Service of the Province of DI Yogyakarta, (4) The Education, Youth and Sports Office needs to set the criteria for schools that would be a model for applying BLUD financial management patterns.

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DEVELOPMENT OF MICROPROCESSOR LEARNING MEDIA USING ZILOG Z-80 FOR VOCATIONAL SCHOOL STUDENTS OF ELECTRONIC ENGINEERING EXPERT PROGRAM

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Abstract

This development research aims to develop microprocessor learning media using Zilog Z80. The Learning Media quality is based on the following aspects: (1) media feasibility according to subject matter experts and media experts; (2) effective based on students ability test by pre test and post-test. The developed cycles and procedures refer to the ADDIE model (analysis, design, development, implementation, and evaluation). This development research produces learning media as microprocessor kits training and e-Learning namely "µProsessor" as learning support. Data analysis techniques to test the effectiveness of learning media using Paired Samples T-Test and Using a Likert scale to test the feasibility of learning media. The research results show that the feasibility of learning media is enough with a high score of above 88% and Paired Samples Test results for media effectiveness show an increase in the value of significant microprocessor capabilities. Measuring the improvement of the ability of students' microprocessors using N-gain (normalized gain). The results of the calculation of N-gain in the large group is 0.72 in the high category. Interpretation of the results of the research can be concluded that effective learning media as a learning media for microprocessors.

Keywords: *learning media, research and development, ADDIE model, microprocessors*

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INTRODUCTION

Almost everything related to human activities was assisted by computers. Electronics is the basis of this machine. To understand how the computers work, we must have understood the basis of a computer system, there is a microprocessor. In the microprocessor system, there are sub-system blocks that are integrated to become a complete system. The microprocessor system is one of the subjects in Vocational High Schools (SMK). In Curriculum 2013, microprocessors become subjects with lots of material but have a little study time. Where the microprocessor subjects are given together with other materials, namely basic programming and microcontroller, but only have 3 hours/week of study time. To be able to achieve the learning objectives and the completion of everything that is available, the teacher must find effective and efficient ways to carry out learning. One of the training kits is MPF-1 with the Zilog Z-80.

In ideal learning, there will always be an interaction between teachers and students. Because teachers and students are two elements that are in the learning environment and utilize learning resources. Related to the interaction between teachers and students, students' perception of the teacher's ability to teach and use learning resources such as learning media can be used as material for feedback on the quality of teaching and the ability of teachers to use learning media (Sutrisno & Siswanto, 2016, p. 113).

Therefore, it is necessary to make an appropriate learning media so that it can help teachers and students.. According to Anggara based on observations that have been made on the subject of the microprocessor were lack of attention and not in accordance with the existing Basic Competencies. Therefore, by developing microprocessor learning, it is expected that vocational students can understand the working principle of microprocessor systems more easily (Anggara, 2016, p. 1038).

In addition, based on the results of Fathia's research that has been conducted on 11 Vocational School of Electronics Study Programs in Indonesia, it can be seen that the implementation of Microprocessor Learning in outline is not in accordance with the Core Competencies and Basic Competencies that exist. The contributing factors include: (1) In terms of infrastructure, microprocessor training kits are difficult to obtain. (2) In terms of the teacher, it was difficult to operate the microprocessor Training kits and had a view of the microprocessor was not important than the microcontroller so that it no longer needed to be taught, (3) In terms of students, more interested in simple and practical things such as microcontrollers (Fathia, 2017, pp. 511–512). Sarosa & Khairudin (2016, p. 31) get the results of research that the right learning media can clarify the delivery of microprocessor material, guide users to independent learning, learning, and attract attention.

From the basis of previous studies, it can be concluded that the use of learning media is very important in microprocessor learning. By looking at the advantages and disadvantages as well as other factors in the previous research, the researcher will develop "Microprocessor Learning Media". The media is a training kit that is integrated with computers, so students get a variety of learning media in the form of presentations, animated videos, job sheets, simulations and practical work directly using training kit based Z80 microprocessor. Because if it is not supported by the right media, students will find it difficult to understand this material, especially the material is quite difficult and abstract. For an explanation of abstract material, an explanation is needed in a visual illustration, it will provide a faster understanding. Arsyad (2015, p. 11) says that the more the five senses are responsible for accessing and processing information, the greater this information is understood and stored in memory. This is an effort in maximizing the Core Competencies and Basic Competencies and making Training kits that is user-friendly both from the teacher and student side.

Wirawan, Indrawati, & Rahmanto (2017, p. 85) state that the use of learning media is a very important factor to improve student learning outcomes in the learning process, because learning media is one of the tools that is very supportive in the development of knowledge possessed by a person, especially in the learning process at school. So that the school should pay attention to and provide a complete educational media so that the learning process in the classroom can run effectively because students are more motivated to learn if the lesson is explained with direct practice.

There are three criteria that are used to determine the quality of a product learning media, they are valid, practical, and effective. The explanation of each aspect that will be used in the development of learning tools in this study is the following. The first is the validity aspect, said to be valid if the learning device is declared feasible to be used with revision or without revision by the teacher. Second is the practicality aspect, the learning device is said to be practical if students and teachers respond well to the use of learning devices. Third, the aspect of effectiveness, namely the learning device is said to be effective if students achieve the competencies that must be owned (Fatkhurrokhman, Permata, Ekawati, & Rizal, 2017, p. 104).

Based on the background of the problems that are quite broad, it is necessary to focus on the research to be studied. Then the researcher will issue on: (1) Development of Learning Media Zilog Z80-based Microprocessor Systems include e-Learning and Zilog Z80 Training kits that are in accordance with Basic Competencies in Basic Programming Techniques, Microprocessors and Microcontrollers; (2) Implementation of microprocessor media in learning at Vocational High Schools in South Jakarta.

The use of Zilog Z80 microprocessor learning media is (1) Theoretically, the results of this study are expected to be used as learning media for Electronics Engineering Vocational students in understanding and deepening the workings of microprocessors from the entire process. (2) Practically, the results of this research can be a medium of learning in a variety of media that are numerous and support the improvement of user skills.

METHOD

This study uses Research and Development (R & D) methods, The model used to design this project is the ADDIE Model. The ADDIE model is one of the systematic learning design models. One of the functions of ADDIE is to become a guideline in developing a learning media development design. This model in accordance with its name consists of five stages, there is a phase analysis, design phase, development phase, implementation phase, and the evaluation phase (Tegeh, Jampel, & Pudjawan, 2014, p. 41). Evaluation is the most important part in the development of this model, where each stage is carried out a small evaluation related to the stage and the overall evaluation at the end of the stage. This model is simple and with a systematic structure. Five stages in the ADDIE interrelated and systematically structured means that from the first phase until the fifth phases in the application should be systematical. This step is suitable for the characteristics of the product research and development that was done (Hamid, Aribowo, & Desmira, 2017, p. 153).

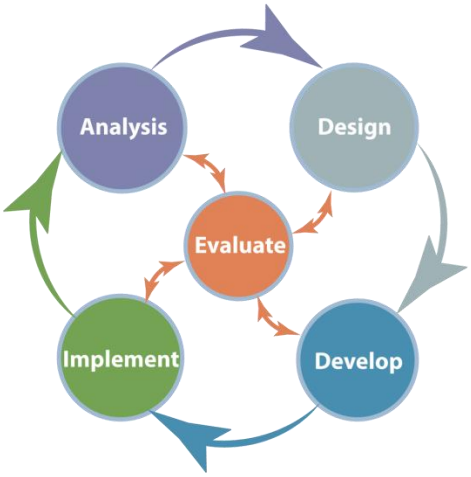


Figure 1. ADDIE Model Stages

This research was conducted at SMKN 29 Jakarta. This research was carried out in the second semester of the academic year 2017 - 2018. The Training kits trial was conducted in April - June 2018 for students of the Vocational School of Technology and Engineering in the Electronics Engineering Expertise Program in Industrial Electronics Engineering Skills Competence. The total number of students is 65 students who will be divided into large groups and small groups. Where 25% of all students become small groups and the other 75% become large groups.

Characteristics of the model developed in this study are the implementation of learning designed in the form of face-to-face presentation using learning media in the form of e-Learning and Zilog Z-80 Microprocessor Training kits. This learning media is a microprocessor system that is developed with e-Learning and Training kits integrated with computers so that we can more easily in the theoretical presentation process and in practical programming.

Based on the foundation of the model development that has been chosen, ADDIE, in the design of the model, it is necessary to analyze the needs and conditions of the field related to the subject matter raised. Needs analysis and field conditions have been explained previously in the background. After doing the analysis and getting what needs to be developed, the next step is Model Design. The media development plan chart that will be made can be seen in Figure 2.

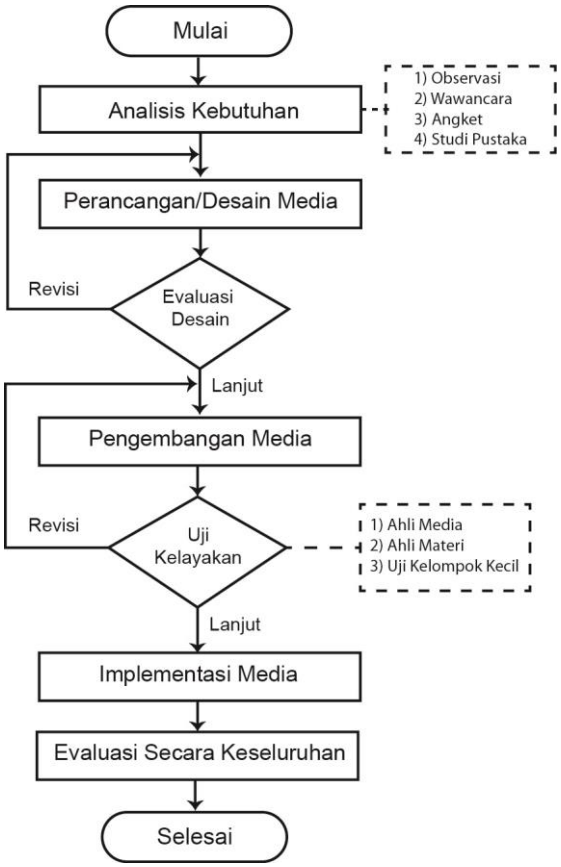


Figure 2. Chart of Media Development Plans

The Learning Model approach used is Project-based Learning. Project-based learning is a learning activity that uses projects/activities as a learning process to achieve competencies in attitudes, knowledge, and skills. The emphasis of learning lies in the activities of students to produce products by applying the skills of researching, analyzing, making, and presenting learning products based on real experience. The product in question is the result of the project in the form of Flowchart, Program and Model Tool that has been designed. This approach allows students to work independently or in groups to produce real products. In general, this Training kits design can be seen in Figure 3 and Figure 4.

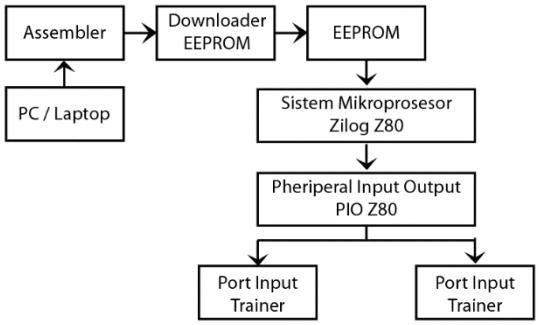


Figure 3. Block Model Design Diagram

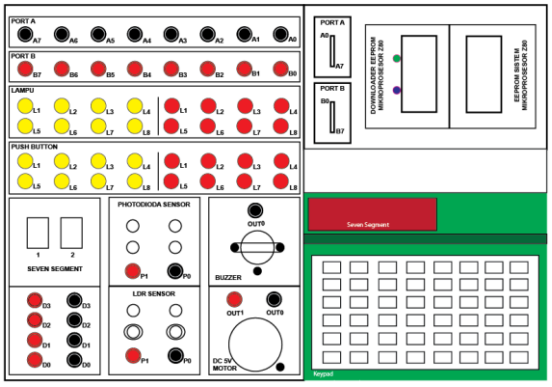


Figure 4. Looks for Microprocessor Training Kits

This research is a descriptive research that is developmental so that in this study is not intended to test certain hypotheses. The data analysis technique that was carried out in the first stage was to use qualitative descriptive, which was describing media products from the design of learning media after being implemented in the form of finished products and testing the level of product feasibility. The second stage uses quantitative descriptive, which describes the feasibility of the product to be implemented on competency standards. Understanding Microprocessor Architecture Vocational Middle School. This validation is carried out by study experts (material experts) and learning design experts (media experts). This validation instrument uses three references in the assessment, namely according to Azhar Arsyad, Rayandra Asyhar, and Romi Satrio Wahono.

Furthermore, the trial for Training kits quality and learning Training kits effectiveness as well as pretest and posttest in field trials. According to Moore D. Keneth in Moh Syarif

the effectiveness of a measure that states how far the target (quantity, quality and time) has been achieved, or the large percentage of targets achieved, the higher the effectiveness (Sumantri, 2015, p. 1). The effectiveness of learning media is carried out during media implementation by using one-group pretest-posttest design, ie there is a pretest before being treated and posttest after being treated in the same group. To test the effectiveness of learning outcomes using the two average difference test for non-free samples. Prior to testing, a normality test is performed to determine the type of statistics to be used, whether parametric statistics or non-parametric statistics (Sugiyono, 2013, p. 172).

To see how much improvement in student learning outcomes, the pretest and posttest data can be analyzed to get gain and N-gain. Gain is the difference between the pretest and posttest values. To show the quality of increasing microprocessor knowledge and students' cognitive learning outcomes, the average normalized gain (N-gain) formula is used. N-gain (normalized gain) is used to measure the improvement of science process skills and cognitive learning outcomes between before and after learning (Sundayana, 2014, p. 151). The gain index can be calculated by the formula from Meltzer, namely:

$$(Ngain) = \frac{Posttest\ score - Pretest\ score}{Maximum\ Score - Pretest\ score}$$

Table 1. . Gain Index Category

Perolehan N-Gain	Kriteria
N-Gain > 0,70	Tinggi
0,30 ≤ N-Gain ≤ 0,70	Sedang
N-Gain < 30	Rendah

(Duda, 2010, p. 31)

RESEARCH RESULTS AND DISCUSSION

Analysis Phase

At this stage, the analysis phase involves several determining processes and identifies the problems that need to be resolved.

The selection of microprocessor subject matter is based on the analysis carried out found three fundamental things in the development of microprocessor learning media, there are: (a) in terms of infrastructure, microprocessor Training kits are rare; (b) in terms of the teacher, it was difficult to operate a microprocessor Training kits and had the view that the microprocessor was not important than a microcontroller, so the microprocessor there was no need to be taught; (c) in terms of students, they are more interested in simple and practical things like microcontrollers.

It is known that the 2013 curriculum requires students to do more practicum with a comparison of 30% theory and 70% practicum. Therefore, complementing some of the shortcomings of previous studies, the authors compiled a microprocessortraining kits consisting of a microprocessor system, downloader EEPROM, and an input-output device. To supporttraining kits usage more leverage and more organized learning, for offline e-Learning that students can use on their laptops or in school laboratories. In addition, a video tutorial is provided to facilitate students in the programming learning process, because it is known that there are quite a number of students and practicum teachers who are only one problem in various vocational schools. Therefore, the teacher assistant assistant is needed, in the form of a customized video tutorial so students can follow it directly. That way learning is expected to be more effective because of the reduced time to ask repeatedly about the learning.

Design Phase

At this stage of the process, it explains the overall view of the design, structure, teaching approaches, types of media and technologies to be used. At the design stage, the authors compile the media according to the needs analysis that has been done.

e-Learning µ processor

The name of e-Learning is µprocessor, e-Learning is made offline and can be used by installing it on a computer device. In e-Learning, there are 4 main learning titles that represent 4 Basic Competencies in the subject of Programming Basics, Microprocessors and Microcontrollers. There are 3 main parts of e-Learning, namely, subject matter, simulation, and practicum.

Microprocessor training kits

MPF-1 deficiency as a previous microprocessor training kits is the location of ports A and Port B that are not sequential, the prog-

ram is stored in RAM which will be lost if the power flow is off, programming is done by typing using the keypad and will take a long time and the possibility of writing errors during the program the process of filling in the program code. For this reason, the training kits were developed with MPF-1 as a basis and complemented the deficiencies in MPF-1, they are: (1) utilizing the EEPROM Port as a place to store the program, so that it will not affect if the power supply is off; (2) use the EEPROM downloader to load programs into EEPROM, to shorten the time and reduce the possibility of errors in filling in the program code; (3) arrange PIO ports which are Port A and Port B regularly; (4) adding Input-Output devices as training kits complement, in the form of Led, Pushbutton, Light Sensor, Seven Segment, DC Electric Motor and Buzzer

The size of the training kits is designed to be lightweight and portable while still providing good clarity for the user. Then it was made with a size of 27 x 42 cm so it wasn't too big. Components are arranged regularly to facilitate usage with the help of the writing displayed in each component part.

Development Phase

This stage involves real system implementation by using all appropriate media and technology elements based on requirements Built based on the analysis phase and the design phase.

This stage of learning media development is the stage where the design results at the design stage are realized in real form. In this stage, the author makes 2 main parts, e-Learning and the microprocessor Training kits. For the main menu display of e-Learning Microprocessor can be seen in Figure 5, for the contents of the menu can be seen in Figure 6 and for examples of material contents can be seen in Figure 7.

e-Learning is expected to help the teacher in delivering the material easier and help students understand the material with their respective learning styles, which can be done visually or audio-visual by watching the video tutorial provided repeatedly so that they can understand it.

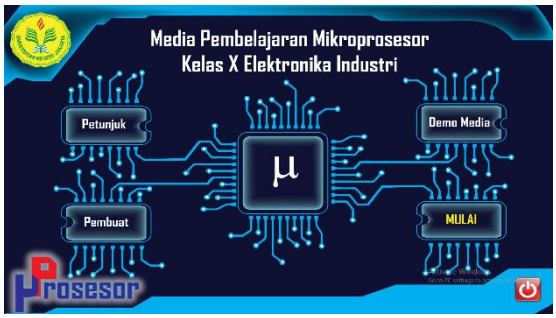


Figure 5. Initial Display of e-Learning µ Processor

Figure 6. Display Contents of e-Learning Menu µ Processor

Figure 7. Display contents of e-Learning material µ processors

For Training kits µprocessors use MPF-1 as the main board and are equipped with input-output devices as previously designed. The assembly results of the Training kits can be seen in Figure 9. for the top view, figure 10 for the rear view, and figure 11 for the side view. In this processor µprocessor, can organize inputs and outputs through two ports, namely Port A and Port B, which can be set as input or output. The connector used in this Training kits uses a banana jack to make it easier for students to connect between input-output ports and devices.

Figure 8. Appears on the Processor µ Processor

Figure 9. Rear view of the Processor µ Processor

Figure 10. Side View of the Processor µ Processor

Implement Phase

At this stage, the learning media that have been prepared will be used or implemented in real terms. In this phase, testing was also made. Learning was conducted in 5 meetings for learning material and 2 meetings for pretest and posttest. During the small group trial conducted on 16 students. For the implementation of this microprocessor learning media, it is carried out in large classes with a total of 49 students. In this implementation, the media that has been created is used as a learning support media in accordance with the learning plan that has been made. Before the media is implemented, the media must be tested for feasibility. The feasibility testing phase of learning media was conducted to see the level of validity of media use. This validation test consists of content validation and constructs validity. Content validation data was obtained through material experts while contract validation data was obtained from media experts. Material validation test results on 92% conformity aspects, 88% completeness aspects, 92.5% ease and 92.5% clarity. Media expert validation test results on communication and interactive aspects 93%, 95% suitability, 95% complete aspects, and 90% ease.

Evaluate Phase

This phase is an advanced phase of the implementation phase. The revision of the microprocessor learning media is done at the expert review stage and small group trials. In the Evaluation stage, the pretest and posttest tests were conducted and then compared the results. The calculation result of Gain in the small group is 48.19 with the N-gain index in the small group is 0.72 in the high category.

For the results of calculating large group data, the average value of the pretest of the microprocessor's ability before being carried out by the researcher is 30.41. The average posttest value of the microprocessor's ability is 79.96. The gain value of microprocessor capability is 49.55. The N-gain value of problem-solving ability is 0.71.

To see whether there is an increase in the ability of the microprocessor for students between pretest and posttest on the microprocessor, it is necessary to test hypotheses using parametric statistical tests because the data obtained are normally distributed. Testing is carried out using a paired sample t-test. Testing criteria if the significance value <0.05 then Ha is accepted and Ho is rejected, while if the significance is> 0.05 then Ho is accepted and Ha is rejected. the result of different test the value of the microprocessor ability between pretest and posttest was obtained by Sig. (2-tailed) of 0,000, because Asymp. Sig. (2-tailed) <0.05 then Ha is accepted and Ho is rejected, so it can be concluded that there is an increase in the value of the microprocessor ability between pretest and posttest before and after learning.

Discussion

The microprocessor subject to date is a basic subject for understanding digital techniques at the vocational high school level in

electronic competence. In developing instructional media µ Processors that have been carried out in the form of Training kits and e-Learning are improvements from the previous Training kits, MPF-1. In addition, the results of the development of learning media also pay attention to the advantages and disadvantages of previous related studies. The research was conducted by N. Topalaglu and O. Gürdal from Turkey in 2010, where they made microprocessor learning media to study microprocessor architecture and Assembly programming language. The result is that the media can help students well in understanding the architecture and programming of microprocessors but limited to the simulator. From this study, the authors developed this learning media equipped with e-Learning with the aim of making it easier for students to understand theoretically the microprocessor as already done by N. Topalaglu and O. Gürdal. Subsequent research conducted by Doni Sarosa and Moh. Khairudin in 2016, developed an interactive learning media which broadly had the same objectives as N. Topalaglu and O. Gürdal, where the media contained microprocessor material with a wider scope, which included the main material, introduction, history, benefits, basic microprocessor, and the basic components of the microprocessor. However, as with previous studies, this study is limited to aspects of student knowledge. In connection with this, the author develops learning media that can help students understand microprocessor material with e-Learning and adapted to Basic Competencies in the revised Curriculum 2013. Basic competencies in the Curriculum 2013 consist of cognitive aspects with initial code 3 and psychomotor aspects with initial code 4. Therefore, the authors develop media in the form of material that is designed visually attractive and also in the form of videos for the development of cognitive aspects. For the skills aspect, the author developed a job sheet related to existing basic competencies. For more details, can be seen in Figure 11. for cognitive aspects and Figure 12 for psychomotor aspects.

It is undeniable, the use of simulators is very important, given the small number of learning Training kits and the expensive price, the simulator becomes one of the solutions of it all. In addition, using simulators students can practice in their homes at any time to get used to the microprocessor and get a complete basic knowledge of µP in the same programming mode (Nas, 2014, p.47). Therefore, this learning media uses several complementary software, including Z80 Simulator IDE, HxD-Hexeditor, and write EEPROM. The three software are used throughout learning in several parts of competence, one of them is when the process of programming and downloading programs into EEPROM. The appearance of the software can be seen in Figure 13.

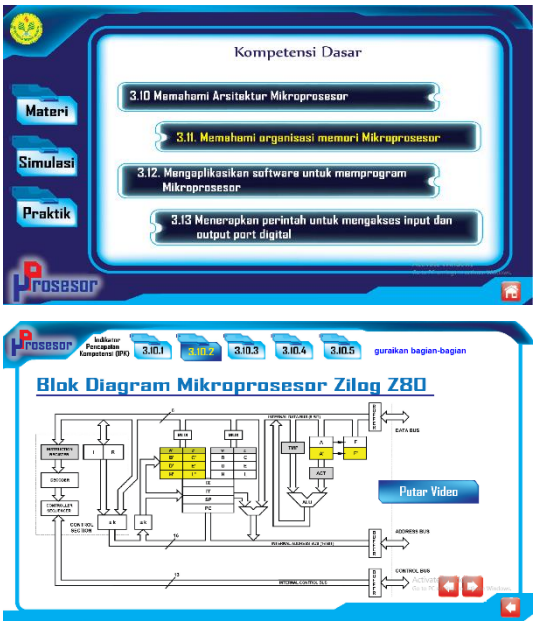


Figure 11. E-Learning Display µ Processor on Cognitive Aspect Material

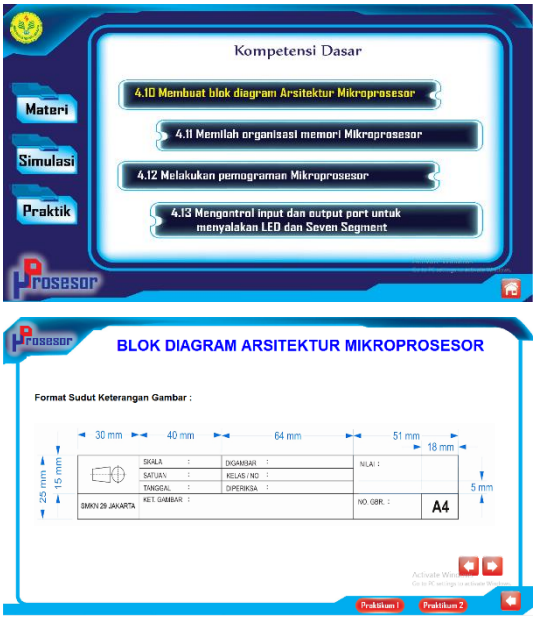
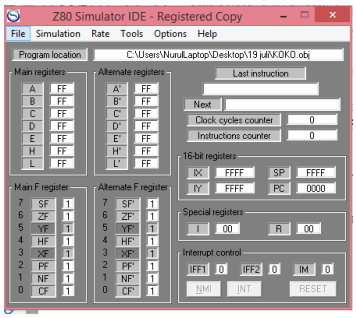
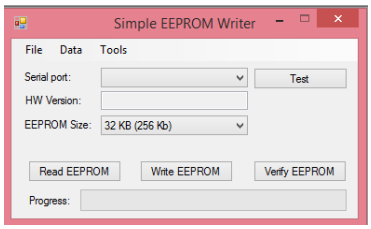


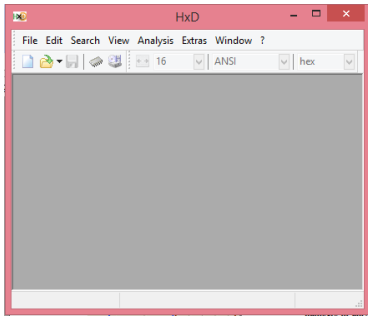
Figure 12. E-Learning Display µProcessor on Psychomotor aspects of Practice



(a)



(b)



(c)

Figure 13. (a) 80 Simulator IDE, (b) HxD-Hexeditor, dan (c) eewrite EEPROM.

Anggara in 2016, made a research related to the making of the 8088 Microprocessor System simulator based on Arduino Uno, where students were generally taught how to work from the microprocessor RAM write process. But the system created in this Training kits is not a system that uses one of the microprocessors but uses an Arduino Uno microcontroller. In addition, the Training kits created is not designed to study accessing input and output ports. Accessing input and output ports itself is one of the Basic Competencies expected by students of Industrial Electronics Competency Vocational School. Based on the basic competencies applied in the Curriculum 2013 revised, the authors develop microprocessor Training kits that can access the input-output port and executing a program with input-output devices that are also provided. Accessing input-output ports in the learning media that I developed can be seen in Figure 14. In addition to complementing the short-comings of MPF-1 as a learning medium be-fore, this media allows students to store prog-rams in EEPROM, so it does not take long in charging the program into RAM using the Keypad and no need to worry about the sudden power outage. Because if the program is filled in RAM, the program will automatically be erased if there is a power outage. The EEPROM downloader system that is used uses the help of Arduino MEGA and an rewrite program that allows, we can write a hex code into the EEPROM. To see the form of downloader EEPROM can be seen in Figure 15.

Figure 14. Accessing the Input-Output Port on the µProcessor Training kits

Figure 15. Download the EEPROM on the µ Processor Training kits

Besides being equipped with downloader, Training kits µProcessor there is an input-output device which consists of 8 LEDs, 8

Pushbutton pieces, 2 seven-segment pieces, 2 types of light sensors with 2 control signals namely LDR for high active and Photodiode for low active, 1 Buzzer and 1 dc motor that can be controlled in both directions.

CONCLUSION

Based on the research results obtained in the development of microprocessor learning media, it can be concluded as follows:

Fisrt, In developing the microprocessor learning media using the ADDIE model, with the stages of Analysis, Design, Development, Implementation and Evaluation. Media trials are carried out with small groups and large groups. The trial process was carried out as many as seven meetings. From the results of this study, it can be said that the microprocessor learning media using Zilog Z80 can support the implementation of learning.

Second, data on improving student learning outcomes can be seen from the pretest that was done before learning and posttest after learning. Testing the media using Wilcoxon while increasing the learning outcomes is used N-gain. From the results obtained, this learning media is considered effective in improving student learning outcomes in microprocessor lessons.

This microprocessor learning media can be implemented as one of the alternative media in the implementation of students' theoretical and practical learning. The use of microprocessor learning media can help students improve their cognitive and psychomotor abilities.

Based on the process and results of developing microprocessor learning media, the authors can suggest the following: (1) conduct further research from more diverse learning resources and wider practical material, (2) it is expected that the peneti is then able to develop this media in one complete software without the help of other program software, (3) The role of teachers and schools is needed to maintain and develop existing learning media. In addition to utilizing all the learning media in the school to the maximum and tailored to the needs of Basic Competencies.

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MANAGERIAL COMPETENCY EVALUATION OF VOCATIONAL SCHOOL PRINCIPALS IN MAGELANG

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Abstract

The purpose of this study was to discover the implementation of managerial competence of vocational school principals in Magelang from the perspective of (1) planning, (2) implementation, and (3) result. This study had a form of evaluation research with discrepancy method. The subjects of this study were four principals and thirty teachers of SMK Ma'arif 1 Ngluwar, SMK Ma'arif Salam, SMK Ma'arif Kota Mungkid, and SMK N 1 Salam. The data were collected using questionnaire and interview. This study used analysis of quantitative descriptive as analysis data method. The result of this study indicated that the planning of principals' managerial competence acquired from questionnaire was in "very good" category with average score 52.70; the implementation of vocational school principals' managerial competence in Magelang based on the questionnaire result was in "very good" category with the average score 127.25; and the result of vocational school principals' managerial competence in Magelang based on the questionnaire was in "very good" category with the average score 34.20.

Keywords: *evaluation, managerial competence*

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INTRODUCTION

Magelang declared itself as Vocational School District on May 2, 2014. It then brought an impact on the increasing interest of vocational school (SMK), and finally many students were enrolled in vocational schools. Even private vocational schools were established. Up to 2018, it has been noted that Magelang has 44 vocational schools: there are 3 public vocational schools, and 41 private vocational schools.

The rapid increase of vocational schools number, caused tight competition in the quality of education and competence of principals as the decision makers of all school policies and management.

The importance of principals' leadership in school performance, teacher performance in work, and student learning performance are: (1) creating a positive climate within the school or between the principal and the teacher; (2) leadership of school principals can build teacher professionalism, enthusiasm and sense of unity; (3) the principal's leadership can influence the commitment in teaching the teacher, satisfaction in work, and attitude in work, (4) the leadership of the principal can give a difference to student and affective learning attitudes, and academic results, even if the school environment is minimal academic; (5) a strong and balanced structural leadership, hu-man, political, cultural, and educational dimensions can realize the effectiveness of the school, and (6) the principal needs strong support in learning his leadership and the growth of his professionalism (Cheng, 1997, p. 9).

Regulation of Indonesian Minister of National Education (Permendiknas) Number 13 of 2007 (Menteri Pendidikan Nasional Republik Indonesia, 2007) concerning Standards for Principals of Schools/Madrasah states that Principals (KS) must have five competencies namely: Personality, Managerial Skills, Entrepreneurship, Supervision, and Social Conscience.

The school has the authority to regulate and manage the school fully and independently, so the school pricipals must have five competencies. Refers to the National Education Standards (SNP) which are regulated by Government Regulation (PP) Number 32 of 2013 jo PP Number 19 of 2005, Article 1 paragraph 1 (Presiden Republik Indonesia, 2013); national education standards are the minimum criteria for running the education system in Indonesia.

There are 8 standards, namely: (1) content standards, (2) process standards, 3) graduate competency standards, (4) standards of educators and education personnel, (5) facilities and infrastructure standards, (6) management standards, (7) financing standards, and (8) educational assessment standards. In carrying out school-based management, the principal is assisted by these eight standards as a benchmark for the management success. Thus, later, the results of effectiveness, efficiency, and productivity are expected to be achieved in the implementation of managerial competence. SNP aims to provide signs to school principals in managing education in their respective schools.

Educational failures are caused by inappropriate management, placement of personnel that is not in accordance with the field of expertise, and problems which are not handled by experts, so that the goals of national education to educate the life of the nation through improving the quality of each type and level of education have not been realized (Mulyasa, 2007, p. 6).

The efforts to improve the quality of human resources continue to be made by changing education policy that was originally implemented by the district government, now handled directly by the provincial government or decentralization, through Law No. 23 of 2014, article 12 concerning Regional Government (Presiden Republik Indonesia, 2014). This is done by the central government with the aim of increasing education equity in terms of the competence of educators, education personnel, students, supervisors, and the quality of secondary education at the provincial level. Change in education management is according to Law Number 23 of 2014 concerning Regional Governance (Presiden Republik Indonesia, 2014), namely education policy, curriculum, accreditation, educators and education personnel, as well as education licensing. The establishment of the law on decentralization of education is in line with the regional autonomy policy. Decentralization of education is also a manifestation of regional autonomy itself.

Center for Educational Assessment (*Pusat Penilaian Pendidikan*/Puspendik) suggests that the current education system gene-

rally does not match the expected quality. This assessment is based on the students' low ability to answer the vocational high school national exams. Other indicators are skills that are characteristic of vocational education, faith, sense of responsibility, and character that have not received adequate attention. In addition, the increasing number of educated people who are unemployed is also an indicator of the low quality of education. The indication of the low quality of education above is presumably due to the low quality that includes the current education program (curriculum and learning), school administration and management, the current educational staff of the school, the input and development of students, educational facilities and infrastructure, and the low quality of community participation in education. In addition, among the causes of the low quality of education, education policies issued by the government are not in line with matters relating to improving the quality of education (Pusat Penelitian dan Pengembangan Kementerian Pendidikan dan Kebudayaan Repbulik Indonesia, 2015).

Results of a survey conducted by the Working Group on the development of the Principal Quality Standards in the Academic Manuscript of the Principal Qualification and Competency Standards by the National Education Standards Agency (*Badan Standar Nasional Pendidikan*/BSNP) in 2006 showed that the performance of principals that had not been as expected. It also emphasized that the results of the research submitted by the director of education staff in the Training of Trainers (ToT) Facilitator candidates for school principals and supervisors on February 6, 2009 showed that of the five competencies of principals namely: (1) personality competence, (2) managerial competence, (3) supervision competence, (4) social competence, and (5) entrepreneurial competency, managerial competence and supervision of principals were still low (Purwanto, 2010, pp. 55–63).

Managerial competencies are needed by principals to: (1) plan schools, (2) design school organizations, (3) manage teachers and staff, (4) manage facilities and infrastructure, (5) maintain school and community relations, (6) manage student affairs, (7) develop curriculum, (8) manage school finance, (9) manage school administration, (10) manage special school service units, (11) develop entrepreneurship in schools, (12) create a culture and work climate, (13) manage school information systems, (14) manage information technology, (15) manage product / service activities, and (16) conduct school supervision (Kompri, 2017, p. 109).

The implementation of principals' managerial competencies has not been implemented properly according to 16 indicators of managerial competency standards, (2) inhibiting factors: (a) principals do not have competency standards; (b) the lack of experience of the principal; (c) inability to prepare school plans; (d) lack of coordination and cooperation; (e) lack of school facilities and infrastructure; (f) lack of training; and (g) lack of supervision from superiors (Adi, 2016, pp. 1–16).

Administrative competency needs of principals for effective school administration at the high school level in the Southwest Geo-Political Zone of Nigeria. Learning reveals that the instructional leadership skills needed by school principals for effective school administration include: principals working with teachers to set goals, provide primary facilities, supervise lesson plans, teaching and learning activities, evaluate plans and implement curriculum. It was also shown from the results of research that the main personnel management skills needed by school principals for effective schools included administration: the main motivating staff, encouraging professional staff development, communicating affective with staff, resolving conflicts. It is equally revealed from the research findings needed by financial management experts Effective school administration includes: the basic budget prepared together with staff management, funding sources, storing accurate financial information, providing correct and fair financial positions in schools (Adegbemile, 2011, p. 1).

Based on these problems, it is necessary to conduct research on managerial competence of principals. This study was important to see how far the managerial competency implementation of the principals, which later can be the basis of consideration of the related education office to evaluate and provide alternative solutions on how to improve the managerial competence of principals in the field.

The purpose of this research was to see how far the implementation of managerial competencies of principals in SMK Ma'arif 1 Ngluwar, SMK Ma'arif Salam, SMK Ma'arif

Kota Mungkid, and SMK N 1 Salam, focusing on understanding how far the implementation of managerial competence in planning, implementation process and the results of the implementation of vocational school principals in Magelang.

Meanwhile the theoretical benefit of this research was to measure the achievement of competence managerial implementation as one of the principal evaluation materials and related official reference materials to improve managerial competence of principals, especially in Magelang. Whereas practically this research was as a reflection of the implementation of managerial competencies that have been conducted, so that the principals can evaluate improvements at various points that were deemed incomplete.

RESEARCH METHOD

The research method used was quantitative method. This method is used to answer the problem statement questions. The research instrument was made to purify the discussion.

The presentation of the results of this study uses descriptive aspects to present systematically the results of research that has been done so that it is easily understood by the reader. This study procedurally uses a discrepancy evaluation model, or gap through three stages (initial-identification-comparison) with a focus on planning, implementation processes and achievement of results from the principal's managerial implementation. The research focused on SMK Ma'arif 1 Ngluwar, SMK Ma'arif Salam, SMK Ma'arif Kota Mungkid, and SMK N 1 Salam. Respondents in this study were teachers and principals in the schools mentioned above.

This study also used data collection tools in form of instrument validity and instrument reliability. Instrument validity used was construct validity to obtain valid data, measuring what should be measured. After that, there were consultation sessions with experts to decide whether it was feasible to be used. The instrument reliability used was Alpha Cronbach formula, to measure whether it is truly reliable, consistent, or steady.

The technique used was questionnaire data done through fast symptom calculation and variable (M) - (Me) - (Mo) - (SD).

RESEARCH RESULTS AND DISCUSSION

First, data analysis on the aspects of planning carried out by the principal which includes the vision, mission and objectives of the school. Data in this study were obtained through questionnaires.

In the principal manager's competency planning, the school principal implements the school / madrasa vision. the school does have a vision of the school/madrasah but in its preparation it does not involve many school components and is not replaced regularly. If there is a change in leadership of the principal, the school's vision is not changed. In addition to the vision of the school / madrasah, a school / madrasah mission is also prepared.

Questionnaire data on managerial competency planning aspects of principals were obtained from 20 respondents. The questionnaire has 15 statements. Based on questionnaire data, the lowest ideal score is obtained, 15 and the ideal highest score is 60.

Based on the results of the questionnaire analysis, it could be seen that the managerial competency planning of the principal was categorized very well indicated by an average value of 52.70. The data obtained from the results of 20 respondents, 2 respondents (10%) in "not quite good" category, 3 respondents (15%) in "good" category, and 15 respondents (75%) in "very good" category. Complete can be seen in Figure 1.

The Figure 1 shows that the ability of the principal in managerial planning was in a very good category. This means that the principal's managerial planning ability had a good influence of 75% on school management. The remaining 25% was influenced by other factors.

Another factor that was caused by school principals who were less capable of planning was explained more fully in Adi's research, namely: t: (1) the implementation of principals' managerial competencies in Kuala Kampar State 1 and State SMP 4 has not been implemented properly according to 16 standard indicators managerial competence, (2) inhibiting factors: (a) the principal does not have competency standards; (b) the lack of experience of the principal; (c) inability to prepare school plans; (d) lack of coordination and cooperation; (e) lack of school facilities and infrastructure; (f) lack of training; and (g) lack of supervision from superiors (Adi, 2016, pp. 1-16).

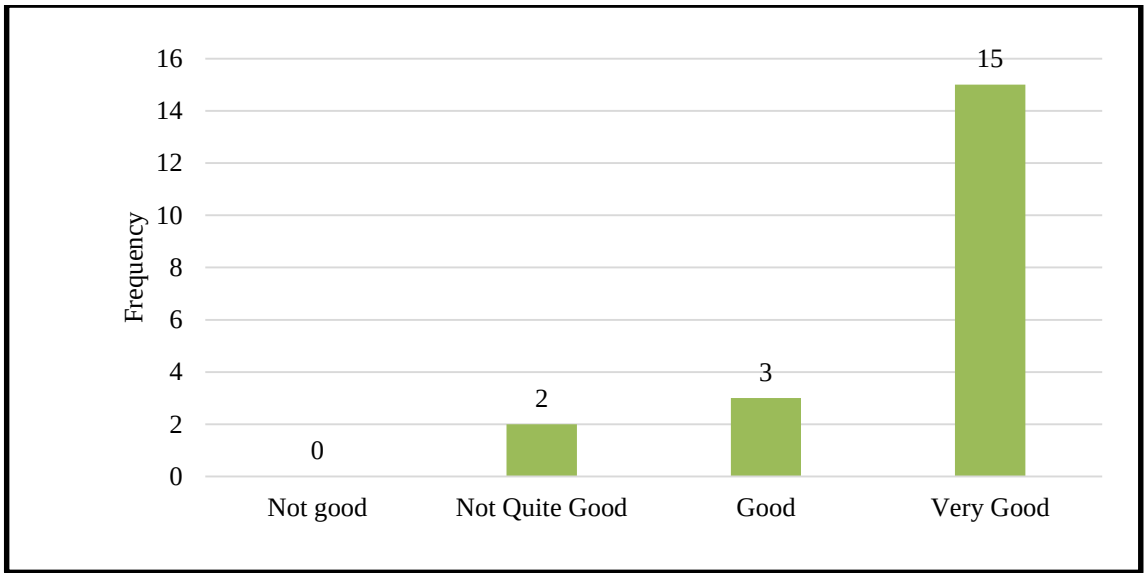

Figure 1. Frequency Distribution of Planning Aspects of Data Results of Principals Managerial Competence

The principal as a manager at a school has a major influence on everything related to school managerial. However, there are also other factors that also influence, including human resources, natural resources, infrastructure, school organizational climate, students' abilities and so on.

In line with the bar chart above, it can also be said that the managerial principal at SMK in Magelang can provide a solution for someone who wants to get education and skills at once, known as Vocational Education, which is explained further:

> *Vocational or technical training or retraining which given in school or classes under public supervision and control or under contract with a State Board or local education agency, and is conducted as part of program designed to fit individuals for gainful employment as semi-skilled or skilled worker or technicians in recognized occupations* (Thompson, 1973, p. 109).

Vocational education certainly must always be developed in line with the demands of the education and workforce in the future. From the results of the comparison of the planning implementation of managerial competencies of principals in related vocational schools, it was found that there was still a gap between the conditions that should be with the actual situation, including: (1) not maximally formulating and developing the vision and mission objectives and objectives of the school maximally, (2) lack of socialization intense to various parties concerned, and (3) no periodic and ongoing review.

Second, data analysis on aspects of implementation which includes school/ madrasah guidelines, school/madrasah organizational structure, implementation of school/madrasah activities, student affairs, curriculum fields, and learning activities, educators and education staff, facilities and infrastructure, finance and funding, the culture and environment of schools/madrasas, community participation and school/ madrasah partnerships are obtained through questionnaires.

Research on the implementation of managerial competencies carried out by Indra obtained results namely: The role of the principal who is dominant in implementing School Based Management (SBM) is a managerial role, because the principal can directly choose who is in the school organizational structure. The role of schools in the context of SBM is a driving force for school life. The role is the principal as an educator, manager, administrator, supervisor, leader, entrepreneur, motivator, and climator. The inhibiting factors in the implementation of SBM are communication that has not gone well in school and lack of socialization for the implementation of SBM, while supporting factors are the active role of school citizens in the implementation of SBM and the

giving of authority or autonomy from the foundation to schools (Lurah & Haryanto, 2014, pp. 174–187).

The results of the study on the implementation of managerial competencies obtained scores Based on the results of the questionnaire analysis above, it can be seen that the managerial competency planning of principals is categorized very well as indicated by an average value of 127.25. Data obtained from the results of 20 respondents, 2 respondents (10%) good categories, and 18 respondents (90%) very good categories, this is stated in the figure in Figure 2.

Figure 2 demonstrates that the implementation of managerial competence of principals was in "very good" criteria, which means it provided good influence on teacher performance satisfaction.

Based on average 127.75 respondents' general tendency score calculation, it was found that there were 2 respondents (10%) in "good" category, and 18 respondents (90%) in "very good" category. Therefore, it indicated principals of the respective schools had implemented well the established standards.

Third, data analysis on aspects of results which include input, process, and output was obtained through questionnaires and interviews. Inputs in the aspects of results in managerial competencies which include infrastructure in general have met the standards of applicable infrastructure. The managerial process of the principal which includes teacher administration that is owned by each teacher includes: making RPP (Learning Implementation Plan), syllabus, and other supporting learning documents. The managerial output of the school principal observed is that the graduates produced are in accordance with the needs of DU/DI so that the level of absorption of graduates is very good. Teacher performance is well monitored and can be seen from good attendance and implementation of learning that is rarely empty. Good teacher performance can have a positive influence on student achievement. The absorption of students in the industry that makes the relationship between schools and DU/DI well interwoven.

Questionnaire data on aspects of the principal managerial competency results were obtained from 20 respondents. The questionnaire has 10 statements. Based on the questionnaire data, the lowest ideal score is 10 and the ideal highest score is 40. The data obtained from the questionnaire can be seen in Figure 3.

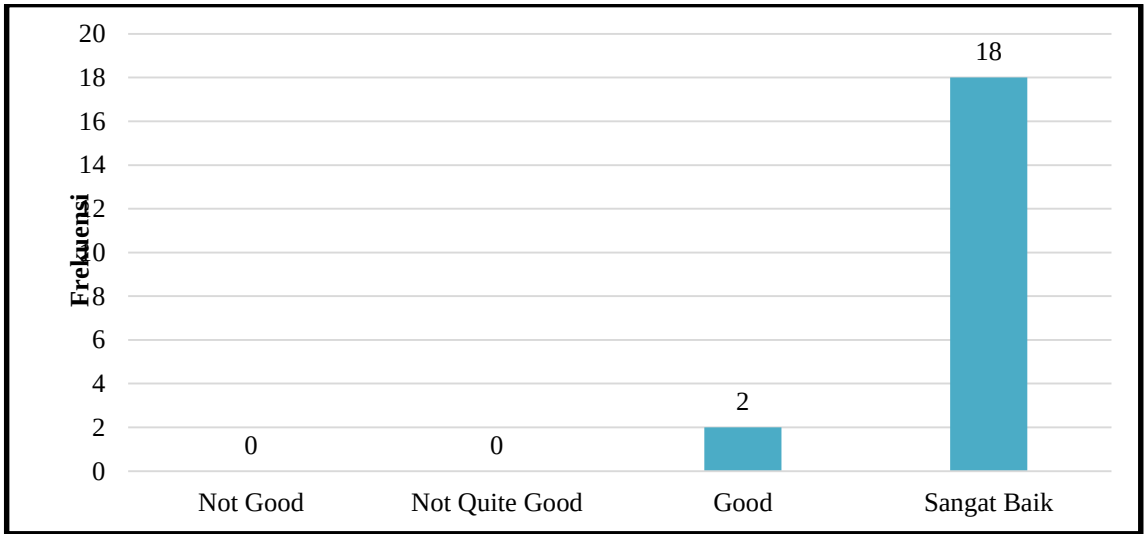

Figure 2. Frequency Distribution of Implementation Aspects of Data Results of Principals Managerial Competence

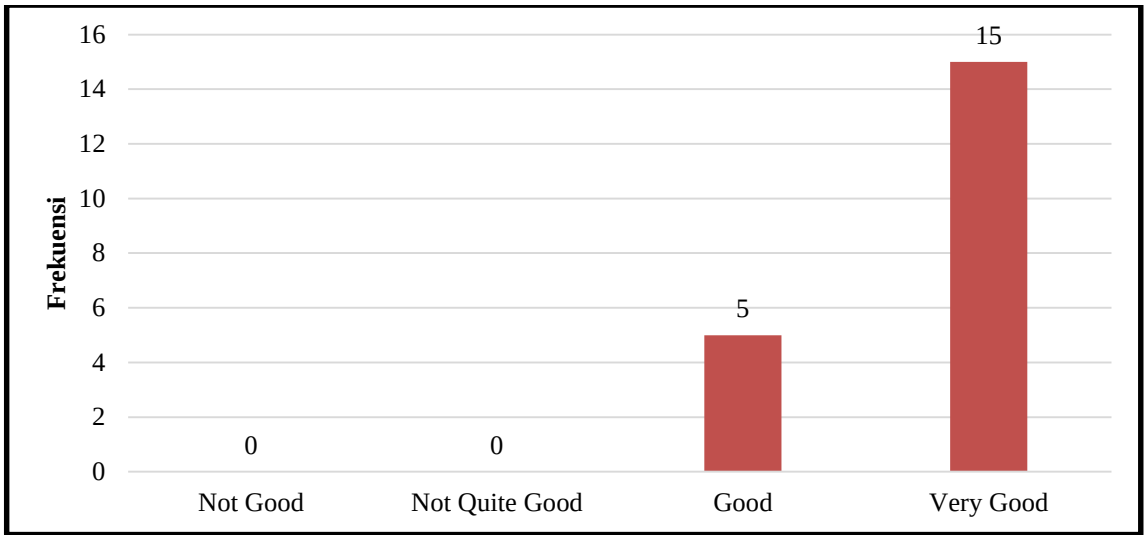

Figure 3. Frequency Distribution of Results Aspects of Data Results of Principals Managerial Competence

From the figure 3, it could be seen that based on the results of the questionnaire analysis, the results of the managerial competence of principals were categorized very well indicated by an average value of 34.20. Obtaining data from the results of 20 respondents, 5 respondents (25%) were in "good" category, and 15 respondents (75%) were in "very good" category.

That data is in line with the research conducted by Arif Jamali namely: contributions given by principals' managerial competencies, school environment, teacher achievement motivation both directly and indirectly to student learning achievement. This means that if the managerial competence of the principal, the school environment and teacher achievement motivation is improved, the quality will contribute positively to the improvement of student learning achievement (Jamali & Prasojo, 2013, pp. 8–21).

The results of Fitriani's research show that: main managerial competencies have a positive and significant effect on citizenship organizational behavior (OCB), primary managerial competencies have a positive and significant effect on teacher productivity, principals managerial competence has a positive and significant effect on interpersonal communication. Interpersonal communication has a positive but not significant effect on civic organizational behavior (OCB), interpersonal communication has a positive but not significant effect on teacher productivity (Harahap & Rusdinal, 2017, p. 1).

The results of the managerial output of the principal included graduates produced, teacher performance, student achievement, and relations with DU/DI. These schools were able to produce graduates that are in line with the needs of DU/DI. They were also able to stimulate teachers to improve performance. Learning achievements of both academic and non-academic students must also increase. In addition, DU/DI's trust in schools increased as evidenced by the absorption of students in DU/DI.

However, from the results of comparative analysis of the results of principals' managerial competency aspects, it was found that: 1) there were several teachers who taught subjects that were not suitable with their educational background, 2) there was no gap between the process and results of implementation of activities, and 3) no there was gaps in output results.

CONCLUSION

Based on the discussion and analysis of research results, it can be concluded as follows:

Managerial competencies of principals of both state and private vocational schools in Magelang were related to the managerial planning ability of the principal, the managerial ability to implement the principal, and the

ability of the principal to achieve managerial results.

First, the aspects analyzed in the planning process were the school's vision, mission and goals. Generally, it was categorized as "very good" with an average acquisition of 52.70 although there were still some gaps such as the vision, mission and goals of the school that had not been maximally developed, there was lack of socialization and there had been no regular improvement.

Second, the implementation of managerial competence in schools covering all elements of the school proved was very well proven with the results of satisfying average score reaching 127.25. Even in this case there was no gap starting from the guidelines for implementation, implementation in accordance with the guidelines, school activities, student activities, implementation of curriculum, infrastructure, and relations with outside parties.

Third, the results of the data processing that the results of the implementation of the principal's managerial competency also showed "very good" category with an average value of 34.20. Some of the outputs of these competencies included graduates produced, teacher performance, students' achievements, and relationships with DU / DI.

From these conclusions, several suggestions arose: managerial competence of principals needed to be improved was the problem of planning, which must increase socialization of HR about work programs, provide training in soft skills and skills, be alert and ready to receive all information from the relevant government, and proactively coordinate with various parties related to LSP.

Then related to the problem of implementation, the school should recruit teachers who could fulfill the needs of the school and in accordance with the required competencies.

Moreover, to improve the results school outputs, dual system education (PSG) which allowed teachers or students to study directly in the industry must be done. Hence, there were coherence between school and industry, adequate infrastructure provision, and education quality improvement.

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AN EVALUATION OF STUDENTS INDUSTRIAL TRAINING COURSES IMPLEMENTATION AT HIGHER EDUCATION

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Abstract

This article aims to reveal the factual basis regarding the implementation of Students Industrial Training (SIT) course by the bachelor's degree students of Hospitality Management Department from the Faculty of Tourism and Hospitality at the University. The methodology used in this study is mixed method with CSE-UCLA evaluation model. The informants in this study were 35 hospitality management students who were graduated in 2015, the SIT Coordinators, Heads of Tourism Departments, and Supervisors, Managers, Industrial Supervisors, senior staffs, and assistance from the Hotel Food and Beverage department. Data of this research were gathered through observation, questionnaires, and interviews. Those data were analyzed by using descriptive statistics technique. The results showed the average score of the need assessment evaluation component was 4.2 (good), program planning was 4.14 (good), formative evaluation was 4.04 (good), and summative evaluation was 3.98 (enough). This Students Industrial Training Program can be continued by improving the students' knowledge, working skills, and English skills, as well as improving the role of supervisors and instructors/ industrial supervisors in monitoring and providing solutions for the students to overcome problems they faced. Furthermore, this training program needed to improve the quality and quantity of relevant campus facilities and infrastructure to the hospitality industry, and increasing the positive attitude of the students in carrying out the industrial training course.
Keywords*: evaluation, implementation, students industrial training course, and students*

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INTRODUCTION

The success of a country is determined by the quality of Human Resources Development (HRD). The quality of human resources can be built by Technical and Vocational Education and Training (TVET) in higher education. One of the higher educations that have vocational education in Indonesia is the State University of Padang (Universitas Negeri Padang/UNP). UNP has eight faculties, and those faculties are divided into various departments. Those departments at UNP are also divided into several programs of study. One of the programs of study at UNP is Hospitality Management.

The Hospitality Management program is a new program of study started since 2009. In the hospitality management curriculum, there is a Student Industrial Training (SIT) course aimed to improve the quality of graduates with skills and abilities. SIT is an intra-curricular activity at the level of undergraduate and Associate Degree courses in all departments at *Fakultas Parawisata dan Perhotelan* Universitas Negeri Padang (FPP UNP) (Unit Hubungan Industri FT UNP, 2013).

The SIT is applied in Students Industrial Courses, Internship or Thesis depending on the students' main program of study. The courses can be taken in odd semester and even semester. The place or industrial company for SIT is selected by the students. SIT activities are carried out by the supervisors from both university and industry. Learning is fundamental social activity — whether in schools, workplaces, or other environments (Pacific Policy Research Center, 2010, p. 6).

The relationship between vocational schools and industry is very important since being able to work in accordance with work skills in industry is the ultimate goal of vocational graduates (Majid & Sudira, 2017, p. 15). Through training in the industry, students are expected to be able to recognize, experience and understand the application of scientific theory and the applications of those knowledge in industry. This training is also done to improve the students' knowledge and skills. Therefore they can become a provision for students a as working experience in accordance with the target profession they wanted to achieved. The core skills of the 21st century and the keys of the student's development characterized by learning and innovation skills, knowledge, information, technology and technology, literacy skills, life skills, and citizenship skills (Pacific Policy Research Center, 2010, pp. 7–8; Utomo, 2018, p. 68).

Based on Unit Hubungan Industri FT UNP (2013, p. 30), students of hospitality management are obligated to take two SIT cours es, namely SIT I in the fifth semester and SIT II in the seventh semester. Before the implementation of SIT, students were given knowledge of practical support (theory) in advance so that in the implementation of the courses students are expected to practice and work independently.

In theory, students who take SIT I are expected to be able to master conceptual knowledge and skills about the hotel operational department, and in SIT II students are expected to be able to master conceptual knowledge and skills about the functions of departments, structural and operational especially in the back of the house (synopsis of SIT courses at Hospitality Management). In addition, students are also expected to have certain competencies, such as mastering theories to support their performance during the training, skills in reading their working instruction, skills in using working tools and equipment during the training program. They are also supposed to have a capacity in working during the timeframe provided, a good quality of training results, good initiation, cooperation, discipline and attendance during training program. Besides, the students need to have good appearance and good adaptation to any situations and conditions during the training (Unit Hubungan Industri FT UNP, 2013).

The place for STI courses can be chosen from the entire hospitality industry in Indonesia. In the hotel industry students are divided based on the selected department. Among the seven departments in the hotel, there are only five departments that can be taken for the STI course. They are Front Office Department, Food and Beverage Department, Housekeeping Department, Accounting Department, Human Resource Department, and Marketing Department. The other two departments namely Engineering Department which requires special skills from students such as knowledge of engineering as well as Marketing Department which requires people who really have experience in the field of Hotel Marketing.

Based on the interview on May 25, 2015 with the Hotel Management students, there are some facts about the SIT courses obtained. Students who took the Front Office Department faced some problems on the implementation of the SIT course. These problems are caused by the lack of knowledge and preparation prior to the STI course. The difference between the knowledge (theory) obtained in institutions and facts that they found in real industrial fields, requires students to extend their knowledge to support their work during the training program. Therefore it would minimize the students' problems during the training. The difficulty of interacting with foreign guests due to the lack of language mastery became another problem during their training. The students who took the front office department are supposed to prepare themselves with good English ability for they know they serve both domestic and international guest who come to the hotel.

Similarly, the students who took the Housekeeping Department encountered problems as well. They should have worked well for every hotel's operational activities. In fact, they are still working awkwardly when they cleaned the room and the hotel environment, since they do not master the techniques and equipment used in the hotel. The students told that they did not fully get the knowledge when they did lectures at the campus. In addition, there were also students who got punishment for smoking in the hotel room in working hours.

The hotel management students who chose the Food and Beverage Service Department also had problems during the training. When they worked, they did not memorized every the equipment used in hotel's restaurant. Besides they also do not master the menu and the type of service provided to guests according to the menu requested by the guests.

The students who chose the back office, such as the Human Resource Department and Accounting Department couldn't choose International hotels, since the hotel set foreign language mastery standards as a ticket to train at the back office. While experience in the Human Resource Department and Accounting Department is very useful for students later as a managerial. On the other hand, students who chose local hotels and took Accounting Department are confused with the system used by the hotel industry. It took several weeks for them to be fluent in doing their work because it was related to the finance. In case of negligence, it would lead to the hotels' financial loss. Apparently, they were supposed to learn one of the systems used at the hotels to manage their finance.

In the Human Resource Department (HRD), students complained that the work they had to do is not in accordance with the education they got in university. Some students cannot perform significant job and the purpose of training in the industry did not meet the purpose. The problems raised by students when implementing SIT were also supported by complaints from hotel supervisors. The hotels complained about the lack ability of students therefore they cannot be allowed to practice independently. This is in line with Almi, Adriani, & Idrus (2013) that showed the implementation of SIT for students of Home Economics at the FPP UNP categorized as low.

Based on the above problems it is necessary to evaluate the implementation of students' industrial training. According to Rossi & Freeman (1985), "Evaluation of research is a systematic application of social research programs in assessing the conceptualization and design, implementation and utility of social intervention programs" (Lastuti & Jaedun, 2014, p. 41). Thus evaluation is a systematic application to assess the implementation and benefits of the program. The benefits of program evaluation are the right decisions on programs that are being or have been implemented (Ananda & Rafida, 2017; Arikunto & Jabar, 2014; Munthe, 2015; Purwanto & Suparman, 1999; Tayibnapis, 2013).

Based on such description then this research is aims to reveal the factual basis regarding the implementation of Students Industrial Training (SIT) course by the bachelor's degree students of Hospitality Management Department from the Faculty of Tourism and Hospitality at the University

RESEARCH METHOD

This research is an evaluation research. Sukardi, 2011, p. 1) defines that "Evaluation is a process which determines the extent to which the objectives have been achieved. (Scriven (2008, p. 65) said evaluation is referred to as a trans-discipline, one that "has standalone status

as a discipline *and* is also used as a methodological or analytical tool in several other disciplines"evaluation The evaluation model of this research is the CSE UCLA model (Center for Study of Evaluation - University California Los Angeles) which consists of Needs Assessment evaluation, Program Planning, Formative Evaluation and Summative Evaluation components." The methodology used in this study is mixed method. Sugiyono (2011, p. 415) tates that mixed method is a research method that combines quantitative and qualitative methods equally, the methods are used together in the same time but answer similar problems independently.

This research was done in the Bachelor's degree of Hospitality Management Program. The informants were 35 hospitality management students who graduated in 2011, SIT Coordinators, Chairmen of Tourism Departments, and SIT Supervisors, 1 Manager, 1 Assistant from Ibis Hotel food and beverage department, 1 supervisor and 1 senior staff of food and beverage department of Basko Hotel, and 5 hospitality management lecturers. The primary data were collected by using: (1) observation, (2) questionnaire, and (3) interviews. Secondary data collection is taken by documentation study. The documentations collected are archives taken during the implementation of SIT. Trial of the questionnaires was given to the students of the Hospitality Management Program. The trial data were analyzed by using the Statistical Product and Service Solution version 16. The results of the trial were then analyzed to determine the validity and reliability of each item in the evaluation and indicators.

The respondents of this study were 35 hospitality management students graduated in 2015, 1 manager, 1 assistance from food and beverage department in Ibis Hotel, 1 supervisor and 1 senior food and beverage staff of Basko Hotel, and 5 hospitality management lecturers. Analysis of the data is done to analyse the average, the level of respondents' achievement, data reduction, data display, and verification (Miles & Huberman, 2013; Ravitch & Tisdell, 2016). The level of respondents' achievement can be analysed by doing a percentage analysis. The qualitative data is presented in narrative.

RESEARCH RESULTS AND DISCUSSION

The Results of Study

The result of CSE-UCLA evaluation program used in evaluating students' industrial training of bachelor's degree students in hospitality management program at FPP UNP will be presented below.

Need Assessment

The evaluation results for need assessment were analyzed through 3 sub-indicators. The results were written quantitatively on Table 1.

Table 1. Recapitulation of respondents' achievement from the evaluation of need assessment

Indicator	Item	Average	Categories
Need Assessment	Improvement of students' knowledge and skills.	4.1	good
	Achievement in industrial Experience	4.3	good
	Improvement and development of students' attitude.	4.2	good
Total Percentage of need assessment's component		4.2	good

From Table 1, the evaluation result of need assessment component reaches the average of 4.2 and Level of Respondent achievement (LRA) 84 %, and categorized as good. The results of qualitative data analysis on the implementation of the SIT program showed some benefits for students. In terms of SIT implementation objectives, respondents stated that basically through SIT students learned to increase knowledge about the hotel industry, become proficient at work, capable in applying their knowledge, have a good working attitude. Therefore the students are ready to enter the real industry.

Program Planning

There are 6 indicators of this component; they are SIT partner industries, students, lecturers and instructors, curriculum, facilities and infrastructure. These indicators are elaborated into 12 sub-indicators, and the result of the evaluation is on Table 2.

Table 2. Recapitulation of Respondents' Achievement from the Evaluation of Program Planning

Indicator	Item	Aver-age	Cate-gories
SIT partner Industries	SIT place observations	4.01	good
	Students' placement	3.63	enough
Students	Students Requirement	4.80	very good
	SIT funding	4.30	good
Lecturers and instructors	Supervisor	3.90	enough
	Instructor from the industry	3,81	good
Curriculum	Expected competence for students	4.40	good
	Semester Credit Hours (SHU)	4.30	good
	SIT period	4.20	good
	SIT Schedule	3.70	enough
Facilities and infra-structure	Facility in University	3,95	enough
	Facility in Industry	4.30	good
Total Percentage of program planning component		4.11	good

From Table 2, the evaluation result of program planning component reaches the average of 4.11 and LRA 84 %, and categorized as good. After making observations and interviews with the industry (Manager Department, Supervisor Department, and Senior Staff) and the university (SIT coordinator for hospitality management, Chairperson of the Tourism Department, and SIT Supervisor), it is found that qualitatively the planning program is good. However, there are some improvement needed in the program, such as students' placement, maximized the role of industrial supervisors and instructors, and a better schedule. July-December period seems to be a better schedule for SIT, because in July-December the hotels has more visitors. In addition, some improvements are needed in relevant facilities and infrastructure to the hospitality industry.

Formative Evaluation

In the formative evaluation component there are 4 sub indicators, namely: SIT implementation activities, industrial working procedure, problems encountered, and the solutions. The results are listed in Table 3.

Table 3. Recapitulation of respondents' achievement from the Formative Evaluation

Indicator	Item	Aver-age	Cate-gories
Implementation	STI activities	4.40	enough
	Industrial working procedure	4.20	good
	Problems encountered	3.74	enough
	Solutions of the problems	3.85	enough
Total Percentage of formative evaluation		4,04	good

In Table 3, the evaluation result of formative evaluation component reaches the average of 4.04 and LRA 80.8 %, and categorized as good. After doing observations and interviews with the partner industry (Manager Department, Supervisor Department, and Senior Staff) and the University (SIT coordinator for hospitality management, Chairperson of the Tourism Department, and SIT Supervisor), qualitatively the formative evaluation is good, some improvement on the students' knowledge, attitudes and skills are needed. The problems during the SIT program were caused by students who were not seriously doing the SIT implementation. The students are also lack of .knowledge and skills need in the industry. Similarly, the solution to solve the problem has not been maximally given by the supervisor and instructor from the industry.

Summative Evaluation

In summative evaluation there is one indicator that is the achievement of the SIT objectives. It has 2 sub indicators, namely: the levels of satisfaction with the results obtained quantitatively are listed in Table 4.

Table 4. Recapitulation of respondents' achievement from the Summative Evaluation

Indicator	Item	Aver-age	Cate-gories
Objective Achieve-ment	results achieved	4.20	good
	levels of satisfaction	3.76	enough
Total Percentage of summative evaluation		3.98	enough

In table 4, the summative evaluation has an average of 3.98 and LRA 84 %, and categorized as enough. Based on observations and interviews from both the industry (Manager Department, Supervisor Department, and Senior Staff) and the University (SIT coordinator for hospitality management, Chair of the Tourism Department, and SIT Supervisor), the summative evaluation is good enough. However, the satisfaction of students and hotel industry needs to be improved

Discussion

Needs Assessment

The research findings of the students' need assessment showed good results. This is in accordance with the objectives of the industrial training for students, which is to help students to maximize learning, especially skills related to the competence of their majors (Presiden Republik Indonesia, 1992). In fact, this program is needed by students and the industry as well. This is also supported by the opinion of Djojonegoro (1999) who say that the concept of link and match on vocational education is basically meant that the world of education serves as an institution that prepares human resources, while the community and the industrial world serves as those who need it.

Program Planning

The findings for this evaluation component indicated good results. According to Alkin (1969, p. 4) the program planning aims to help the selection of certain programs that might meet the needs of the program. In accordance with this theory, it can be interpreted that the evaluation of the elements in the implementation of the SIT program helps to determine the success of the SIT program implementation.

The improvement of the elements related to the SIT program is aimed at improving the quality of each element so that the objectives of the plan can be achieved perfectly. This is supported by the opinion of Fernades in Arikunto & Jabar (2014, p. 44) who state that evaluation of programs planning is carried out by collecting related data directly to the program being evaluated. Therefore this will lead to fulfill the needs and objectives of program implementation.

The results of program planning evaluation still need improvements in student placement. The placement of SIT students is adjusted with their abilities, skills, motivation and economic conditions. It will support students to practice well. Students will do their work carefully, seriously, and happily. This will increase their performance, then, they can make the industry feel assisted, thus the industry always asks hospitality management to send SIT students.

Similarly, the role of supervisors and industrial instructors for SIT students have not been implemented optimally. This is proved by the lack of attention on the student monitoring system. SIT students should be accompanied to the industry by lecturers, monitored in the middle of the SIT period and accompanied at the end of the industry schedule. Regarding supervisors, according to Unit Hubungan Industri FT UNP (2013, p. 6) supervisors are expected to provide guidance to students, such as planning SIT activity programs in the industry, placement in related units, SIT report writing, and evaluating the progress that has been achieved by students during the training. Supervisors guide students in the industry to be able to observe every implementation of SIT activities in the units that have been decided by the industry. The goal is that students are able to work appropriately and effficiently. If supervisors guide students accordingly, there will be a good working relationship between supervisors and SIT students. Thus, students feel comfortable and do their responsibility and work precisely.

Regarding the curriculum, there was knowledge that students have not been aware of on campus, but are needed in the industry such as knowledge about food and beverage, houskeeping equipment, front office, human resource management, purchasing, and accounting. Lecturers need to provide this knowledge to students so that SIT activities will be implemented properly. While there are some skills learned in the campus are not suitable with the needs of the industry. There are even skills that have not been taught, such as cleaning public area by using machines, making beds without using dufe, and cleaning techniques using chemical equipment. According to Sudijono (2005, p. 57) "Skill is related realm with ability to act after someone receives a certain study experience".

The existing facilities and infrastructures in university have not met the need of the industry. The quality is still low and the quantity is not sufficient, making it less relevant and supportive in implementing SIT.

The SIT implementation schedule is appropriate, but it will be better if it is done in the July-December period, because in July-December the hotel has more guests than other period. Hence, it suits the needs of the industry. Meanwhile, the University in the July-December period sent SIT students to the Back Office. It implied the gap of the schedule between industry and the University.

Formative Evaluation

Research findings for the formative evaluation showed good results. SIT students who have been accustomed to their work. There were no students who did not work as their job description at each department. Even if they were rolled to another department students were able to adjust their work to their part. Likewise, students are able to work as the industrial working system. Although there were one or two students who complained because they are objected to follow the working system in the industry, but it could be resolved properly.

Students are indicated to do a good work when they work as the Standard Operational Procedure (SOP). The working system in the industry is working shift and team. According (Suma'mur P.K. (1994, p. 34) shift is a pattern of work time given to employees to carry out something by the company and usually consists of morning, and shift. While, team work is a group consisting of two or more people who influence and depend on one another who unite to achieve certain targets (Coulter, 2004, p. 5). In working, the SIT students in the team work together with other employees to do all the work.

In implementing SIT, there are obstacles and problems. One of them is students' attitude. It is derived from the students' performance. The students are not only indiscipline, but also did not suit to the hotel standards. Students tend to be picky in doing jobs, and students are neglectful in their work. The other problem is the lack of student knowledge. Students are not able speak English, and their understanding of food and drinks is low. Even so, students have been given practical courses in advance. According Sudijono (2005, p. 57) "Skills are fields related to the ability to act after a person receives a particular learning experience".

The role of the instructor / supervisor of the hotel industry is able to asist students in SIT program effectively. According to Unit Hubungan Industri FT UNP (2013, p. 6) supervisors are expected to provide guidance to students, such as planning SIT activity programs in the industry, placing students in related units, writing SIT reports, and evaluating the progress made by students in the training. Supervisors guide SIT students in the industry to be able to observe every work acivities that have been determined by the industry. According to Unit Hubungan Industri FT UNP (2013, p. 5) SIT supervisors should provide advise on guidelines of SIT implementation, help students solve problems encountered during the training, guide students to arrange their programs, and make SIT reports, evaluate and determine score for students' performance, report the students' score to Unit Hubungan Industri FT UNP office. Effective teachers must be able to interact with students (Ayebo & Assuah, 2017). Ideally SIT supervisors are supposed to assist students from going, monitoring, to returning home from industry. This happens because the supervisor is aware of the SIT development.

Summative Evaluation

The findings for formative evaluation showed good results. Based on the analysis, the satisfaction level is in the sufficient category. Qualitative data indicate that the industry is satisfied with the implementation of the SIT students since industry feels assisted by this program. While the universities, especially Hospitality Management feel quite satisfied with the implementation of SIT, because students have gained abilities, skills, and built their attitude as well as their industrial experience.

CONCLUSION

The Industrial Training for bachelor's degree students of hospitality management has been implemented well. Nevertheless, there are several aspects that need to be improved included the students' knowledge, skills and positive attitude for the SIT courses. Similarly,

the role of university supervisors and industrial instructors are not optimal. Besides, the quality and quantity of facilities and infrastructure in the university need to be upgraded. The level of satisfaction of SIT students is considered sufficient.

Below are the recommendations for the implementation of SIT. Fisrt, the hospitality Management students need to improve their knowledge, skills and positive attitudes in participating in SIT and set themselves up with English skills. Second, increasing the role of industrial supervisor as well as the university supervisors to overcome the problems faced by students in implementing SIT and make the program run efficiently.

Third, it is recommended for the hospitality Management lecturers to be given training and internships to the industry in order to make the skills and knowledge that will be given to students equal with industrial needs, since some lecturers do not have a background in Hospitality Management. Fourth, improving the quality and quantity of facilities and infrastructure that are relevant to industrial needs.

Fifth, the curriculum material is needed to revised to make it relevant to industrial needs. Sixth, the hospitality Management Department is recommended to review the implementation of SIT course, such as the choice of implementation schedule that suits the needs of the industry. Seventh, students' satisfaction in implementing SIT needs to be improved by providing good service, so that the hotel is assisted by the students' work and feel satisfied.

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INFLUENCE OF LEARNING MEDIA BASED ON ADOBE FLASH PROFESSIONAL TO PSYCHOMOTOR DOMAIN LEARNING OUTCOMES ON PLC COURSES VIEWED FROM LEVEL OF CREATIVE THINKING STUDENT

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Abstract

This study uses adobe flash professional based learning media for experimental class while in control class using CourseLab media. Learning media based on adobe flash professional designed in the form of applications for smartphones and computers or notebooks. This study aims to determine the interaction and differences in learning result for students who have low and high creative thinking level who learn by using adobe flash professional media than students who use the media CourseLab. This research was conducted in department D3 mechatronic class of 2015 at State University of Trunojoyo Madura (UTM) on PLC course and using factorial design 2 x 2, with total of students in the experimental class as much as 44 people and total of students in the control class as many as 26 people. Data Processing Technique for hypothesis testing, used two-independent-samples test technique. If the prerequisite test of normality and homogeneity is not met, we will use the mann-whitney u test technique. Research finds: (1) for students who have a low level of creative thinking, who learn by using adobe flash professional learning media, psychomotor domain learning outcomes is significantly higher than students who learn by using instructional media CourseLab; (2) for students who have a high level of creative thinking, who learn by using adobe flash professional learning media, psychomotor domain learning outcomes is significantly higher than students who learn by using instructional media CourseLab; and (3) there is a significant interaction between the level of students' creative thinking and learning media, to psychomotor domain learning outcomes. Research suggests: (1) research subjects used at least more than 150 students, to obtain better data (normal distributed data); and (2) the preparation of tools and materials must be in accordance with the needs to be used, so that the quality of learning is increasing.

Keywords: *learning media, adobe flash professional, level of creative thinking, and programmable logic controller (PLC)*

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INTRODUCTION

Education has a very important position in the development of a country. Good and quality education can create competent and quality human resources. Based on Law no. 20 of 2003 on National Education System (Presiden Republik Indonesia, 2003), article 3 explained that "National education aims to develop the potential of learners to become human beings who believe and cautious to God Almighty, have a noble character, healthy, knowledgeable, capable, creative, independent, and responsible". Thus to achieve a stable economy requires great attention to the achievement of a competitive position in the world market. It's important to look at the ways, how creative thinking can enrich the economic potential. Expected through education, human resources Indonesia has a creative thinking to be ready to compete in the world of work.

National education standards require creative learning models and media, so that lecturers as educators play an important role in implementing the learning process in universities, in order to develop the potential and creativity of students. In relation to this, the learning process needs to be designed and implemented in such a way, including the use of instructional media. One of the facilities and infrastructure that can be used for creative learning process, namely interactive multimedia and e-learning. According to Daryanto (2010, p. 51) interactive multimedia is a multimedia equipped with user-operated controller tools, so the user can choose what is desired for the next process. Learning media based on e-learning is also very needed by students in doing learning activities. Furthermore Daryanto (2010, p. 168), explained that, E-learning is a learning system that utilizes electronic media as a tool to help learning activities. One of the interactive multimedia and e-learning that can be used for PLC courses that is adobe flash professional-based media. Adobe flash professional software is one of the software that can make learning media based on animation, game and simulation.

Students need media support in lecturing process, so that instructional media become an important foundation in influencing student learning outcomes. The facts so far indicate that most of the media used in universities, is still one way. In connection with this, it is necessary to do research about the utilization of adobe flash professional based media. The first step, made initial observations at the University of Trunojoyon Madura (UTM) on the D3 Mechatronics Engineering. The lecturer concerned argued that: (1) in the learning process of PLC courses using CX-Programmer simulation media, has not fully optimized the learning process for the students, because the CX-Programmer software developed by omron is a heavy software in its use and requires computer with high specification; (2) the students do not all have a computer, so it needs supporting media that can cover the weakness of the software CX-Programmer easy in its use, in order to happen interactive learning process; and (3) to optimize the CX-Programmer software required support animation-based media and simulation, so as to create efficient, meaningful and interactive learning.

Based on the results of these initial observations, media required with the following specifications: (1) made with adobe flash professional software; (2) generated media in the form of dot html (.html), dot swf (.swf), and dot apk (.apk); (3) completed with a file material that can be downloaded online; (4) has an easy-to-use menu and submenu; and (5) equipped with accompanying music. When compared with previous research, this research has novelty that include: (1) difference of adobe flash professional learning media influence compared to learning media of CourseLab; and (2) the interaction between the level of creative thinking with learning media.

Based on the above description of the background, the formulation of the problem in this research are: (1) is there any difference of psychomotor domain learning result between students who have low level of creative thinking, learning by using adobe flash professional learning media compared to students learning by using instructional media CourseLab ?; (2) is there a difference in psychomotor domain learning outcomes between students who have high level of creative thinking, learning by using adobe flash professional learning media compared to students learning by using CourseLab? (3) is there an interaction between the level of creative thinking and learning media, to the learning outcomes of the psychomotor to programmable logic controller courses?.

Based on the formulation of the problem, the purpose of this study is to: (1) analyze

difference of learning result of psychomotor domain for student who have low level of creative thinking learning by using adobe flash professional learning media compared to student learning by using learning media CourseLab; (2) analyze the difference of psychomotor domain learning result, for students who have high level of creative thinking that learn by using adobe flash professional learning media compared to student learning by using learning media CourseLab; and (3) analyzing the interaction between the level of creative thinking and learning media, to the learning outcomes of psychomotor in the subjects of programmable logic controller.

Media

Heinich & Russell (1982, p. 15) states that the media is functioning as an intermediary that delivers information between the source and the recipient. Television, films, photographs, radios, audio recordings, projected images, printed materials, and the like are media used as a medium of communication. Meanwhile, according to Kozma (1991, p. 8), that the media is a technology that facilitates students in learning, so it can affect the learning outcomes. While Munadi (2013, p. 7), considers that the media is anything that can deliver and deliver messages from sources in a planned manner, so as to create a conducive learning environment in which recipients can make the learning process efficiently and effectively.

Munadi thought, in line with: (1) the results of the research by Nopriyanti & Sudira (2015, p. 234) who found that interactive multimedia learning basic competencies in the installation of lighting systems and electrical wiring was very effective for improving student learning outcomes; (2) the results of Mantasia & Jaya (2016, p. 290) research which found that Augmented Reality technology for productive subjects with the scientific approach, can improve learning outcomes in the cognitive, affective and psychomotor domains; and (3) the results of the research by Wirawan, Indrawati, & Rahmanto (2017, p. 85), who found that the use of digital archival learning media, effectively improved student learning outcomes.

Futhermore Munadi (2013, p. 153), explains that to design and produce interactive multimedia program, please note the following matters: (1) the criteria of ease of navigation, where the program should be designed as simple as possible, so students do not need to learn computer first; (2) criteria of cognitive content, in which the content of the program must provide the learning experience of the cognitive domain required by the student; (3) knowledge and information criteria; (4) criteria of media integration, in which the media must integrate several other aspects and skills to be learned; (5) interactive learning should place emphasis on integrating various language skills, listening, speaking, writing and reading; (6) to attract students, the program must have an artistic appearance, then aesthetics is also a criterion; and (7) the last performance criterion is the overall function. The program developed should give the students the desired learning in its entirety, so that when a person finishes running a program he / she will feel he has learned something.

In multimedia presentation, according to Green & Brown (Munir, 2013, p. 112) there are several methods used: (1) paper-based, eg books, magazines, brochures; (2) light-based, eg slide shows, transparencies; (3) sound-based (Audio-based), eg CD Players, tape re-corders, radio; (4) Moving-image-based, for example: television, VCR (Vidio cassette recorder), film; and (5) digital based (Digitally-based), eg computer. The process flow interactivity between multimedia as shown in Figure 1.

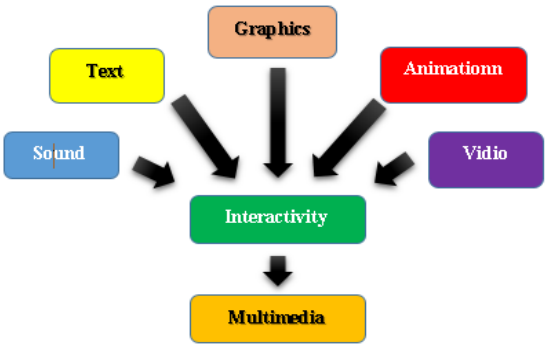

Figure 1. Multimedia Interactivity Process

In terms of understanding, Huddleston (2010, p. 33) explains that "Flash Professional" is a full-featured vector-based design tool. The program includes a set of tools for drawing and creating animations with the help of timeline. Meanwhile, according to Wahana Komputer (2012, p. 2) adobe flash professional is an animated object maker, making presentation, animation ads, games, supporting animation web

page, so it can be used for animated film making.

The latest features in adobe flash professional are: (1) provide support for HTML 5; (2) rapid export of symbols and animation sequences to generate sprite sheets to enhance gaming experience, workflow, and performance; (3) provide support for Android and iOS with the latest adobe flash player; and (4) perfomanya gives the loading of large images to be faster. This is realized thanks to the adobe mercury graphics engine that is able to minimize rendering time.

Learning Outcomes

Anderson & Krathwohl (2010, p. 31) have successfully developed a taxonomy of learning outcomes by revising the taxonomy into a teaching-learning and assessment taxonomy. Taxonomy includes two dimensions of the cognitive process dimension (cognitive processes) and the dimension of knowledge (knowledge). The learning outcomes of the cognitive domain includes 6 (six) levels: (1) remembering; (2) understand; (3) apply; (4) analyze; (5) evaluating; and (6) create. Furthermore, Anderson & Krathwohl (2001, p. 32) suggest five hierarchies in the affective domain learning result of receiving, responding, give valuing, orgating, and characterizing a value. Accepting is the ability to pay attention to an activity or event at hand. Responding is the provision of reactivity to an activity by involving themselves or participating in it. Values are strongly related to the act of accepting or rejecting the values or norms encountered through an expression of positive or negative attitudes. Organizing means identifying, selecting, and deciding on the value or norm to be applied. Giving character to value means believing, practicing, and demonstrating behavior that is consistent with the values and norms learned. Assessing the competence of skills can be done through observing activities, asking, trying, and reasoning, tasting, and creating. Psychomotor domains, according to Krathwohl, Bloom, and Kibler (Tomei, 2005, p. 58), consist of five ranks: (1) imitation; (2) manipulating; (3) precision; (4) articulation; and (5) naturalization.

Level of Creative Thinking

According to Torrance (1965, p. 9), that creativity is: (1) as a process of feeling and dealing with a problem; (2) it is necessary to make an assumption about the answer to a problem; (3) to identify difficulties in finding answers to a problem; (4) finding solutions and making conjectures, or formulating hypotheses in response to a problem; (5) assess and test such allegations or hypotheses; (6) then change the hypothesis and test it again, so find the answer or the result. This definition describes as a natural process and the human needs involved at each stage of problem resolution.

Accordingly, Silver (1997, p. 182) describes that creative people in high-order thinking seem to have a creative character and orientation to their activities. Meanwhile, according to Marrapodi (2003, p. 28), that creativity is often defined as an idea parallel to intelligence, but different from intelligence. Creativity is, not limited to cognitive or intellectual function or behavior. Conversely, creativity relates to a mixed condition of complex motivation, personality factors, environmental conditions, accidental factors, and even products. Creativity is a meeting of six different components, but is interrelated, including intellectual ability, knowledge, thinking style, personality, motivation, and environment (Sternberg, 2006, p. 43).

In contrast to the above three opinions, Paul & Elder (2008, p. 21) describe that creative implies an important component (eg "owning or displaying imagination and artistic or intellectual inventiveness"). Creativity is high-quality thinking contextually in an environment and can produce products (European University Association, 2007, p. 7). Siswono (2008, p. 6) explains that creative thinking is a process that is used when we come up with a new idea. It combines previously unheard of ideas, while Munandar (2014, p. 19) considers that creativity is a way of life, a way of perceiving the world.

Measurements on creativity are numerous, including in this study in order to measure the level of students' creative thinking. One tool used to measure the level of one's creative thinking is to use Torrance Tests of Creative Thinking that have been created by Torrance. Kaufman & Sternberg (2010, p. 53) revealed that there are seven verbal subtes including: (1) Asking; (2) Guessing Causes; (3) Product Improvement; (4) Unusual Uses; (5) Unusual Questions; and (6) Just Suppose. Meanwhile, according to Munandar (2014, p. 43), the creativity scoring scheme used in composing in-

volves four criteria of creative thinking: fluency, flexibility, originality (orosinality), and elaboration. Each of the four criteria consists of five components, so that there are 20 items that need to be assessed. For each eligible item, a score of 1, so the maximum score a person can get is 20.

While Silver (1997, p. 76) agrees with Torrance, that creativity judgments can use "The Torrance Tests of Creative Thinking (TTCT)". The creativity assessment used on TTCT is based on three key components including fluency, flexibility, and novelty.

RESEARCH METHODE

This research uses experimental research method. According to Sukardi (2012, p. 179) experimental research method is the most productive research method, because if the research is done well can answer the hypothesis that primarily related to causality. In addition, experimental research is also one form of research that requires relatively more stringent conditions when compared with other types of research. This is in accordance with the intent of the researchers who want a certainty to obtain information about which variables cause something to happen and the variables that result from the change in an experimental condition. The research design used intact-group comparison with the factorial model as shown in Figure 2.

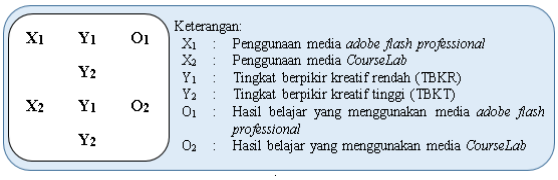

Figure 2. Intact-group comparison with factorial model

Montgomery (2013, p. 233) explains that a complete design requires a 2×2× ... ×2 =2^ k design called the factorial design 2^k. Accordingly, Suryabrata (2013, p. 111) explains that the simplest factorial random is that using two factors, and each factor uses two categories. This stage is a measure of the presence or absence of differences in learning outcomes between students who have high and low creative thinking levels taught by using adobe flash professional-based learning media, and students who are taught by using CourseLab media, and the presence or absence of interaction between the level of thinking creative with adobe flash professional based learning media on student learning outcomes in the course of Programmable Logic Controller (PLC).

Table 1. Design of Research Analysis

Learning Media (B)	Level Creative of Thinking (A)	
	High Level of Creative Thinking (A_1)	Low Level of Creative Thinking (A_2)
Learning media based adobe flash professional (B_1)	Learning Outcomes (B_1) (A_1)	Learning Outcomes (B_1) (A_2)
CourseLab Media (B_2)	Learning Outcomes (B_2) (A_1)	Learning Outcomes (B_2) (A_2)

Description:

1. **B_1 A_1** is the result of student learning that has a high level of creative thinking who learned by using adobe flash based professional learning media.
2. **B_1 A_2** is the result of studying students who have a low level of creative thinking who learned by using adobe flash based professional learning media.
3. **B_2 A_1** is the result of student learning that has a high level of creative thinking that is learned by using CourseLab media.
4. **B_2 A_2** is the result of student learning which has low creative thinking level which is learned by using CourseLab media.

To test the hypothesis required data analysis techniques. The data analysis technique used is parametric statistic if assumption test is met, and if assumption test not fulfilled, must use non parametric statistic which can be explained as follows: (1) Test Prerequisites, in this study used Levene test as data homogeneity test and Kolmogorov-Smirnov test as data normality test; (2) Test Hipotesis, If the preconditions are met, then hypothesis testing uses Independent-Samples T-Test and if not met then, using Mann-Whitney U Test.

RESEARCH RESULTS AND DISCUSSION

The result of interview with Head of Department of Mechatronics D3, Trunojoyo University of Madura (UTM) as shown in Table 2.

Table 2. Interview Result with Head of Department of Mechatronics D3, Trunojoyo University of Madura (UTM)

No.	Questions Researcher	Respondents Answer	Description
1	What learning media is used in the learning process in the course of PLC in D3 Mechatronics Study Program?	Software CX-Programmer	Respondents' answers are clear
2	How is the media deficient?	Software pretty heavy and requires a computer / notebook with a pretty good specification	Respondents' answers are clear
3	What problems arise if using the media?	Because the software CX-Programmer is a heavy software in its use and requires a computer / notebook with a pretty good specification, so it still needs learning media to equip it	Respondents' answers are clear
4	Whether in the learning process in the PLC courses in D3 Mechatronics requires other media, if need how the specifications?	Yes it requires, (1) there is animation; (2) media can be opened computer, notebook, and smartphone; (3) the medium is not heavy in its operation; (4) has a menu and sub menu that is easy to use; (5) can be accessed online	Respondents' answers are clear

Assessment of the level of creative thinking of students is done once each time in the experimental class and control class, by giving test question description characterized by multiple solution task. The assessment includes fluency, flexibility, and renewal. The results of the assessment are shown in Table 3.

Table 3. Criteria of Student Creative Thinking Level (LOCT)

Catagory LOCT		Total of Student	
		Experiment Class	Control Class
Students who have HLOCT	LOCT 4	16	7
	LOCT 3	3	5
Students who have LLOCT	LOCT 2	16	2
	LOCT 1	6	9
	LOCT 0	3	3
Total N		44	26

Table 3 shows that the students in the experimental class who get the criteria of high creative thinking level amounted to 19 students and the control class were 12 students. For the criteria of students who have low creative thinking level in the experimental class is 25 students and the control class is 14 students. Furthermore, these criteria, processed into groups for testing the hypothesis. The average grade of students' creative thinking level is shown in Table 4.

Table 4. Average Score of Student Creative Thinking Level

Learning Outcomes	Class	Mean
Psychomotor domain learning outcomes for students with LLOCT	Experiment	88,28
	Control	85,00
Psychomotor domain learning outcomes for students with HLOCT	Experiment	85,64
	Control	80,50

Against the psychomotor domains of learning result, assumption test (normality test and homogeneity test). The result of normality test and homogeneity test of psychomotor domain learning result, as shown in Table 5.

Table 5. Test Results of Normality and Homogeneity

Research Data	Normality Test Results	Homogeneity Test Results
Data of psychomotor domain learning outcomes	The data is not normal	Homogeneous data
Data of psychomotor domain learning outcomes for student with LLOCT	The data is not normal	Homogeneous data
Data of psychomotor domain learning outcomes for student with HLOCT	The data is not normal	Homogeneous data

Because the data is not normally distributed, the hypothesis testing is performed using nonparametric statistics, ie by using Mann-Whitney U Test and Friedman Test. Hypothesis testing is done as follows.

Hypothesis Testing 1

$H_0: \mu_{B_1A_2} \leq \mu_{B_2A_2}$
$H_1: \mu_{B_1A_2} > \mu_{B_2A_2}$

Table 6. Statistical test[a] of Psychomotor Domain Learning Outcomes for Students with LLOCT

	Psychomotor Domain Learning Outcomes for Students with LLOCT
Mann-Whitney U	68.500
Wilcoxon W	159.500
Z	-3.057
Asymp. Sig. (2-tailed)	.002
Exact Sig. [2*(1-tailed Sig.)]	.003[b]

a. Grouping Variable: Class used research

b. Not corrected for ties.

Sources: Software SPSS v.23

Table 6 shows that the probability value for the two-sided test (sig-2-talled) based on the Mann-Whitney U statistic is $\rho = 0.002$, which means value $\rho < 0{,}05$ with a very significant status. Therefore H_0 rejected, and $H_1: \mu_{B_1A_2} > \mu_{B_2A_2}$ which reads, "Psychomotor domain learning outcomes for students who have low level of creative thinking, who learn by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media", are accepted.

Hypothesis Testing 2

$H_0: \mu_{B_1A_1} \leq \mu_{B_2A_1}$
$H_1: \mu_{B_1A_1} > \mu_{B_2A_1}$

Table 7 shows that, the probability value for the two-sided test (sig-2-talled) based on the Mann-Whitney U statistic is $\rho = 0.016$, which means value $\rho < 0{,}05$ with significant status. Therefore H_0 rejected, and $H_1: \mu_{B_1A_1} > \mu_{B_2A_1}$ which reads, "Psychomotor domain learning outcomes for students who have high level of creative thinking, who learn by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media", are accepted.

Table 7. Statistical test[a] of Psychomotor Domain Learning Outcomes for Students with HLOCT

	Psychomotor Domain Learning Outcomes for Students with HLOCT
Mann-Whitney U	58.000
Wilcoxon W	136.000
Z	-2.409
Asymp. Sig. (2-tailed)	.016
Exact Sig. [2*(1-tailed Sig.)]	.023[b]

a. Grouping Variable: Class used research

b. Not corrected for ties.

Sources: Software SPSS v.23

Hypothesis Testing 3

$H_0: \mu_A = \mu_B$
$H_1: \mu_A \neq \mu_B$

Table 8. Statistical test[a] of Interaction between LOCT and Learning Media to Psychomotor Domain Learning Outcomes

N	26
Chi-Square	21.476
df	3
Asymp. Sig.	.000

a. Friedman Test

Sumber: Software SPSS v.23

Table 8 shows that the probability value for the test based on Friedman Test statistics is equal $\rho = 0.000$, which means value $\rho < 0{,}05$ with a very significant status. Therefore H_0 rejected, and $H_1: \mu_A \neq \mu_B$ which reads, "There is a significant interaction between the levels of creative thinking and learning media on psychomotor domain learning outcomes "is accepted.

Furthermore, about the interaction between the independent variable and the moderator variable to the dependent variable, as shown in Figure 3.

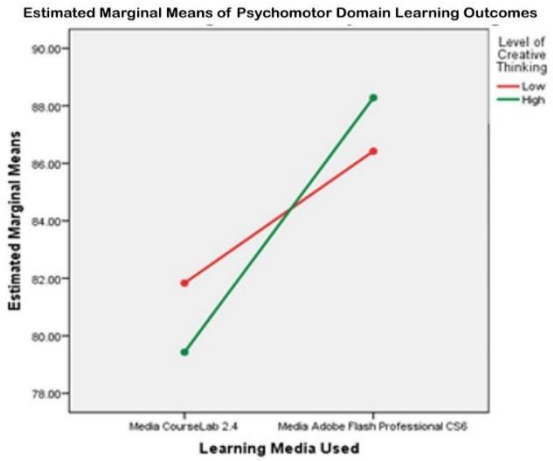

Figure 3. There is a very significant interaction between the level of creative thinking and learning media to the psychomotor domain (SPSS v.23)

The results showed that: (1) psychomotor domain learning outcomes, for students who have low level of creative thinking, learning by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media with $\rho = 0.002$; (2) psychomotor domain learning outcomes for students who have high level of creative thinking, learning by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media with $\rho = 0.016$; and (3) there is a very significant interaction between the level of students' creative thinking and learning media, to psychomotor domain learning outcomes with $\rho = 0.000$.

The results of this study, similar to the results obtained by Zhang (2015, p. 122) through his research entitled "Interactive Multimedia-Based E-Learning: A Study of Effectiveness", found that students in the learning environment use interactive multimedia based e-learning, fully achieve better performance and higher levels of satisfaction than students in the traditional classroom, which in their learning environment is less interactive with e-learning.

The findings of this study are consistent with the findings of Sun & Cheng (2007, p. 182) through his research entitled "The design of instructional multimedia in e-Learning: A Media Richness Theory-based approach", which found that in the learning process there was an increase in outcomes significant learning for students using multimedia e-Learning.

The findings gained through this study, similar to the findings of Nazir, Rizvi, & Pujeri (2012, p. 77) through his research entitled "Skill development in the Multimedia Based Learning Environment in Higher Education: An Operational Model", which found that when creative education based issues that are packed with interactive and targeted multimedia will help learners so that: (1) skills are improved; (2) the learning time is reduced; and (3) its performance increases.

The results of this study, in parallel with the results obtained by Leow & Neo (2014, p. 53) through his research entitled "Interactive Multimedia Learning: Innovating Classroom Education in A Malaysian University", found that: (1) there was an increase which is significant in the psychomotor community learning outcomes of the students; and (2) students also exhibit positive attitude changes, so they become more active and motivated in the learning process.

The findings of this study are similar to Surjono's (2015, p. 98) findings through his research entitled "The Effects of Multimedia and Learning Style on Student Achievement in Online Electronics Course", which found that students whose multimedia preferences and learning styles corresponded to the way the material was presented in an online electronic course, students have significantly higher psychomotor domain learning outcomes than other learning models.

CONCLUSION

From the research that has been done found that: (1) psychomotor domain learning outcomes for students who have low level of creative thinking, learning by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media; (2) psychomotor domain learning outcomes for students who have high level of creative thinking, learning by using adobe flash professional learning media, significantly higher than students learning by using CourseLab learning media; and (3) there is a very significant interaction between the students level of creative thinking and learning media, to the students' psychomotor domain learning

outcomes in the programmable logic controller course.

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TOURISM VOCATIONAL HIGH SCHOOL STUDENTS' AND TEACHERS' PERCEPTION OF FOREIGN LANGUAGES IN COMMUNICATIVE COMPETENCIES AND THE 21ST CENTURY SKILLS IN YOGYAKARTA

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Abstract

This study investigated how is the perception of high school of vocational in tourism program study students in communicating foreign language and revealed the competence in twenty-first century skills. There are about 125 respondents who participated out from 150 survey spread on the vocational high schools that held tourism program study in Yogyakarta involving the teachers and students. The data were collected through comprehensive questionnaire. The results shown that the subjects had following in common and compared result to the teachers shown that perceptual matches and mismatches between the two groups. Through One-Way ANOVA test (P<0.05), there found 7 items in communicative competence that significantly difference in students perception and 18 items on 21st century skills. Meanwhile, the perception between students and teachers, there found 9 items that significantly difference.

Keywords: *perception, communicative competence, twenty-first century competence*

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INTRODUCTION

One of tourism area that targeted by international tourists in Indonesia is Yogyakarta, even though there are several sectors already well-established in part of other provinces. Yogyakarta is the leading city among others in establishing its tourism sector. Yogyakarta is the third tourism destinations after Bali and Jakarta (Hermayati, 2007). MP3EI or Master Plan for the Acceleration and Expansion of Indonesian Economic Development which projected to 2025 is also support the The Java Economic Corridor has a development theme as "National Industry and Service Drivers", stretching from Yogyakarta as the tourism gate to Solo, Bali until West Nusa Tenggara. In statistic of tourism year 2015, the process of stars hotel productivity in Special Region of Yogyakarta (DIY) is increasing every years by international tourist.

According to Setyanto (2012), travel or tour providers should master foreign languages. They are travel agent staff, hotel staff, travel guides, and the surrounding society that are involved in tourism. Moreover, the minimum targets that should be achieved in mastering foreign language communication are: simple daily conversation related to work field, basic grammar, vocabulary and basic expressions. As a matter of fact, those tourist subjects are mostly part of vocational high schools of tourism field. They should practically master foreign languages

According to pre-interview by researcher to the teach-ers that is in vocational high school 6 and 7 Yogyakarta, it found that the tendency of vocational high school students who has already work in the job field especially hospitality or tourism businesses still need the foreign language training. As the matter of fact, the foreign language study has been already taught in school, this inspired the researcher to reveal deeply from that problems. As the researcher recognized from previous studies, there are not provided yet a complete statistic data about vocational high school student's perception of competence in foreign language especially in hospitality, tourism and travel businesses in Yogyakarta.

The pre-survey to the students is also held in Vocational High School of 6 and 7 Yogyakarta about student's attitude in using foreign languages. There are almost 83% of the students agreed to get more training in enriching their foreign language study toward the need of twenty-first century skills. There are also 87% agreed to learn foreign language is compulsory for them as vocational high school in tourism field. They also need native speakers to help them in acquiring better foreign language communication.

The solution of the problems presented above is basically to conduct a study about the suitability competencies of communicating foreign language in vocational high school with the competencies needed in the twenty-first century skills between teachers and students. Ideally, through the perception of competencies of communicative foreign language that relevant to the competencies needed in twenty-first century skills of teachers and students, it will be expected to give the similar result to the need in industrial and work practices. Finally, the result of this research is expected to give the general information to education in Indonesia specifically in vocation high school education, and its developer of interest in education in order to establish better vocational education, especially in developing and revise the curriculum of foreign language, hence will give the positive input in vocational high schools of Indonesia.

The teaching of foreign language in vocational high school is not using the same approach with the teaching in high school. The teachers should understand the use of foreign language in the learning process. The learning process, in accordance with Permendikbud Number 65 of 2013 (Menteri Pendidikan dan Kebudayaan Republik Indonesia, 2013) on the Standard of Primary and Secondary Education Process, is aimed entirely at developing the realm of attitudes, knowledge, and skills as a whole through scientific approach and strengthened by applying some learning models such as discovery or inquiry learning.

Quoted from (Billet, 2011), through (Sudira, 2016) he identified at least four objectives to establish TVET: (1) the preparation for working life including informing individuals about their selection of an occupation, (2) the initial preparation of individuals for working life, including developing the capacities to practise their selected occupations, (3) the ongoing development of individuals throughout their working life as the requirements for performance of work transform over time, (4) provisions of educational experiences support-

ing transitions form one occupation to another as individuals either elect or are forced to change occupations across their working lives.

There is also a special approach teaching and learning process to treat in vocational high school. They are andragogy to heutagogy approach for vocational education. The concept of Andragogy for vocational education was originally developed by Malcolm S. Knowles that an andragogy approach is recommended as a way of enabling more meaningful outcomes for individuals (Knowles, 1980). In this approach, learners freely choose their learning goals and make independent decisions about what, how and when they want to learn. However, to gain maximum benefit from the approach, learners also need to be self-directed, autonomous and responsible for decision-making. They need to use their experiences as a learning resource (Knowles & Crawford, 1990). Typically, learners with an andragogy orientation expect the teacher to provide an environment that enhances learning and to have limited control over the process of learning. (Knowles & Crawford, 1990) mentioned that andragogy types categorized as these: (1) their self-concept moves from one of being a dependent personality toward being self-directed human being, (2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning, (3) their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles, and (4) Their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centeredness to one of performance centeredness.

According to Lee, Wahidiat, & Khurniawan, (2017) the opportunity for students to get foreign language in vocational high school is limited to 2-3 hours per week or around 80 hours in a year, which is reduced by final examination and holidays.

Meanwhile, the Directorate of Vocational High School Management (2017) (Direktorat Pembinaan Sekolah Menengah Kejuruan, 2017) has decided the TOEIC (Test of English for International Communication) as the standard of English competence for vocational high school's students. It is targeted for vocational high school students to accomplish a minimum score of 405 in TOEIC (Intermediate Level).

The term Communicative Competence was introduced by Hymes (1964) criticized the term of competence that Chomsky (1965) proposed was too narrow. According to Hymes (1964) the creativity determined by Chomsky's rule in the development of grammar of children aged 3 or 4 years does not adequately explain the social and functional rules of language. Therefore, Hymes (1964) calls communicative competence as an aspect of competence that allows us to convey and interpret interpersonal messages in a particular context. Savignon (1983, p. 9) says that communicative competence depends on the cooperation of all participants involved.

At first Canale (1988) identified three distinctive components of communicative competence: grammatical competence, sociolinguistic competence and strategic competence. Grammatical competence includes one's knowledge of lexical items, morphology, syntax, semantics, and phonology in a language. Sociolinguistic competence encompasses the knowledge of rules governing the production and interpretation of language in different sociolinguistic contexts. Lastly, strategic competence is defined as one's capability to sustain communication using various verbal or non-verbal strategies when communication breakdowns occur. This model was updated again by Canale by proposing a four-dimensional model of communicative competence: grammatical, sociolinguistic, discourse, and strategic competence.

The twenty-first century marked the century of openness or the age of globalization, meaning life human beings in the twenty-first century undergo fundamental changes that are different from the order of life in the previous century. It is said the twenty-first century is the century that ask for quality in all efforts and work of man. By itself the twenty-first century asks for resources quality human beings, produced by professionally managed institutions resulting in superior results. The all-new demands call for variety breakthroughs in thinking, drafting, and actions.

According to Trilling & Fadel (2009), they focus into critical learning skills and innovation. In the explanation of critical thinking and problem solving skills student should be able to (1) reason effectively, (2) use systems thinking, (3) make judgement and decisions, and (4) Solve problems. Meanwhile, commu-

nication and collaboration skills, student should be able to and communicate clearly and collaborate with others. For the next aspect is creativity and innovation skills which also carry some factors for student to do, such as (1) think creatively, (2) work creatively with others, and (3) implement innovations.

Table 1. Communicative Competence by Canale and Swain

No	Communicative Competencies
1	Grammatical Competence It refers to the extent that mastery of the language code has occurred, including vocabulary knowledge, word formation, syntax, pronunciation, spelling and linguistics semantics. A person demonstrates grammatical competence by using a rule not by stating a rule.
2	Sociolinguistic Competence It requires an understanding of the social and cultural context in which language is used which involves: (1) the role of the participants; (2) the information they share; (3) the function of interaction
3	Discourse Competence It is concerned with the interpretation of isolated sentences but the connection of a series of sentences or utterances to from a meaningful whole such as: (1) Speaking (dialogues, conversation and monologues); (2) Writing (memos, letters, ads). It also refers to the mastery of "how to combine grammatical forms and meanings to achieve a unified spoken or written text".
4	Strategic Competence It refers to the mastery of verbal and non-verbal communication strategies we employ during the breakdown in communication or when we lack any of the competencies to communicate effectively, also used to enhance the effectiveness of communication

In conclusion, there are three main skills in twenty first century such as learning and innovation skills, digital literacies and life career skills. Those three skills have specific components as branches to set up the framework of capability that needed in twenty-first century skills.

According to Slameto (2010) perception is a process that involves the entry of messages or information into the human brain. Through perception, human constantly connect with their environment. This relationship is done through the senses, namely the sense of sight, hear, touch, taste and smell.

Table 2. The twenty-first century by Trilling and Fadel

No	Twenty-First Century Skills
1	Learning and Innovation Skills - Critical thinking and problem solving (expert thinking) - Communication and collaboration (complex communication) - Creativity and innovation (applied imagination and invention)
2	Information, media, and technology skills - Information literacy - Media literacy - Information and communication technology (ICT) literacy
3	Life and career skills - Flexibility and adaptability - Initiative and self-direction - Social and cross-cultural interaction - Productivity and accountability - Leadership and responsibility

Devidoff (1987) stated about perception is a cognitive process are inter-connected. Devidoff begub the survey of cognition with perception because perception is the point where cognition and reality meet and perhaps the most basic cognitive activity out of which all other emerge. Perception is the meaning of input or responses received by someone whose meaning is influenced by knowledge and experience (Alpian & Suryaman, 2016). To get the positive results from the perception that is actually owned by the student himself then knowledge and experience built at the stage of recognition and object learning or related material must be positive too.

In relation to perception of students and teachers to communicative competence and twenty first century skills is the recognition of subject learning that they get or convey toward the use of foreign language in classroom based on the experience they built in their daily activities teaching and learning of school, whether it is a perception of positive, match or mismatch, or disagreement.

RESEARCH METHOD

This present research is conducted through quantitative method and explanatively with survey approach. The purpose of this method is to describe systematically a situation or area of interest, factually and accurately (Isaac & Michael, 1981). Explorative means to answer all the questions that has been formulated in that research questions. Some of the data using hypotheses which means it use the hypothesis as the instruction/ guide in the research on certain research questions, then the research sequentially describe clearly towards the research questions that has been identified long before the researcher work on the survey.

The data collection was done by using a questionnaire containing variable items used in the study. The steps followed include: (1) identifying problems; (2) clearly delineating and defining the problem; (3) defining research objectives and benefits; (4) conducting literature study; (5) determining the research mind set and question; (6) constructing the research design that includes population, sample, sampling technique, instrument; (7) collecting data; (8) organizing and analyzing data; and (9) writing the research report.

The population of this research is selected from state vocational high schools in Yogyakarta, with the following criteria: (1) holding tourism, tourism business, and hospitality programs; (2) applying Curriculum 2013; (2) adopting foreign language test (TOEIC, iBT or other optional foreign language tests); (3) owning partnership with hotel or travel companies in Yogyakarta; (4) having foreign language teachers; (5) the population is 523 vocational high students majoring in tourist travel businesses, hospitality, and tourism programs at SMKN's in Yogyakarta.

Table 3. List of vocational high school as the subject of research

No	Vocational School	Address	Students	
			P	S
1	SMKN 4 Yogyakarta	Jl. Sidikan 60. Yogyakarta	182	50
2	SMKN 6 Yogyakarta	Jl. Kenari No. 4, Yogyakarta	180	50
3	SMKN 7 Yogyakarta	Jl. GowonganKidul JT III/416	160	40
Jumlah			532	140

The number of samples in this study as many as 140 students determined according to the table of Krecjie Morgan and established using the proportional random sampling technique. The three vocational high school samples are vocational high school 4 Yogyakarta, vocational high school 6 Yogyakarta, and vocational high school 7 Yogyakarta.

Besides the students as research subjects, this study also took the sample of 16 teachers of SMKN 4, 6 and 7 Yogyakarta who are practically teachers of foreign languages in the three schools. Because the teacher population was less than 100 people, the sample was then taken from the entire population which was the saturation sampling.

The significant (2-tailed) level used in this research was 5%. According to Sugiyono (2013) the minimum requirement that fulfills validity is r> 0. 30. Therefore, the correlation between Items and total score need to be less than 0. 30 (<30), or else it will be stated as invalid. Supranata (2005, p. 59) states that the manual analysis of data is formulated as follow:

$$r = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

Description:
r : Correlation Coefficient
Σxy : multiply of x and y
Σx : total score x
Σy : total score y
Σx2 : total score of squared x
Σy2 : total score of squared y
N : total score sample

Testing the validity of the contents of the instrument was also done by comparing the suitability between indicators and instrument grids with the instrument already made by an experienced expert. It aimed to make each Item of the instrument appropriate to answer the data to be sought.

The score result of reliability instrument for communicative that amounted to 25 statements is 0,839. Then for twenty-first century competence that amounted to 41 statements is 0,845. Thus, from those instrument reliability test, we can conclude that both of instruments are reliable.

Requirement of pre data analysis is using normality test and homogeneity test. This is stand out as pre requirement to use One-Way ANOVA test and Mann Whitney test because both are non-parametric statistic (Bluman, 2012).

Table 4. Table of Specification for Communicative Competencies

Variable	Indicator	Predictor	Item No (+)	(-)
Communicative Competence	Grammatical Competence	Phonological, Lexical, and Structural	1, 2, 3, 4, 5, 6, 7, 8, 9	
	Sociolinguistic Competence	Understanding and producing utterances	10. 11, 12, 13, 14, 15	
	Discourse Competence	Combining grammatical forms and meanings to write text in different genres	16, 17, 18, 19, 20. 21	
	Strategic Competence	Using relevant language contents such as language functions	22, 23, 24, 25, 26	
TOTAL			26	0

Table 5. Table of Specification for the Twenty First Century Competencies

Variable	Indicator	Sub Indicator	Predictor	Item No (+)	(-)
Twenty-first Century Competence	Learning & Innovation	Critical Thinking & Problem Solving Skills	(1) Reason effectively (2) Use system thinking (3) Make judgements and decisions (4) Solve problems	1, 4, 5, 6, 7	2, 3
		Communication and Collaboration	(1) Communicate clearly (2) Collaborate with others	8, 9, 11,12, 13,14, 15	10
		Creativity and Innovation	(1) Think creatively (2) Work creatively with others (3) Implement innovations	16,17, 18	
	Digital Literacy	Information Literacy	(1) Access and evaluate information (2) Use and manage information	19, 20. 21	
		Media Literacy	(1) Analyze media (2) Create media products	22, 23	24
		ICT Literacy	Apply technology effectively	25, 26, 27	
	Career and Life	Flexibility and Adaptability	(1) Adapt to changes (2) Be flexible		28, 29, 30, 31, 32
		Initiative and Self-Direction	(1) Manage goals and time (2) Work independently (3) Be self-directed learners	33	34, 35, 36
		Social and Cross-Cultural	(1) Interact effectively with others (2) Work effectively in diverse teams	37, 38, 39	
		Productivity and Accountability	(1) Manage projects (2) Produce results	40. 41, 42,43, 44,45, 46	
		Leadership and Responsibility	(1) Guide and lead others (2) Be responsible to others	47, 48, 49	
TOTAL				37	12

RESEARCH RESULTS AND DISCUSSION

The research is conducted in 3 state vocational high schools of Yogyakarta that holds hospitality and tourism businesses program. There are vocational high school 4 Yogyakarta, vocational high school 6 Yogyakarta, and vocational high school 7 Yogyakarta. The three schools have been identified and categorized applying curriculum 2013; held the hospitality and Tourism businesses; adept the foreign language test such as TOEIC, iBT, TOPIK, HSK and other optional foreign language test; and has their own Edotel (Education Hotel), Technopark and partnership to Association of the Indonesian Tours and Travel Agencies (ASITA). The three schools recog-

nized as high ranked state school in vocational high schools that has tourism program in Yogyakarta and has their own specialities to maintain their schools best reputation.

The data that has been collected through quantitative way is covered to total of 137 respondents from teachers and students. The teachers are amounted to 12 person with all different background teaching such as English, Japanese, Mandarin, French, German, and English language. The students are amounted to 125 person with various program studies such as hospitality, tourism businesses, culinary art, and fashion. The respondent from vocational high school 4 are mostly from tourism businesses program study with colourful languages taught in class such as English, Japanese, and Mandarin language. Meanwhile, from vocational high school 6 is more mixed-up respondents such as tourism travel businesses, culinary art, fashion and hospitality program, they also have varieties of languages that are taught such as English, German, and France language. Therefore, in vocational high school 7 is only have single language to teach in classroom, it is mainly English and only hold tourism business as the program study.

The findings of the quantitative data from communicative competence provide valuable insight into the information of students. These findings can offer a framework for a better understanding of learner needs as well as for the need of innovation in teaching methodology to vocational high school students so as to enhance learners' communicative competence. The following is a summary of the keywords in the first description of communicative competence:

1. Grammatically students are seems shy to use foreign language outside from classroom. In phonological side, they need to have self-confidence and practice more even though it is not grammatically correct, it is an urge for them to apply the foreign language conversation outside the classroom. Thus, they have confidence in constructing an analysis through the words.
2. Regarding motivation, the students were very interested in learning target cultures and called for innovative teaching methods for target culture courses.
3. Students are tend to work on memorizing new vocabularies, which in this case, is using a whole cognitive application rather than to practice it out. To encounter that, mostly students use that capacity of memorizing to convert it as their style or strategy in learning foreign language and not to communicate it instead.
4. School that only has one subject in learning foreign language given a genuine attitudes toward producing their communicative competence, meanwhile other schools that has multiple foreign language learning given mixed data from students.
5. Students seemingly like to hear the teacher explanation word by words. This is one example of traditional way of teaching that capitalizing to teachers-centeredness and causing to students' passive learning.

The students focused mainly on receptive skills rather than productive skills. This points to, in part, their deficiency in their communicative competence.

Meanwhile in twenty first century competence, there are several interim summaries that can be concluded in this competences as follows:

1. Students' dependency to teachers are highly happened regarding in assessing their capability in learning. In contrast to that, they have their own method or style in solving their own problems in learning foreign language.
2. One school that has only one subject of foreign learning in classroom has anxiety to pronounce the communication of the target language.
3. Students has confidence to face the challenge of reality in work in using foreign language by creatively to use their knowledge foreign language and transfer it to their field of work or internal practice.
4. Students rely themselves a lot in using technology of ICT, to access online translation and checking some information. However, their capability in debunk the hoax or untrusted news information still lack and needs more coordination from the teachers.
5. Students seems visionary about their future, and seeing the foreign language learning can help their future job.
6. Regarding of self-directing, the students has the foremost strategy to encounter that with their own style in classroom, yet their initiative toward using it outside the classroom seems still in a low chance.

7. Most of students like the idea of after-school clubs or extracurricular foreign language to increase their capacity of social and cross cultural learning.
8. The students have some capacities in increasing their productivity and accountability to learn foreign language.
9. Positive attitude towards leadership and responsibility are also found the result of the research from the students.

Overall from the result of the research that quantitavely has been collected through the students questionnaire which consisted of two themes with sub competences, the analysis of students data shows that most students has their own style in learning foreign language. On the communicative competencies which has 25 items, the results showed that the students have most capabilities in memorizing some new words with their own style and strategy. However, they are lack in self-esteem to try it out from the classroom. There was also found that the schools still teaching the students in a traditional way which is really contrast to the curriculum 2013 or communicative purposes. Meanwhile, in twenty-first century competence that showed 40 items, the student's dependency to teachers is still highly occurred from the students.

Another fact is the perception data comparison between student and teachers. The Mann Whitney U Test results show that of these 66 Items in total, there are nine items that are statistically significant different. Those items can be seen in Appendix B-5. This comparison is intended to figure out the mismatch of concept between students and teachers.

The following figure shows the mean and comparison between students and teachers on questions of communicative competence:

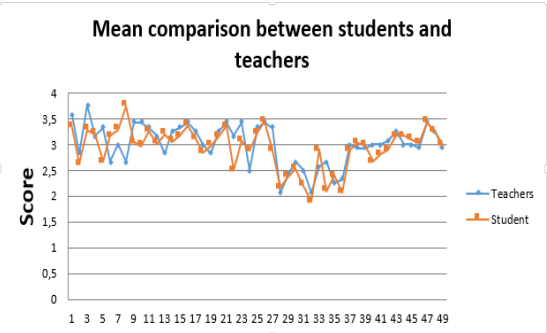

Figure 1. Communicative Competence Comparison

There are only two items identified in this finding. They are found on the grammatical com-petence as follows: Item 5 (P<0. 024) and Item 8 (P<0. 006).

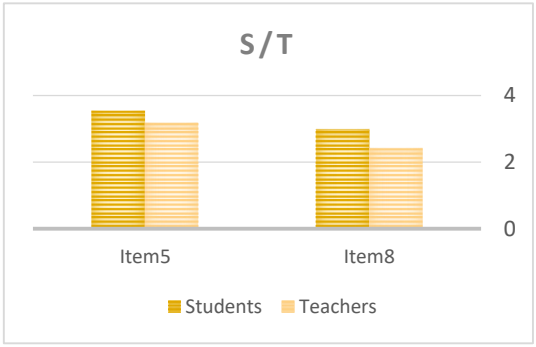

Figure 2. Items of Significant Difference on Communicative Competence

From the result of Mann Whitney u-test, the findings show that the area of disparity occurs in grammatical competence. Both of the items have this significant disparity. Item5 (see also Appendix B-4) is scored more highly by the students than by the teachers, indicating that the students show their perseverance in understanding every single word from foreign languages they hear. They have this motivation to learn more about foreign languages based on their intrinsic needs. The proof has synced to other items such as other strategic competence indicators where they would do their best to learn a foreign language. It is expected from the teachers to be aware of this positive attitude and facilitate them properly.

Besides, Item 8 also shows the same positive motivation where the students can practice themselves through self-talk in front of the mirror. In relation to these findings, it is suggested that the teacher be more active to encourage the positive energy of their students and to involve them into commitment to better learning foreign languages.

In relating to the comparison data from students and teachers, the teachers are expected to be aware to what students' needs. Even though students are capable in high thinking order, the teachers is suggested to be aware toward students' positive attitude and facilitate them rightfully and the teachers should avoid the traditional ways of teaching. Regarding to vocational high school students need that has to be related with twenty-first century competences, both students and teachers like the idea of grouping in learning foreign language. This

competence is the core of learning to collaborate with others for their future job will much require to involve and engage in teamwork.

Meanwhile, below is the result of the twenty-first century competences perception.

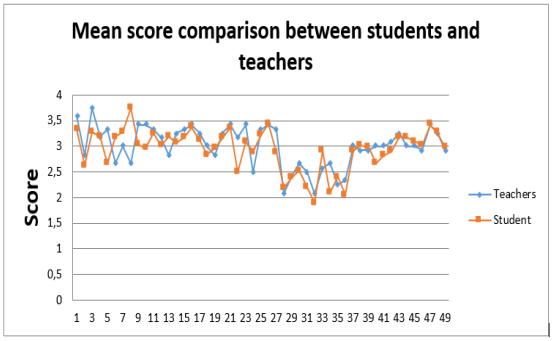

Figure 3. Twenty-First Century Comparison

There are seven items resulted from Mann Whitney u-test on teachers' and students' answers.

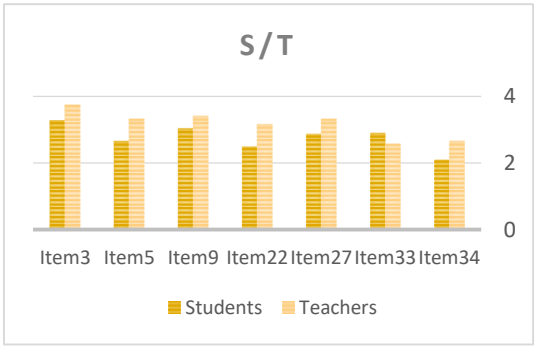

Figure 4. Significant Different Items on Twenty-First Century Competence

Learning and Innovation

Critical thinking and problem solving: Item 3 (P < 0.002) and Item5 (P < 0.003)

Surprisingly, on Item3, the teachers' perspective scores are higher than the students'. This indicates that teachers still depend on traditional ways of teaching. In the twenty-first century competence, students have to increase their own critical thinking and they can identify the extent of their knowledge foreign languages. On the other hand, they are already aware and capable of high thinking so that they can measure their own capacities aside from teachers' scores.

On Item 5, the teachers and students agree that the authority in foreign language learning classes is in the teacher's hand. The students respect the teachers and can critically think when they have to ask their teachers questions. Typically, in the twenty-first century competence this will impact on their future jobs to respect their supervisors later at work, but not losing their competence in critical thinking not to let down their leaders in company or any acquaintances they work with.

Communication and collaboration: Item 9 (P<0.028)

Both of the teachers and students like the idea of grouping in learning foreign languages, which shows a positive attitude toward the twenty-first century competence. This competence is the core of learning to collaborate with others for they require to involve and engage in teamwork for their future job.

Digital Literacy

Media literacy: Item 22 (P < 0.001)

From the teachers' perspective, this has a slight difference; the teachers' score is higher than students'. The teachers believe that the students are more capable of making a summary from a film they watch together in the classroom verbally or written in foreign language. On the contrary, the students relatively do just well on that respected competence, but they still feel a little bit anxious in using a foreign language from the media they are use.

According to the research of Surjono & Susila (2013), it is suggested by the researchers to use media in learning English as foreign language because it is boosted the learning achievement until 70% rather than using conventional method.

ICT literacy: Item 27 (P < 0.010)

This item also shows a slight divergence between the two groups. Even though they have the same idea about the ability to identify hoaxes when accessing information, it seems that the idea of ICT literacy in schools that use foreign language materials is rarely found in teaching and learning stuff. However, this needs to be explored more by the authorities in education that debunk hoaxes in the part of ICT literacy, and they need to be presented in schools for their part of critical thinking as well.

Career in life

Initiative and self-direction: Item 33 (P < 0.042) and Item 34 (P<0.003)

On Item 33, students are feeling more active to use their foreign language when communicating with their peers and teachers. In this case, the teachers also give the same positive answers. Although some of the teachers may not have time to observe every single student, the students still clearly show their confidence when they learn in peer groups.

Regarding Item 34, the teachers have low trust on their students in practicing foreign language outside the classroom. This finding shows the importance of outside classroom observation where students need to improve their initiative to use foreign languages. Related to the twenty-first century, this skill is strongly linked with working independently where students have to monitor, define, prioritize and complete tasks without direct oversight and also to be self-directed learners. It is expected that the teachers understand this competence so there will be no more 'teacher-centered' teaching and learning which is far more like a traditional way.

Overall, from the result of the analysis of the data that quantitatively have been collected through the students' questionnaire which consists of two themes with sub competencies, the analysis of students data shows that most students have their own style in learning a foreign language. In the communicative competency questionnaire which contains 25 items, the results show that the students have most of the ability to memorize some new words in their own style and strategy. However, they lack self-esteem to try it out in the classroom. It is also found that the schools still teach the students in a traditional way which is really in contrast with Curriculum 2013 or communicative purposes. Meanwhile, in the twenty-first century competence questionnaire which contains 40 items, the student's dependency on their teachers still occurs in a high frequency. It is found by Sartika, Puspita, & Imranuddin, (2018) that the syllabus based on the communicative approach would help the students use the language as a means of communication in every aspect of working condition in the classroom or hotel.

In relation to the comparison of the data from students and teachers, the teachers are expected to be aware of what their students need. Even though the students have higher order thinking skills, it is suggested that the teachers be aware of their students' positive attitude, facilitate them rightfully, and avoid the traditional ways of teaching. With regard to vocational high school students' needs that should be related to the twenty-first century competencies, both students and teachers like the idea of grouping in learning foreign language. This competence is the core of learning to collaborate with others and will be much required to involve and engage in teamwork for their future job.

CONCLUSSION

According to the result of the research and discussion, it can be conclude as follows.

First, student competencies of communicating foreign language that taught in vocational high school are following communicative competencies that divided into 4 sub-competencies. They are grammatical, sociolinguistic, discourse, and strategic competence. The students are categorized problematic with using it out from the classroom and peers.

Second, students competencies of communicating foreign language based need on twenty-first century skills that taught in vocational high school are following twenty-first century competence that divided into 3 sub-competencies. They are learning and innovation, digital literacy, career and life competencies. The students are categorized good enough to utilize information and technology, solving their own problem and using creativity toward it, and working in collaboration with others.

Third, there are seven items that showing student's significant differences by the One-Way ANOVA Test across three schools for communicative competences. Besides, there are eighteen items that showing students' significant differences for twenty-first century competence.

Fourth, there are two items that identified as significant difference by the Mann-Whitney U Test between students and teachers across three schools for communicative competence. Therefore, there are seven items that identified as significant difference for twenty-first century competence.

According to the result and discussion, the suggestion for this research is explained as follows:

Fisrt, to the foreign language teachers, this research is expected to be the input to for teaching and learning foreign language, either in classroom or out from the classroom as the vocational students or vocational high school needed.

Second, there needs to be a quality and match andragogy teaching to the foreign language learning for vocational high school students rather than focus on pedagogy.

Third, it is expected from the curriculum holder to create a forum to the entire of foreign language teachers and regularly evaluate the vocational high school needs based on twenty-first teaching and learning on the curricula.

Fourth, it is suggested to do future observation toward discrepancy and mismatch perception between students and teachers.

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DEVELOPING A MODEL OF PARTNERSHIP MANAGEMENT BETWEEN THE VOCATIONAL HIGH SCHOOL AND THE EMPLOYMENT DOMAIN IN THE CURRICULUM OF INDUSTRIAL WORKING PRACTICE

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Abstract

The study was to develop a model of partnership management between the vocational high school (VHS) and the employment domain in the curriculum of industrial working practice under the activities of planning, implementation, monitoring, and evaluation in the vocational high schools of Banda Aceh. The study used the research and development method design with several phases that had been developed by Borg & Gall. The data type in the study was qualitative and quantitative. For the qualitative data analysis, the researcher used the interactive analysis that had been developed by Milles & Huberman. On the other hand, for the quantitative data analysis the researcher used a Likert-scale measure. The research subjects were vocational education practitioners and experts. The data gathering was conducted by means of documentation, observation, interview, and delphi techniques; all of the methods were implemented until the researcher found the conceptual model. Then, the researcher involved the experts in the model testing by using the Delphi technique resulting in a hypothetical model from the conceptual to be used as the basis for developing the final model. Eventually, the researcher drew the following conclusion: (1) The partnership between the VHS and the employment domain had been pursued by all of the vocational high schools in the City of Banda Aceh but there had not been any clear and integrated model of partnership management; and (2) the researcher generated a model development of partnership management between the VHS and the employment domain in the curriculum of industrial working practice clearly, practically, and effectively.

Keywords: *partnership management, employment domain, vocational education*

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INTRODUCTION

The present study is to develop a model of management partnership between the VHS and the employment domain under the activities of planning, implementation and evaluation toward the curriculum of working industrial practice. The research problems in the study are as follows: (1) which type of partnership management model is able to be implemented in the state vocational high schools of Banda Aceh City under the curriculum of industrial working practice and what are the constraints within the implementation?; (2) how is the model of partnership management between the VHS and the employment domain in the three state vocational high schools of Banda Aceh City?; and (3) what are the characteristics and the effectiveness of partnership management model between the VHS and the employment domain in the curriculum of industrial working practice? Then, the results of the study might be made as guidelines in establishing the partnership between the VHS and the employment domain and this will be the benefit of the study for the institutions, the researcher, and the domain. The specifications of the model are as follows: (1) possessing the types and the principles of partnership management; (2) possessing collaboration in the partnership phases theoretically (Epstein et al., 2009, p. 105), empirically (Suaidin, 2010), and formally (Direktorat Pembinaan Kursus dan Kelembagaan, 2010).

Linda & Christopher (2007, p. 8) stated that although the students of the vocational high schools get the benefits of closed relationship between the industrial domains and the academicians, the university students and the curriculum development, the strategy for pursuing the industrial involvement in addition to the multiple educational institutions frequently is messy and lacks focus, commitment, and resources. The existing approach is still traditional and is frequently ruthless toward the industrial domains; as a result, it has not been sufficient anymore for the contemporary educational institutions to pursue the importance of society involvement and of curriculum relevance. This awareness encourages the necessity of pioneering a new strategic approach that has initiative toward the involvement of industrial domains based on the partnership approach.

The implementation of industrial working practice for the vocational high school students in the employment domain has been one of the partnership form which implementation still encounters many constraints. One of the constraints is the existence of different industrial working practice facilities; as a result, the industrial working practice becomes ineffective.

The philosophy of vocational education management refers to two of the 16 vocational education postulates that have been developed by Prosser & Quigley (1950) namely: (1) the vocational education will be effective if the students are taught with similar materials, tools, machineries, and assignments because the students will work effectively and efficiently if they are provided with the learning environment that looks similar to their actual working environment such as the replica of the actual working environment where they will be working; and (2) the vocational experience will be effective if the assignments in the exercises have operational similarities to the tools and the machineries that they will use in their actual working environment.

In the Curriculum and Learning Affairs under the Government Regulation Number 19 Year 2005 Chapter 1 Article 1 Verse 13 (Presiden Republik Indonesia, 2005), it is mentioned that "Curriculum is a set of plan and arrangement toward the objectives, the contents and the materials that will be used as the guidelines of implementation in achieving certain educational objectives." Curriculum and learning have been important matters in the school because a curriculum serves as the guidelines for implementing the learning process as having been explained by (Arikunto & Yuliana (2008, p. 131): "Learning curriculum refers to managerial activities that have been conducted together by emphasizing the efforts of improving the teaching-learning interaction". The objective of the curriculum and learning is to improve the curriculum and learning quality and, in order to achieve the objective, the schools should design and improve the strategies of curriculum and learning development continuously. Sukmadinata (2005, p. 6) mentions, "curriculum and learning are designed in order to achieve the educational objectives that provides clear educational guidelines, directions, content, and process." Similarly, the Department of National Education (Pusat Kuriku-

lum Badan Penelitian dan Pengembangan, 2007, p. 10) states, "The vocational high schools have speciality in the productive subjects." Similar to the other subjects, the content standards and the competence standards of the graduates for the productive subjects should be reviewed. The review activities might be performed by involving the teachers and the lecturers who have industrial experience and the professionals in terms of the related association. (Choate, Enright, Miller, Poteet, & Rakes (1992, p. 2) mentions that the curriculum and learning that will be developed might refer to several governing curricula and learning forms and one of these forms is the competency-based curriculum in which all of the curriculum and learning activities are directed to the functions and the capabilities that have been demanded by the employment market or the employment domain.

RESEARCH METHOD

The study used the Research and Development (R&D) method. Previously, the study of research and development was to find a model of partnership between the VHSs and the employment domain in the curriculum of industrial working practice. However, during the initial survey the researcher found that the management of partnership between the VHSs and the employment domain had been running well but there had not been a good and overall model of partnership. Therefore, the objective of the study is to develop a model of management toward the partnership between the VHS and the employment domain in the curriculum of industrial working practice.

The research and development model design refers to the guidelines of 10 steps in performing an R & D study proposed by Borg & Gall (1983, p. 775) as follows: "(1) research and information collecting, (2) planning, (3) developing preliminary form of product, (4) preliminary field testing, (5) main product revision, (6) main field testing, (7) operational product revision, (8) operational field testing, (9) final product revision, and (10) dissemination and implementation."

The developmental procedure of the management model follows the steps proposed by Borg & Gall above. Although the researcher did not fully attend the overall 10 steps, the model development was still possible to be conducted. The study was conducted in 2012 (the initial survey) until 2014 (the model testing) to several vocational high schools in the City of Banda Aceh, the Province of Nanggroe Aceh Darussalam. The subjects of the research consisted of experts and technological and vocational education practitioners. Data gathering techniques consisted of initial survey, documentation study, interview, and Delphi technique. There were two kinds of research data namely: (1) qualitative data; and (2) quantitative data. For the qualitative data analysis, the researcher used the interactive analysis proposed by (Miles & Huberman, 1994, pp. 23–25) with the following steps: (1) data gathering; (2) data reducing and presenting; and (3) conclusion drawing. Meanwhile, for the quantitative analysis the researcher used the Likert-scale analysis toward the data resulting from the field product testing questionnaire. The field product testing questionnaire contained several questions/statements for gathering the data. The quantitative data were gathered in order to measure the level of product feasibility that had been attained from the product users. The data then were analyzed by means of Likert scale in order to find the lowest score, the highest score, and the average score.

RESEARCH RESULTS AND DISCUSSION

The management of partnership in the curriculum and learning affairs and in the activities of planning, the implementing and the evaluating for the curriculum and learning affairs showed that: (1) within the domain of organizational structure the employment domain had not been included in the curriculum domain; however the employment domain had been included in the organizational structure of the vocational high schools; and (2) from all of the tasks and the authority that had been under the domain of curriculum department, there had not been any single task showing written agreement with the employment domain although verbally the school members had admitted the involvement of the employment domain in designing the curriculum affairs; (3) it was admitted that the curriculum that had been developed in the schools was totally different from that of the working system in the employment domain; (4) in the curriculum structure, the internship programs had not been included and there were industrial working

practice programs; and (5) the activities in the curriculum department in general were still internal within the schools and there had not been any special curriculum that had been designed for developing the curriculum and learning in the detailed implementation of the working industrial practice.

The Initial Product Development Planning.

After analyzing the results of the study in the three state vocational high schools of Banda Aceh City, namely Negeri 1 State Vocational High School, Negeri 2 State Vocational High School and Negeri 3 State Vocational High School, the researcher found similar situations that had been explained in the previous paragraphs regarding the topic of management model for the partnership between the vocational high schools and the employment domain, the constraints that the vocational high schools encounter in their partnership with the employment domain, and the evaluation toward the curriculum affairs.

The discussion was conducted with the vocational education experts, the vocational education practitioners, several students of Postgraduate Programs, Technology and Vocation Study Program, Yogyakarta State University and the sponsor. After the discussion, the researcher found a conceptual management model toward the partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice. The conceptual model was viewed from three managerial functions in terms of curriculum and learning process namely: (1) plan-ning; (2) implementing; and (3) evaluating. The results of the discussion were turned into a conceptual chart that was called the conceptual management model of partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice. From the research and development efforts in the systematic, complicated, and time-consuming curriculum of industrial working practice, the researcher found multiple research instruments that might be used for developing the partnership management.

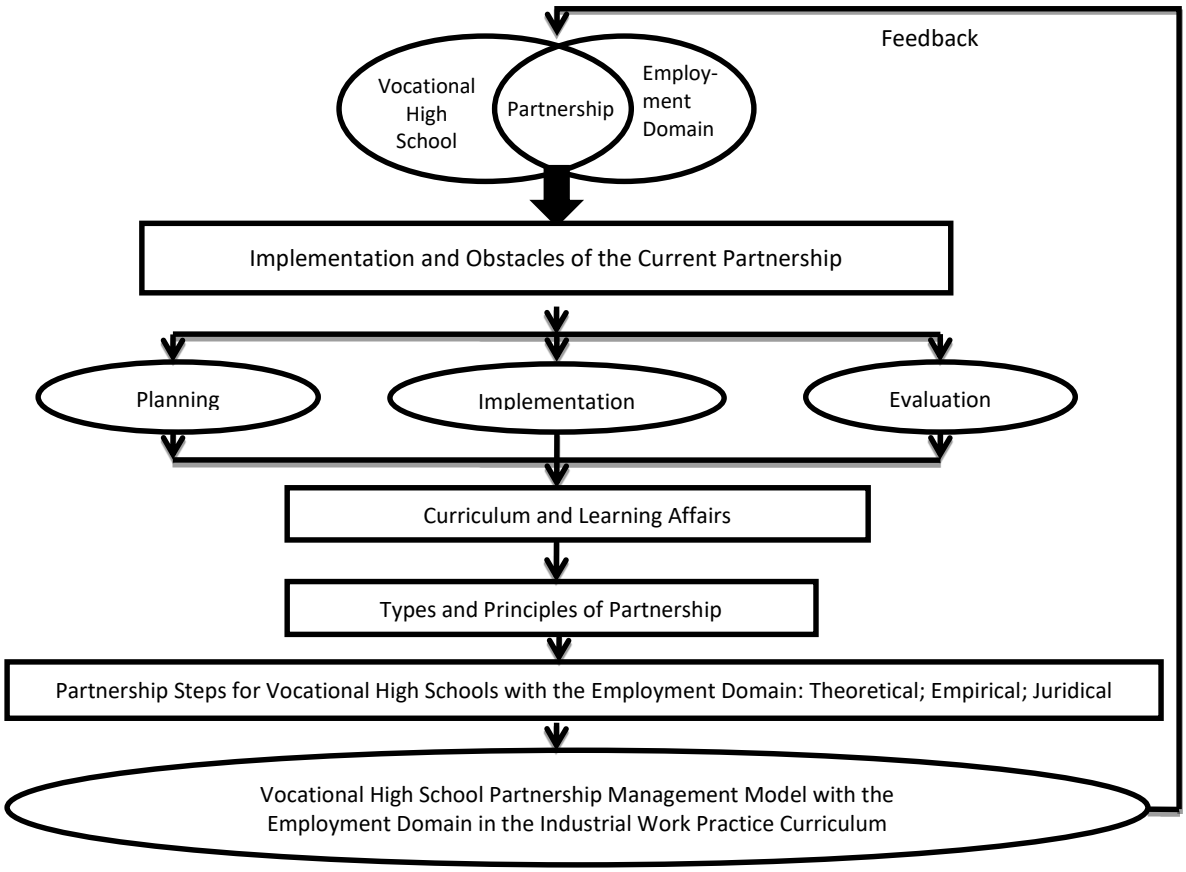

Figure 1. The Conceptual Management Model for the Partnership between the Vocational High Schools and the Employment Domain

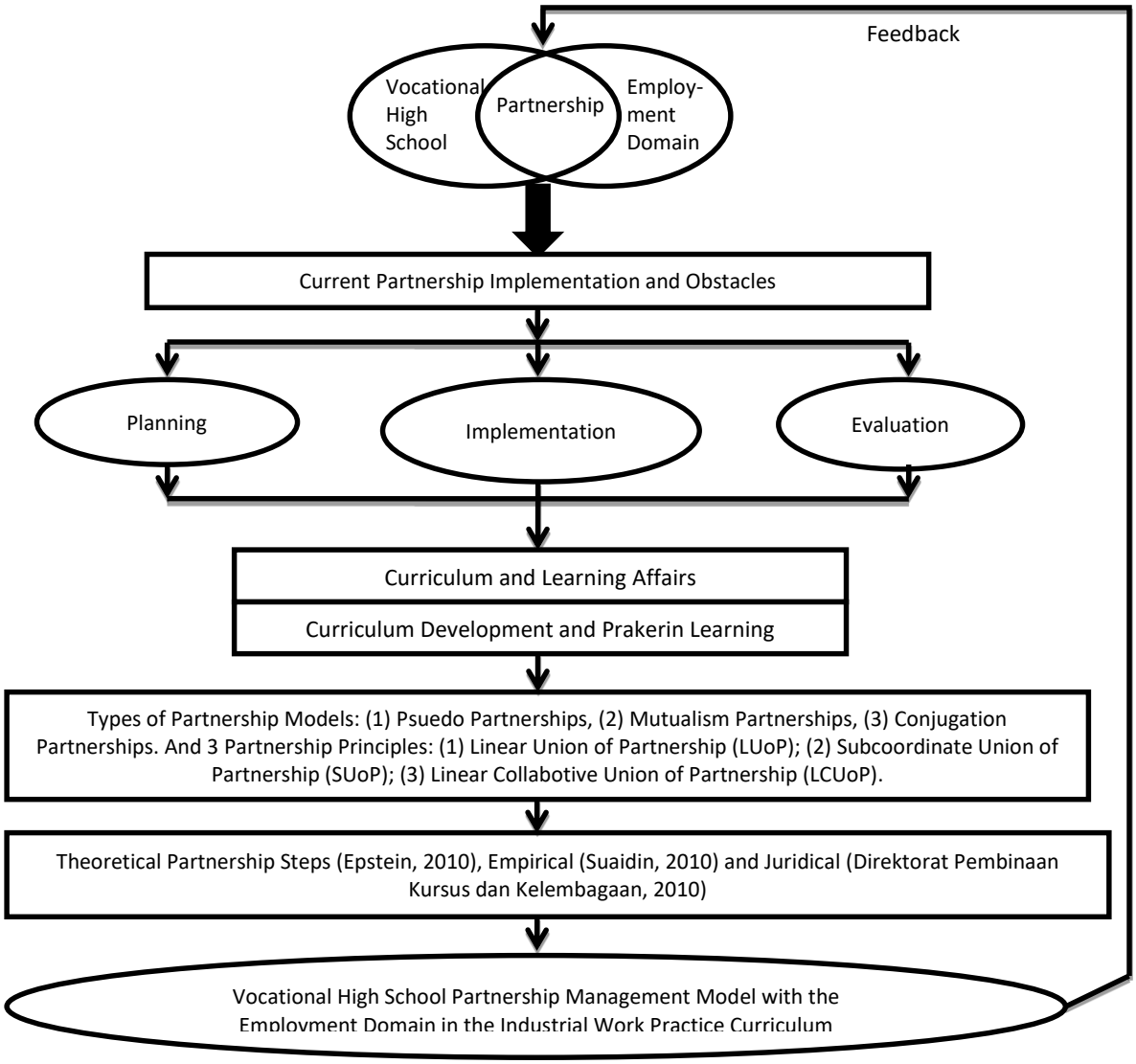

Figure 2. The Hypothetical Management Model for the Partnership between the Vocational High Schools and the Employment Domain

The conceptual framework of the partnership management model had been a summary of research instruments that contained the questions toward the description of components and indicators for the management model development in the curriculum and learning affairs. Based on the results of the continual consultation/discussion with the sponsor and the co-sponsor, the researcher designed an initial product that was called as the hypothetic management model for the partnership. The conceptual management model can be seen in Figure 1.

Based on the results of continual consultation/discussion with the sponsor, the researcher designed an initial product called the hypothetical partnership management model. This hypothetical model can be seen in Figure 2.

The hypothetical model testing was limited to the vocational education practitioners. The results of the hypothetical model testing were reviewed. The results of the revision were tested by the vocational education experts by means of the Delphi technique with two rounds. The first round of of Delphi technique consisted of three managerial components namely: (1) planning; (2) implementing; and (3) evaluating. The three components in the model were equipped with development indicators for the curriculum of industrial working practice. The results of the experts' testing can be seen in Figure 3.

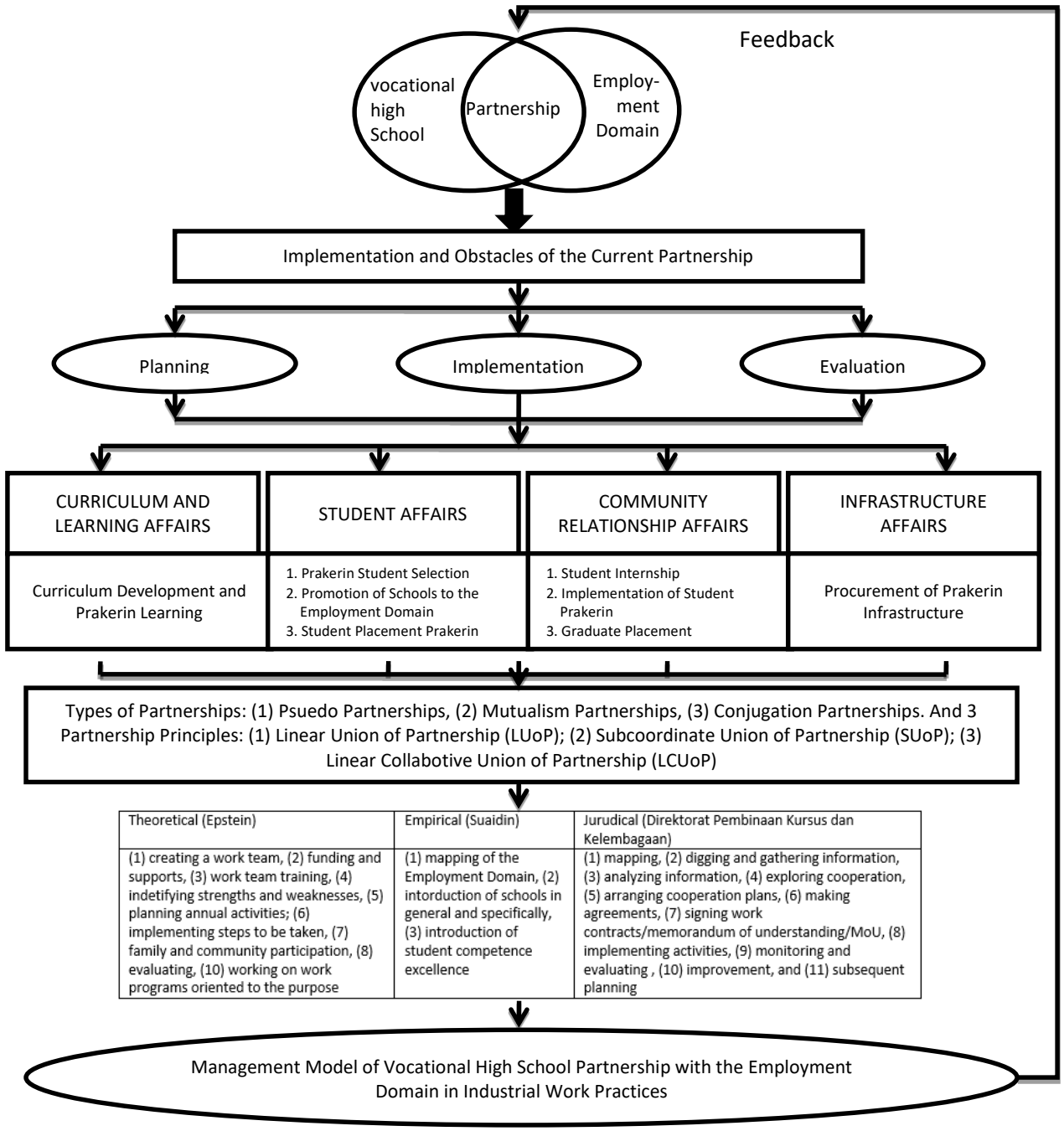

Figure 3. The Management Model of Partnership Between the Vocational High Schools and the Employment Domain Resulting from the First Round of Delphi Techniques Implementation

The results of experts' testing of the first round of the Delphi techniques were not satisfying because there were several experts whose scores were not synchronized. The Delphi was then conducted in the second round. The results of the testing in the second round, together with the feedbacks from the expert judgement, showed that the three managerial components, namely planning, implementing, and evaluating, in the proposed case, namely the curriculum and learning affairs, should be maintained. Then, the three indicators for the curriculum of the industrial working practice were: (1) developing the industrial working practice curriculum and learning; (2) synchronizing the industrial working practice curriculum and the employment domain; and (3) involving directly the employment domain in developing the

industrial working practice curriculum. The experts also suggested that the researcher should add two more indicators of: (1) performing supervision; and (2) performing control. The end result was that there was a total of six indicators for the development.

The partnership type that the experts proposed was the mutualistic partnership because this type had been considered more appropriate to the expected conditions of vocational high schools recently. For the partnership principle, the experts suggested the linier collaborative union of partnership (LCUoP) that was thought to be more appropriate for the managerial function of the industrial working practice in the employment domain. Regarding the partnership phases that had been proposed theoretically, empirically and formally, all of the experts stated that all of the phases should be collaborated by using the phases that had been considered important in establishing a partnership. As a result, the researcher attained the following phases of establishing a partnership: (1) assembling a working group of industrial working practice; (2) providing training programs for the working group; (3) mapping the school and the employment domain; (4) analyzing the job needs that should be put into the partnership within the industrial working practice in terms of cost, time, and location; (5) designing a memorandum of understanding (MoU); (6) establishing partnership in the industrial working practice; (7) performing monitoring and evaluation toward the partnership in the industrial working practice; and (8) composing reports of partnership establishment. The results of the expert testing by means of the Delphi techniques in the second round were analyzed and put into the model of management for the partnership between the vocational high schools and the employment domain. The partnership management is illustrated in Figure 4.

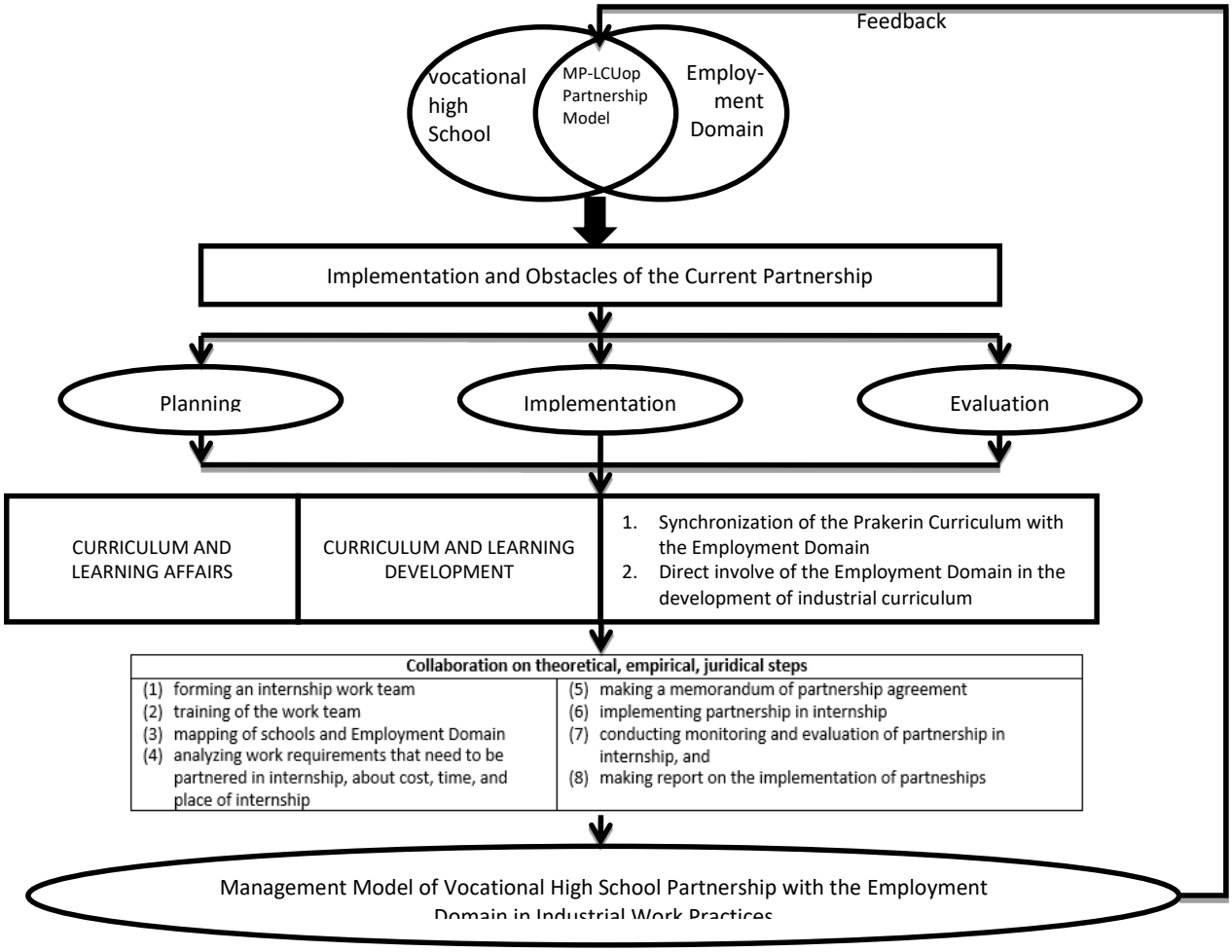

Figure 4. The Management Model of Partnership between the Vocational High School and the Employment Domain Resulting from the Second Round of Delphi Techniques

The results of Delphi techniques in the second round were were also continually consulted to the sponsor. Based on the analysis and the continual consultation, the researcher designed the final partnership management model. The product model was elaborated in the development guidelines of the model in four phases: (1) planning; (2) implementing; (3) monitoring; and (4) evaluation. The four phases were conducted in the curriculum and learning affairs of the industrial working practice. The product of the field testing of the management model was intended to attain feedbacks and suggestions through the level of component importance and model indicator percentage. After the model had received more feedbacks and further revisions, the researcher improved the model until the model was accepted by the institutions of technological and vocational education in the City of Banda Aceh and the nearby regions. The final model referred to the management of partnership between the vocational high schools and the employment domain in terms of curriculum affairs of industrial working practice. The final model was then put into the field testing in all of the technological and vocational institutions. After the field testing had been done, the researcher, together with the sponsor, revised the model further into the guidelines of the management model. The final management model for the partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice is shown in Figure 5.

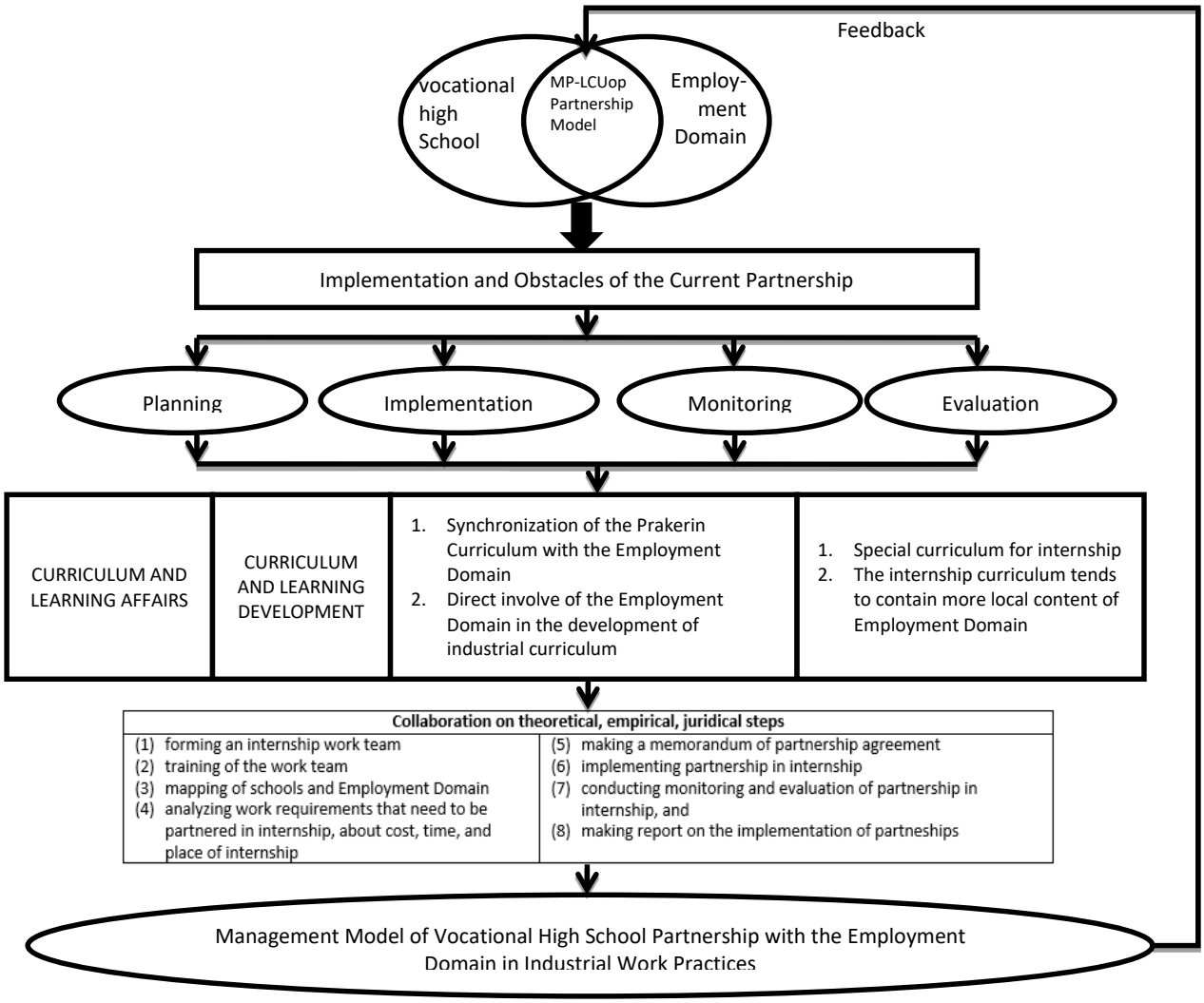

Figure 5. The Final Management Model for the Partnership Between the Vocational High Schools and the Employment Domain in the Curriculum of Industrial Working Practice

Preliminary Experiment and the Revision

Borg & Gall (1983, pp. 771–794) stated that the first experiment would be called as the preliminary experiment and within the preliminary experiment of the study the researcher would like to test the development feasibility of the management model for the partnership between the vocational high schools and the employment domain. In this case, the test was performed with the asistance of practitioners and academicians. The preliminary experiment was conducted by distributing the product of the partnership development with four managerial functions: (1) planning, (2) implementing, (3)monitoring, and (4) evaluating, directed to the curriculum affairs in the industrial working practice. The preliminary experiment involved several subjects: vocational education experts, vocational education practitioners (such as vocational high school principals and vocational high school vice principals), and the employment domain. The main objective of the the preliminary experiment was to attain feedbacks regarding the substance in the instruments of the partnership model with the four managerial phases of (1) planning, (2) implementing, (3) monitoring, and (4) evaluating. The substance of the instrument included the curriculum affairs of industrial working practice, starting from the background of the research, the language that had been used, the content clarity, the number of question items to the feedback sheet. The instrument consisted of 4 components with 6 indicators. Based on the comments and suggestions from the respondents, both in the draft and in the feedback sheet, the researcher found that the guideline concepts needed to be revised as a preliminary product revision. The results of the preliminary revision was used as the basis for the next experiment.

One of the characteristics in the management model was that the model had been simple in terms of implementation with quite complete information. As a result, the management model had been one of the alternatives that might be used by the vocational high schools for establishing partnership with the employment domain in the curriculum of industrial working practice. The model had been tested qualitatively and the results showed that the management model was regarded as practical, objective, and efficient.

The management model for the partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice was supported by the model guidelines that had been quite brief, clear, and complete. Therefore, the management model was easy to be implemented by the vocational high school practitioners in the field especially as guidelines in establishing partnership with the employment domain in terms of designing the industrial working practice curriculum. The reason was the management model had characteristics that were similar to those of the vocational high schools. The developed model was different from other models in the following aspects: (1) the direct involvement of the curriculum department in establishing the partnership with the employment domain in the curriculum of industrial working practice; (2) the efforts that should be done by the curriculum department in establishing the partnership with the employment domain in terms of the activities of industrial working practice curriculum; (3) the importance of the curriculum department involvement in the monitoring toward the partnership between the vocational high schools and the employment domain in terms of the industrial working curriculum; and (4) the role of the curriculum department in the evaluation of the partnership between the vocational high schools and the employment domain in terms of the industrial working practice curriculum.

Product Strengths

The strengths of the management model for the partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice were seen as follows. (1) The partnership management model had been developed based on the results of documentation study and initial survey toward several vocational high schools and the surrounding industries. The initial survey was conducted in order to ensure the partnership between the vocational high schools and the employment domain. (2) The constraints in the implementation of partnership between the vocational high schools and the employment domain had been a very important benchmark for developing the partnership management model that would offer solutions for overcoming those constraints. (3) In addi-

tion to having been based on the strong partnership theory and equipped with partnership objectives and partnership benefits, the partnership management model had also been equipped with the implementation models and the partnership principles developed by the partnership experts. (4) The collaboration of theoretical, empirical, and formal partnership phases in the development guidelines of the partnership management model had increased the ease of implementing the model guidelines for the partnership between the vocational high schools and the employment domain. (5) There had been positive responses from the employment domain toward the management model for the partnership between the vocational high schools and the employment domain due to the ease in implementing the partnership with the vocational high schools in terms of industrial working practice curriculum. (6) There had been great involvement from all of the school members under the department of curriculum in the industrial working practice and in the management mode for the partnership between the vocational high schools and the employment domain in the industrial working practice curriculum. The great involvement made the level of responsibility in the partnership between the vocational high schools and the employment domain improve because the four managerial phases in the model were similar among the vocational high school students.

Product Weaknesses

The management model for the partnership between the vocational high schools and the employment domain in the curriculum of industrial working practice had several weaknesses that can be seen as follows. (1) The validation of the partnership management model had not been disseminated due to the limited time. Dissemination was only provided to the experts and the practitioners. As a result, most of the vocational high school authorities had not been familiar with the characteristics and the implementation of management mode in the model. (2) The partnership planning was less difficult to be designed; however, the partnership implementation, monitoring, and evaluation heavily demanded certain skills. As a result, continuous training programs were needed for the teachers and instructors. The reason was that sending vocational high school supervising teachers to the employment domain and instructors to the vocational high schools was merely a visitation and was not a direct involvement in the industrial working practice. (3) The absence of a working team in the partnership was a big constraint for the implementation of management model because without a solid working team the partnership would be less directed and less responsible. (4) There had been so many managerial activities in implementing the development of the partnership management model. These covered planning, implementing, monitoring, and evaluating activities toward the school affairs in the curriculum of industrial working practice. Therefore, the schools also needed a huge amount of fund.

CONCLUSION

From the results of the research and development study, the following items of conclusion can be drawn. First, the partnership management model has been implemented by all of the vocational high schools in the City of Banda Aceh. However, the implementation of the model has not been in accordance with the theories and phases of a clear, integrated model. The recent partnership indeed has been more focused on the implementation of the students' industrial working practices in the employment domain. Unfortunately, the partnership has not totally subjected to the managerial activities of planning, implementation, monitoring and evaluation especially in the curriculum affairs of industrial working practice.

Second, the constraints that have been encountered in the partnership management model can be delineated as follows: (a) there has been lack of planning for the management model for the partnership between the vocational high schools and the employment domain; (b) most of the implementation of the partnership management model has been under the initiative of the vocational high school rather than the employment domain; (c) monitoring toward the implementation of the partnership management model relies more on the evaluating activities; and (d) most of the evaluating activities of the partnership management model have been focused only on the psychomotoric aspects.

Third, the development of the model is still limited to the curriculum development for

the productive subjects only. Actually, the important components and indicators in partnership within the curriculum and learning affairs are as follows: (a) having curriculum and learning development; (b) having synchronization between the curriculum and learning for the industrial working practice and the curriculum and learning for the employment domain; (c) having direct involvement of the employment domain in the industrial working practice development; (d) having industrial working practice-specified curriculum and learning; and (e) having employment domain local content-curriculum and learning for the industrial working practice.

Fourth, the apparent product characteristics of the partnership management model refers to the involvement of the four managerial phases of planning, implementation, monitoring, and the evalua-tion. It has been found that the model that has been developed by means of planning, implementation, monitoring, and evaluation has been regarded as effective.

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DEVELOPMENT OF WEB-BASED INTERACTIVE MULTIMEDIA FOR HUMAN RESOURCE MANAGEMENT LEARNING IN VOCATIONAL HIGH SCHOOLS

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Abstract

The purpose of this study is to find out the feasibility and the effectiveness of web-based interactive multimedia called EMMASY. This multimedia was developed for learning automation of the personnel administration in vocational high schools. The type of this research is a research and development using the design of learning multimedia development from Alessi and Trollip which includes planning, design, and development. At the development stage, alpha test was conducted by the experts of media and materials to determine the feasibility followed by beta test by the users to find out the usefulness and summative test to find out the effectiveness. In summative test, the sampling technique was purposive. The data of Interviews and observation were analysed descriptive-qualitatively while the data of questionnaire and tests were analysed descriptive-quantitatively. The results showed that EMMASY is very feasible as a learning multimedia with the media-expert's score of 93.12% and the material-expert's score of 93.75%. The result of the usability test showed a score of 79.6% with feasible category. The result of summative test using independent samples t-test showed t-test significance value of 0.008 less than 0.05. In addition, $t_{obs} > t_{table}$ (9.009 > 2.048) meaning that there is significant mean score difference of the students' knowledge in experimental and control classes; so EMMASY is considered effective to improve students' understanding of human-resource-management materials.

Keywords: *interactive multimedia, web, human resource management, vocational high schools*

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INTRODUCTION

Vocational High Schools, as a form of vocational secondary education providers under the auspices of the Directorate of Vocational High School Development, are vocational education institutions oriented to the formation of Life Skills that train students to master the skills needed by the industries, teach entrepreneurship, and form life skills. Students' skill mastery needed by the industries is obtained through the learning process. The process is more emphasized on the good practices undertaken in schools and in the imtership in industries. Thus, vocational high school graduates are expected to have experience and to be ready to enter work-field. Practical learning is present in the productive subjects of the interest in the related expertise program. Productive subjects are divided into three groups namely C1 group for basic areas of expertise, C2 group for basic expertise programs, and C3 group for expertise competence subjects. Productive subjects that emphasize on practices are in the C3 group or the subjects for expertise competence. This C3-group will be the provision for students in carrying out industrial internship in accordance with their expertise programs.

Each expertise program has different outcomes. One of the existing expertise programs in vocational high schools in accordance with the Regulation of The Directorate General of Primary and Secondary Education, Ministry of Education and Culture Number: 07/D.D5/K-K/2018 about Vocational High School (SMK) /Islamic Vocational High School (MAK) (Direktur Jenderal Pendidikan Dasar dan Menengah, 2018) is Office Management with Automation Expertise Competence and Office Management. The prior expertise program was the Office Administration. Based on the Decree of the Minister of Manpower of the Republic of Indonesia No. 183 Year 2016 on the Establishment of Indonesian National Competency Standards in the Category of Office Supporting Activities and Others of Professional Administration, Office Administration expertise program aims to produce competent graduates to be office administrative, junior administrative assistants, administrative assistants, executive administrative assistants, office administrative managers, and corporate secretaries.

One of the vocational high schools that opens the expertise program of Office Administration is SMK Negeri 1 Bawang in Banjarnegara. Based on the preliminary observation, the competencies studied in the productive subjects by the students and then most often done in internship are administrations, from the process of making, receiving, collecting, data-collection and copying, and documenting data /information, and others obtained in the work unit. In fact, during the learning process at schools, students find it difficult to understand productive subjects.

Based on the results of the preliminary observation on August 10, 2017, it was found that one of the productive subjects considered difficult to be understood is personnel administration. In terms of instructional media used by the teachers, they have been combined but limited only to theoretical learning in the classroom. Then, viewed from the facet of the learning method in discussion, the media were quite interesting for the students, but they often found the information through internet so that they felt the materials were not in accordance with the test questions. In addition, during the internship program, they said that they got the task of organizing office personnel documents. The task is different from what is taught at schools because students do not practice or have simulation related to the flow of human resource management in the work-field. In fact, practical learning for vocational students is very important so that they easily understand the theory to master the competence as expressed by (Damarjati (2016) on the official website of www.psmk.kemdikbud.go.id that practical learning for vocational students is important for the assessment of their success that must be "Hands-on" or in accordance with performance in the work-field.

The results of the preliminary survey indicate that the students of class XI of the Office Administration (XI AP) in SMK Negeri 1 Bawang still find it difficult to understand the personnel administration materials. A total of 57 from 81 students representing the XI AP 1, XI AP 2 and XI AP 3 classes stated that personnel administration materials are difficult to understand because the subject matter is related to the government regulation on employment and the articles that must be memorized. Then, the results of students' needs-analysis showed that 80 of 81 students stated that the development of instructional media on personnel administration is needed so that the class is not boring and the materials are more-easily under-

stood. A total of 78 from 81 students agreed that the developed media can be used to practice in personnel administration learning. According to them, if the learning is done by direct practice such as making the office personnel documents, they will be more familiar with the flow of human resource management, not only memorize its provisions of the articles in the government regulation. In line with Drake, Ahern, Roche, & Winner (2014, p. 178), teaching and learning activities that include group collaboration, task visualization, and simulation through laptops, internet, and hands-on experiments are the elements that can enrich students' understanding.

Based on the result of the interview with the teacher of personnel administration subject, in teaching for 3 years, learning has been conducted more by memorizing the articles of the Government Regulation on Civil Servants. It makes the students difficult to understand the materials because they do not practice directly. In fact, the materials of personnel administration are about procedural knowledge. Procedural knowledge is an understanding of how to apply learned concepts in problem-solving situations Wolfer (2000, p. 2). The teacher also stated that in the latest curriculum structure, there is a competency unit related to operating software applications. Therefore, it is very necessary that the learning media can be used for student practice so that they do not get bored to learn personnel administration.

Based on the result of the interview with the teacher of personnel administration subject, there is a gap, in which the basic competencies that must be mastered by the students, have not been supported with adequate learning media so that the use of ICT media is needed. As revealed by Kim (2011, p. 1)), students can not understand theories and concepts clearly when the technology approach to practice in learning is lacking. The concept of learning in vocational high schools requires the latest facilities for practice. The necessary facilities can be the innovation in the development of learning media. Teachers must understand how to teach using classroom learning media that can trigger students' interests (Pate, 2016, p. 91).

The media developed in the subject of personnel administration in vocational high schools can be web-based interactive learning multimedia used as simulation media in applying the automation of human-resource-management. The cognitive learning multimedia theory developed by (Mayer & Moreno (2003, p. 44) mentions that the content displayed in the learning multimedia will affect the thinking process of the students which then strongly influences their long-term understanding on the materials being studied. Web-based learning media will make them more independent in building complex knowledge by linking scientific ideas and will facilitate teachers in monitoring the learning activities of each student (Petra, Jaidin, Perera, & Linn, 2016, p. 263). Web-based multimedia can be used for simulation in learning which will facilitate the students in understanding the materials.

The result of the research by Nkhoma et al. (2014, p. 45) revealed that learning with game simulation has positive effects on cognitive learning outcomes. Trieb (2016, p. 301) also suggested that web-based applications can build students' interests and can strongly enrich their interactive communication skills. The advantage of the use of web-based learning media as simulation media in learning will be in accordance with the characteristics of the complex human-resource-management materials which require database and data integration to produce documents. Today's software to develop webs is RDBMS (Relational Database Management System). Utilizing RDB can make the software more interactive and make it easier to organize different types of data formats (Nigrelli et al., 2013, p. 101).

The characteristics of basic competencies in personnel administration in accordance with the Curriculum 2013 include: grouping employment policies, making office personnel documents (in procurement, transfers, employee positions, leaves, performance evaluation, and the dismissal of employees), and managing individual employee documents. The basic competecies containing procedural knowledge are ultimately expected to be practised, and students can understand the flow by applying web-based interactive multimedia on the automated human-resource-management. The use of multimedia together with case-based learning approaches improves overall students' performances (Bider, Henkel, Kowalski & Perjons, 2015, p. 130). The use of technology in learning will make students more easily understand the taught materials and support skills acquisition in accordance with the expected competencies (Hassan, Puteh, & Buhari, 2015, p. 324).

A research and development of web-based interactive multimedia on the competency of Office Administration in vocational high schools was conducted by Ashari (2015, p. 92) who developed a computerized simulation learning media on archiving called Manual and Electronic Recordkeeping Simulator (M.E. R.S). The difference between his research and the current research is that the media developed in this study is used for simulation learning media of personnel administration so that there are differences in the materials and the variation of simulation features tailored to the needs of the users, teachers and students.

A research-and-development is closely related to the use of Information and Communication Technology (ICT). The utilization of technology on some media can support collaboration activities between teachers and students so that students can be more active and interactive in the learning process. Based on the grand theory of multimedia learning, dual-coding theory (Paivio, 2006, p. 2), Schüler, Scheiter, & van Genuchten (2011, p. 210), multimedia in the forms of images and texts bring up different representations pointing to the same information in long-term memory. As a result, the information is more likely to be available and accessible when compared to text-only. According to this hypothesis, the effect of multimedia in learning depends on the students' access to information in long-term memory. Meanwhile, Clark (1994, p. 27) stated that media delivery (web-based or face-to-face) is less important than learning methods in developing declarative and procedural knowledge. On the other hand, Bruno, Silva, Silva, & Teixeirav (2012, p. 201) found that the use of webs as learning media platforms can be a solution for storing and sharing learning materials more easily because of the centralized information.

Based on the above description, the researcher developed an interactive learning multimedia as a solution to the problems found in the learning of personnel administration. The purpose of this research and development is to find out the feasibility of EMMASY as a simulation learning media on the automation of human-resource management to improve students' understanding of the personnel administration materials in terms of procedural knowledge. The second objective is to test the effectiveness of EMMASY as a simulation learning media to improve students' understanding of personnel administration materials in terms of procedural knowledge.

RESEARCH METHOD

This research is a Research and Development (R&D), which aims to produce a product that can be used to fix and improve the quality of education, covering various aspects of education. In this study, the researcher developed a learning media product in the form of interactive multimedia on the automation of human-resource management called EMMASY to improve students' understanding on human-resource materials in class XI of Office Administration. With regard to interactive multimedia, Alessi & Trollip (2001, pp. 410–413) mentioned that there are several stages in research and development-planning, design, and development. The stages of development in this study are:

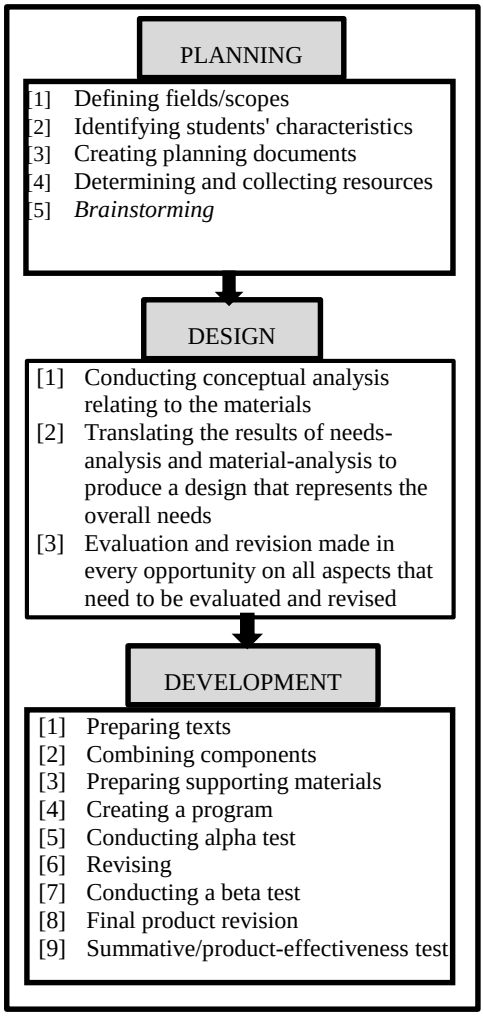

Figure 1. The stages of development

The data of the study were collected using the following techniques: interview, observation, questionnaire, and tests. Interview was used to obtain initial information about the problems faced by the teacher and the students related to human-resource-management learning. Observation was undertaken to observe the learning process of human-resource administration related to the media used so far. In addition, questionnaire used in this research was Likert-scale questionnaire. It was used for the validation of the experts of materials and media at the time of the alpha test. It was also used to assess the students' responses in the beta test on the use of the developed EMMASY interactive multimedia. Further, the tests used during summative test were pre-test and post-test to find out the effectiveness of EMMASY interactive multimedia as simulation learning media that can help the students understand the human-resource-management materials in terms of procedural knowledge.

RESEARCH RESULTS AND DISCUSSION

Planning

Defining Fields or Scopes

Determining the goal of producing interactive multimedia product of EMMASY with a focus on human-resource-management materials in class XI of Office Administration Expertise Competence in the vocational high school.

Defining Students' Characteristics

The students of Class XI of Office Administration at SMK 1 Bawang consist of 108 students with the division of 5 males and 103 females. Their knowledge in ICT has been very good. This is because they have learned Digital Simulation and Office Technology accompanied by the advances in technology and internet. Most students have got e-mails and some social media accounts like Facebook, Twitter, and others. Based on these characteristics, they need up-to-date learning media in line with technological developments in businesses and industries.

Creating Planning Documents

1) Preparing human-resource-management materials and matching the personnel administration materials and the sources with the syllabus to process accordingly.
2) Collecting and determining resources to complete the required documents, such as video tutorials, audio, and animations.
3) Summarizing lengthy and complicated materials so that the students can more-easily understand.

Supporting Resources

Analysing the supporting resources conducted on August 10, 2017. Based on the obtained data during the preliminary survey of the computer laboratory, it was found that the facilities owned by the school to support the lesson were very adequate. These facilities include a computer lab, internet network, wi-fi hotspot, and LCD projector. The availability of wi-fi hotspot helps the students to access internet in the school environment.

Brainstorming

Brainstorming was done to get ideas. This was done to determine the materials to be included in the web-based EMMASY multimedia. Brainstorming was conducted by discussing with the teacher and the advisers related to the material content planned in the making of the multimedia.

Design

This stage was carried out by analysing the concepts and tasks related to the materials, translating the results of needs and material analysis to produce the design that is considered to represent the overall needs, as well as doing evaluation and revision in every opportunity on all aspects that need to be evaluated and revised. After translating the results of needs and material analysis, the researcher made the blueprint of EMMASY interactive multimedia design. The system design stage is the following stage of the data and information needs analysis phase by designing flowcharts and storyboards. In the blue-print of EMMASY application design, especially in the simulation section, there are flowcharts consisting of Usecase Diagram design.

Development

At this stage, EMMASY was developed based on the design that had been prepared. The process comprises of:

Preparing Texts

The first stage that researcher did on development was to prepare the texts. The preparation of the texts in question was to prepare all the materials and the data that would be inserted into the multimedia according to the storyboard. The data are in the forms of materials, titles, menus, and everything that support the texts (materials and questions) in the making of EMMASY multimedia. The materials to be displayed are referenced from the curriculum, syllabus, and lesson plan. The assessment of the syllabus and the lesson plan used in this multimedia development research was the result of collaboration with the teacher of personnel administration subject in SMK Negeri 1 Bawang Banjarnegara with the basic competence of Applying the Automation of Human Resource Management. Then, the next step is to determine and collect the materials from the labor law and the module on personnel administration materials after the design stage of multimedia learning as a reference in preparing the materials of learning multimedia on applying automation of human-resource management.

Table 1. The Developed Basic Competencies

Basic Competencies	Indicators
Conducting employee procurement	Implementing the stages in the procurement of employees Creating employee-procurement documents
Managing employee-career development	Creating a promotional/transfer document using computers in accordance with the procedure
Managing employee-performance evaluation	Creating a performance-evaluation document using computers in accordance with the rules and regulations
Carrying out employee-leave management	Creating leave documents using computer applications
Carrying out the management of employee retirement and dismissal.	Creating dismissal and retirement documents using computer applications

Source: The Syllabus of Human-resource-management Subject

Making Web-based EMMASY

After collecting the materials, the researcher analysed the concept related to the materials on the multimedia that would be developed and collected the materials in the forms of texts, images, and animations from various sources. Next was describing the product prototype in more details with regard to the features of the product ranging from the functions of the developed multimedia, materials, simulations, evaluation features, and other information related to the developed multimedia. The product developed is interactive web-based multimedia called EMMASY which stands for Employee Management Learning System. This product has the following spesifications:

Software

The software used in the development of EMMASY are *Sublime Text 3* as text editor, *LAMPP* as localhost server, *Phpmyadmin* as database processor, *Inkscape* and *GIMP* for image and design processing, and *Mozilla Firefox browser version 39*, and the latest *Google Chrome* used to perform EMMASY trials.

Programming Language

The programming language applications used in making and developing EMMASY were *HTML5*, *CSS3*, *PHP5*, *Javascript*, *JQuery*, and *MySQL*. *HTML5*, *CSS3*, *Javascript*, and *JQuery* were used as client-sides while *PHP5* and *MySQL* were used as server-sides and as database processing. The User Interface (UI) and User Experience (UX) used *Bootstrap framework library* and other libraries such as *fastclick*, *sweetalert*, *ionicon*, *glyphicon*, and *animate* plug-in.

Hardware

The hardware used in the making and the development of interactive web-based EMMASY prototype are two laptops with minimum of 2GB RAM, *Intel Core i3 Processor* with *Ubuntu 17.04 Linux Operating System*, and *Windows 10*. These devices were used to build, design, develop, and test EMMASY on different operating systems.

Multimedia Content

After collecting the materials, the researcher analysed the concept related to the materials on the multimedia that would be developed and collected the materials in the

forms of texts, images, and animations from various sources. Next was describing the product prototype in more details with regard to the features of the product ranging from the functions of the developed multimedia, materials, simulations, evaluation features, and other information related to the developed multimedia. EMMASY Multimedia is accessible on the *website*, http://emmasy.smkn1bawang.sch.id. The product prototype is divided into three main parts:

Materials

The materials can be uploaded by the teacher of human-resource-management subject who gets verification from the administrator. The uploaded file formats are video, *pdf*, images (*jpeg*/*PNG*), and *doc*. Students can read and download the files of the materials.

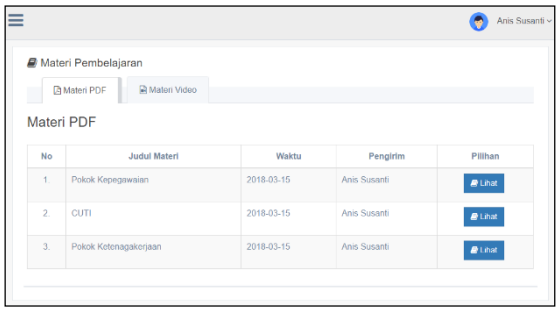

Figure 2. Material Menu Display

Simulation

In the simulation section, there are features to apply the automation of human-resource management, ranging from recruitment, selection, performance evaluation, transfers and promotion, the application of leaves, and the dismissal of employees.

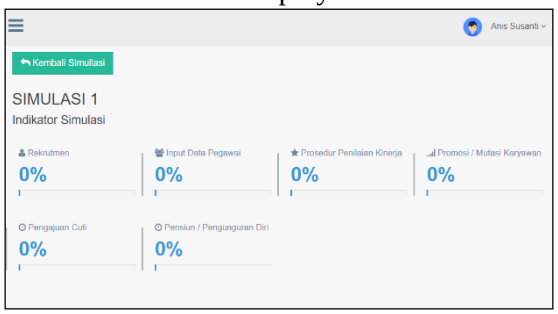

Figure 3. Simulation Menu Display

Evaluation

In the evaluation phase, teachers can upload multiple-choice questions to measure students' understanding at the end of the simulation session of human-resource administration. There are three parts in this phase - pre-test, exercises, and post-test. To start the simulation, the students must first do the pre-test, to measure the initial knowledge before using EMMASY.

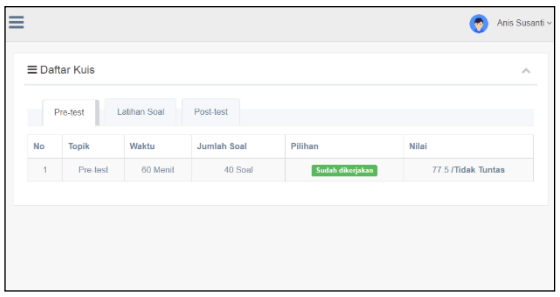

Figure 4. Evaluation Menu Display

Input Media

The media to be included into the website come from various sources including the materials in the forms of *pdf*, *doc*, and video file formats. The materials with *doc* and *pdf* formats were uploaded by the teachers. The uploaded videos come from the works of the Office Administration students, *YouTube.com*, and internet. On the other hand, the animation files obtained from the internet have been modified using *GoAnimate* to be more effective and communicative. The questions on the evaluation menu were prepared based on the questions used by the teacher of personnel administration subject. The questions on the evaluation menu were prepared based on the questions used by the teacher of personnel administration subject.

"Upload Materials" Page Display

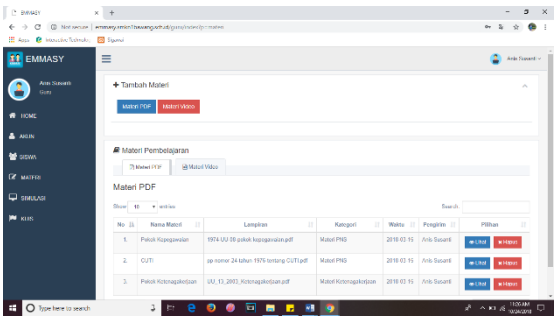

Figure 5. "Upload Materials" Page Display

Test-Page Display

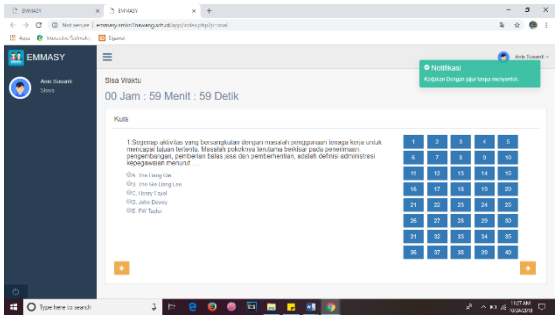

Figure 6. Test-Page-and-Exercise Display

Combining the Components

The Components collected previously were arranged and combined to make the display of web-based multimedia more interactive and systematic. The Components collected previously were arranged and combined to make the display of web-based multimedia more interactive and systematic.

Landing Page

Figure 7. Landing Page

"About EMMASY" Page

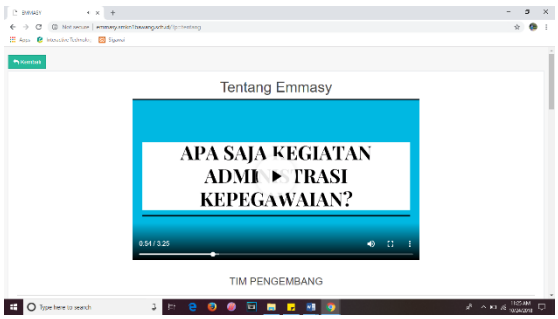

Figure 8. Opening Video Display about Core Competencies, Standard Competencies, Learning Objectives, and Indicators

Main Menu Page

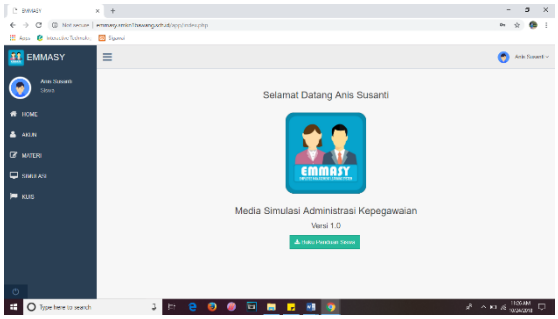

Figure 8. Main Menu Page

Material Display

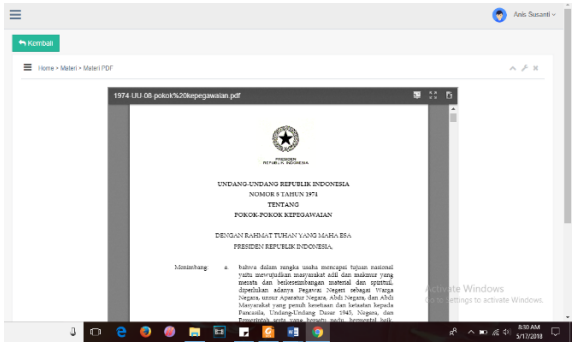

Figure 9. *Pdf* Material Display

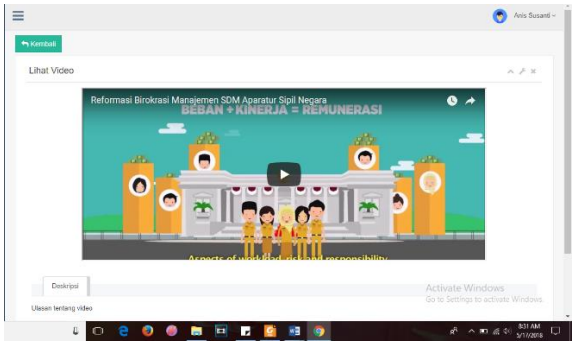

Figure 10. Video Material Display

Simulation Menu Display

Figure 11. Simulation Navigation

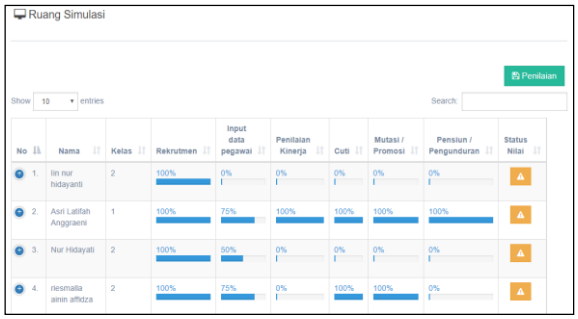

Figure 12. The Display of Viewing the Simulation Recap from the Teacher User

Trials

The design of this product test refers to the design of the development trial developed by Alessi and Trollip (2001, pp. 548-550) located at the development stage. Trial design was conducted to determine the weaknesses of the product produced and to determine the level of its effectiveness in the learning process. Formative test design was carried out through two stages of testing, namely alpha test and beta test. Both tests were to determine the feasibility of the developed media. The required steps for the formative test are as follows:

Alpha Test

Alpha test is the ultimate test for testing media product performed by competent experts. It was done by the material and media experts to validate the product (formative evaluation). The material experts consist of practitioners, 1 teacher of Personnel Administration and 1 lecturer of Human Resource Management (MSDM). The media experts consist of 1 information-system practitioner and 1 academician of educational technology. The alpha test was done by testing the product by an expert, followed by the first revision process of the developed media.

Table 2. The Results of Media Trial

Scoring Aspects	Experts' Scores	Expected Scores	Feasibility Percentages
Display	147	160	91,87%
Software	151	160	94,37%
Total	298	320	
Average			93,12%

Source: The date processed in 2018

Based on the results of the learning multimedia assessment by media experts, the feasibility percentage score from the aspect of media display is 91.87% and of the software is 94.37% so that the average feasibility percentage is 93.12%. The scores indicate that EMMASY multimedia is categorized as very feasible

Table 3. Results of Material Experts' Analyses

Scoring Aspects	Experts' Scores	Expected Scores	Feasibility Percentage
Trustworthiness	31	32	96,87%
Depth	29	32	90,62%
Newness	30	32	93,75%
Readability	15	16	93,75%
Total	105	112	
Average Score			93,75%

Source: The data processed in 2018

Based on the assessment table of multimedia learning by material experts, the feasibility percentage of the trustworthiness is 96.87%, of the material depth is 90.62%, of the newness aspect is 93.75%, and of the readability aspect is 93.75% so that the average feasibility percentage is 93.75%. The scores indicate that the material feasibility category of EMMASY is very feasible.

Beta Test

Beta test is a revised final product test according to the experts' recommendations on the alpha test. It was conducted by performing a limited test to determine the feasibility of using EMMASY interactive multimedia objectively by making a questionnaire about user satisfaction in terms of usability aspect. In beta test, a sample of 9 students with high, medium, and low ability levels was selected based on the teacher's recommendation. The beta test on learning media was carried out after the feasibility test by the media and material experts. It was conducted by filling out the questionnaires by the students after trying to use EMMASY learning media. There were 9 students consisting of three students with high ability, three with moderate ability, and the others with low ability. The questionnaire consists of 20 questions in the ISO standard 9241: 11 (ISO/IEC, 2011) and Rubin & Chisnell (2008, pp. 4–5). The result of the beta test by students are shown in Table 4.

The results of the students' evaluation on EMMASY web-based multimedia show that from 20 questions, the score obtained is 573 from 720 showing the percentage of 79.6% with

"feasible" category. Based on the score, it can be concluded that the web-based EMMASY interactive multimedia is feasible and and can be used as a medium of personnel administration learning on the basic competence of Making Office Personnel Documents using Com-puter Applications in Vocational High Schools of Office Administration Expertise Competence.

Table 4. The Results of Beta-Test Analyses

Scoring Aspects	Students ' Scores	Expected Scores	Feasibility Percentages
Learnability	170	216	78,7%
Efficiency	89	108	82,4%
Memorability	90	108	83,3%
Errors	84	108	77,8%
Satisfaction	140	180	77,8%
Total	573	720	
Average			79,6%

Source: The data processed in 2018

Summative Test

Summative test was conducted in the form of field test with pretest-posttest design. The data collection instrument used to determine the effectiveness of this product was a written test of multiple-choices with the questions about procedural knowledge to measure the students' levels of understanding. The ready-to-use media were then implemented to the students to find out the differences caused by the use of web-based multimedia. The summative test was conducted on 30 students selected purposively (purposive sampling) by looking at the differences in the levels of understanding of the materials viewed from the test results before and after the treatment using EMMASY web-based simulation learning multimedia. The observed class was class XI of Office Administrative. The data were analysed using quantitative-descriptive statistical test technique and prerequisite test consisting of several types of tests such as normality and homogeneity tests. T-test was used for Hypothesis testing.

The final product testing was done through summative test to find out the effectiveness of EMMASY multimedia using pretest-posttest design in the form of multiple-choice questions about the procedural knowledge of human-resource administration. The effectiveness test was carried out using one-group-pretest-posttest design. The two groups divided into the experimental and control groups were first given a pre-test to determine the initial condition, whether there is a difference. Based on the results of the test, different treatments were given and ended with a post-test to measure the students' understanding from both groups.

The results of the summative test through t-test (independent samples test) in the pre-test between the experimental and the control classes show that the significance value of t-test is 0.312 greater than 0.05 and $t_{obs} < t_{table}$ (1019 < 2.048). Thus, H_0 is accepted. It shows that there is no significant difference in the mean of the students' learning outcomes in the pretest between experimental and control classes. Then, treatment was given to the experimental class using EMMASY multimedia in personnel administration learning while usual discussion method was given to the control class without EMMASY multimedia. The results of post-test show that the average score of the students in the experimental class is 89.67 while that in the control class is 85.91. Based on these results, the learning outcome of the experimental class is superior to that of the control class. The students' ability in achieving the learning outcomes has already represented the understanding of the materials being studied since multiple-choice questions are about procedural knowledge. As described by Piontek (2008, p. 3), multiple-choice questions can measure a wide range of knowledge, including students' understanding of terminology, facts, principles, methods, and procedures, as well as their ability to apply, interpret and justify.

The average knowledge score of the students from the experimental class in pretest is 56.92. After the treatment with simulation learning using EMMASY, the average score increases to 89.67. These results indicate that there is an increase in students' learning outcomes in terms of the knowledge score in the subject of personnel administration after using EMMASY multimedia in learning. The scores of the students' knowledge in the experimental class are greater than those in the control class because of the treatment using EMMASY as a simulation learning media of personnel administration. It shows that EMMASY multimedia is effective to be used as simulation media of personnel administration learning to improve students' understanding in terms of procedural knowledge.

EMMASY multimedia is made web-based to make it flexible and accessible anywhere either using smartphone or laptop so that it is easier for students to learn the materials because the ease of use of the media selected can support the effectiveness of learning. As mentioned by Aloraini (2012, p. 76), the use of multimedia programs can provide more effective and more influential experiments than the use of technology separately in learning. Interactive learning media can lead to two-way communication between teachers and students which can increase the students' activities and influence their learning outcomes. The findings of this study are supported by previous research results that interactive-technology-based learning media have significant effect to improve students' learning outcomes (Aloraini, 2012; Prastiyo, Djohar, & Purnawan, 2018; Wibisono, Baedowi, & Indrawati, 2017).

CONCLUSIONS

Based on the results of the research and the discussions, it can be concluded that EMMASY interactive multimedia is feasible and effective for use as simulation media of personnel administration learning. The effectiveness is based on the increasing scores of the students' knowledge. The average score of the students' knowledge in pre-test (before using EMMASY) is 56.92 and that in post-test (after using EMMASY) increases to 89.67. The increase is supported by the t-test result between the experimental and the control classes which shows a significant difference with the significance value of 0.008 < 0.05. The average knowledge score of the experimental class is 89.67 while that of the control class is 85.91. Based on the difference of the knowledge scores after the experimental class received treatment in the form of the use of EMMASY interactive multimedia as a simulation media in personnel administration learning, it can be concluded that the students' understanding in the experimental class is better viewed from the knowledge score compared to the students' understanding in the control class.

The development of web-based EMMASY interactive multimedia is feasible to be used as a simulation media in personnel administration learning and is effective to improve students' understanding of personnel administration materials. The existence of web-based EMMASY facilitates students in obtaining learning materials, attracts them to learn it, and allows them to simulate as the personnel administration staff who works and performs the process of human resource management activities from beginning to end.

This research and development has produced findings that the development of web-based EMMASY interactive multimedia can determine students' understanding and provide insight and media references for teachers. The design of learning can be made by the teacher in accordance with the existing developments, one of which is the development of technology. Learning design with media based on contemporary technology is more effective to trigger students' enthusiasm and motivation as stated by Surjono (2017, p. 48). Based on this explanation, EMMASY can be used as a simulation medium for teachers in personnel administration learning and effective to improve students' understanding of personnel administration materials based on the human resource management system.

Based on the result of the effectiveness test of EMMASY web-based interactive multimedia as simulation media of personnel administration learning in the vocational high school, it is expected that in the future the media can be developed again for other schools with other basic competence scopes that have not been developed in this study.

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THE COMPETENCY-BASED TRAINING MODEL FOR VOCATIONAL HIGH SCHOOL TEACHERS FROM ELECTRICAL EXPERTISE PROGRAMS

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Abstract

The study was to generate a valid, practical and effective competence-based training model for the electricity program vocational high school teachers. The type of the study was research and development that referred to the development stages proposed by Plomp. The data gathering instrument for the study consisted of: (1) validation sheet; (2) observation sheet; and (3) response questionnaire for the training participants and the trainers. In order to measure the level of reliability and the level of agreement consistency among the raters, the researcher implemented the Cohen's Kappa coefficient statistics has a minimum value of ≥ 0.70. The subjects of the study were the electricity program vocational high school teachers in the City of Makassar and the Regency of Gowa totaling 22 people. The results of the study were as follows: (1) the training model had fulfilled the criteria of validity so that the model might be implemented for the training activities of electricity program vocational high school teachers; (2) the training model had fulfilled the criteria of practicality that were measured from the level of model stage (syntax) implementation; (3) the training model had fulfilled the criteria of effectiveness that had the following indicators: (a) the level of knowledge and understanding exposed by the training participants, (b) the level of teaching skills exposed by the training participants, (c) the quality of training participants' portfolio and (d) the response of the training participants and the trainers.

Keywords: *training model, vocational high school teachers, competence*

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INTRODUCTION

Education is a long term investment for the human beings that has strategic values for the sustainability of civilization in the world. Indonesia has placed as the main and the most important aspect through the Law Number 20 Year 2003 (Presiden Republik Indonesia, 2003) regarding the National Education System, the verse 1 of the Law states that Education refers to the conscious and the well-planned efforts of manifesting learning situation and learning process in order that the learning participants might actively develop their self-potentials in order to attain the religious spiritual power, the self-control, the personality, the intelligence, the nobility and the other skills that will be necessary for themselves, the community, the nation and the state. The provision of well-qualified education is heavily determined by the well-qualified teachers.

Teachers have great and strategic role in developing human resources. Teachers are in the front line of educational implementation. Therefore, the teachers should have multiple competencies in relation to their tasks and responsibilities.

The Law Number 14 Year 2005 (Presiden Republik Indonesia, 2005) regarding the Teachers and Lecturers has positioned the teachers as the professional teachers and the learning agents altogether in the same time. In performing the tasks of professionalism, the teachers should have the following competences: learning plan, well-qualified learning implementation and learning results assessment and evaluation.

The development of teacher professionalism should be conducted continuously through the training programs. A professional teacher is a teacher who has the four integrated main competences namely: pedagogic competence, personality competence, social competence and professionalism competence (Presiden Republik Indonesia, 2005).

Pedagogic Competence refers to a teacher's capacity in managing the learning process. Personality Competence refers to a teacher's capacity in managing himself or herself. Social Competence refers to a teacher's capacity in serving as the part of a community. Professional Competence refers to the competences that have been attained through the professional education and the capacity of a teacher in mastering the science, technology and/or art and culture that he or she has been teaching. she will teach.

The position of a teacher is a position of profession. Rusman (2011, p. 16) states that profession is a position or employment that demands certain skills. The statement implies that the professional position might not be conducted or be held by the untrained people or the unskilled people. Instead, the professional position should be held by people who have gone through a process of training and education specifically for the domain that he or she will hold.

Pugach (2006, p. 8) states that a professional teacher is a teacher who has been able to improve his or her teaching quality in order to help the learning participants to develop their self-potentials.

Finch & Crunkilton (1999, p. 258) states that a competeny for vocational and technical education are those tasks, skills, attitudes, values and appreciations that are deemed critical to success, life and/or in earning a living.

Competence in the context of vocational education refers to the mastery of tasks, skills, attitudes and appreciations that have been necessary for supporting the success. The statement shows that comptence includes tasks, skills, attitudes and appreciations that should be possessed by the learning participants in order to perform their learning tasks according to certain jobs.

Multiple problems related to the low quality of the graduates and the low level of graduates absorbance in the employment, especially among the vocational high school graduates, is not apart from the teachers' capacity in managing the learning process. Based on the results of a study by Soenarto (2014, p. 2), not all teachers have been teaching competently, not all teachers have been provided with the programs of competence improvement and the learning process within the classroom has still been classical in which the students are provided with the outdated competences whereas the real world keeps changing.

The teacher competence test (*Uji Kompetensi Guru*, UKG) in 2015 tested the teacher competence in two domains namely the pedagogic domain and the professional domain. The national average score for the UKG 2015 in the two domains of competence had been 53.02. The General Director of Teachers and

Educational Staffs (*Guru dan Tenaga Kependidikan*, GTK) from the Ministry of Education and Culture stated that the national average score for the results of UKG for the pedagogic domain of competence had 48.94 and the average had been under the minimum competnece standards (*Standar Kompetensi Minimum*, SKM) which had been 55.00. In other words, nationally the teachers' pedagogic domain of competnece had been less good and there should be efforts for improving the pedagogic domain.

Based on the data of teacher quality that has been explained above, there should be comprehensive efforts for improving the teachers' competence especially for the vocational high school teachers in electricity domain. One of the solutions for improving the vocational teachers' professionalism is designing training and education programs (*Pelatihan dan Pendidikan*, Diklat). The professional teachers are required to have the academic qualifications that should be relevant to the subjects that they have been teaching and to master the competences as having been required by the Law of Teachers and Lecturers (Presiden Republik Indonesia, 2005).

According to Ndraha (1999, p. 128), training has been a process of professionalism establishment regarding a job in the human. The Competence-Based Training (CBT) is a training program that pays attention to the necesary knowledge, skills and attitudes in the working environment so that the workers might perform their jobs competently. So, the competence-based teacher training program is a training program that will be provided in accordance with the competences that the teachers demand in performing their tasks as a professional educator.

The competence-based electricity program vocational high school teachers training model is to improve the pedagogic competence and the professional competence in the electricity program so that the vocational high school teachers might plan, implement and evaluate the science-based learning process in the electricity program effectively. The competence-based electricity program vocational high school teachers conceptual training model will be presented in Figure 1.

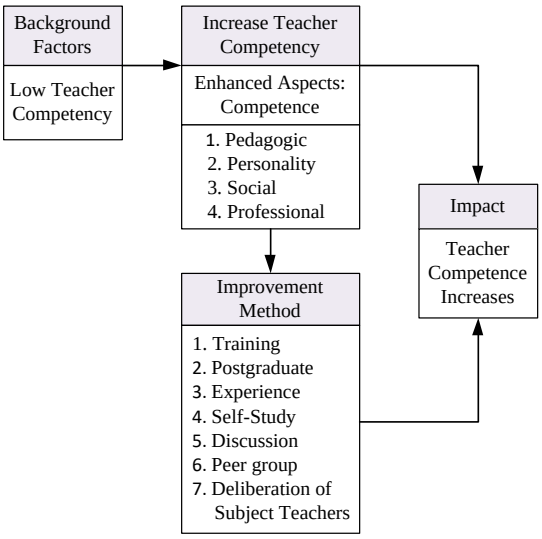

Figure 1. The Competence-Based Electricity Program Vocational High School Teachers Conceptual Training Model

Based on the preliminary survey that the researcher conducted regarding the competences of electricity program vocational high school teachers in several vocational high schools within the City of Makassar, the Province of South Sulawesi, especially in terms of pedagogic competence and professional competence, the researcher found several matters namely: (1) the teachers' capacity in developing the lesson plans based on the syllabus had been low; (2) the teachers' capacity in conducting the learning process and in managing the classrooms had not been maximum; (3) the teachers' capacity in developing the learning materials based on the core competence and the basic competence (*Kompetensi Inti*, KI, and *Kompetensi Dasar*, KD) had been low; (4) the teachers' teaching strategy had been less various; and (5) the teachers' capacity in designing the assessment rubric had still been low.

In addition to the teachers' competences that had been observed, the researcher also observed the types of vocational high school teacher training program that had been provided by the Government. From the results of the observation, the researcher found that the training programs that the electricity program vocational high school teachers used to attend were the industrial internship and the training and education of teacher profession during the certification. On the other hand, there had not been any competence-based electricity program vocational high school teacher training

programs that had been intended to improve the teacher professionalism continuously; as a result, there should be a specific model for the continuous training efforts toward the electricity program vocational high school teachers.

Several empirical findings that have been mentioned above show that the electricity program teachers have not been able to show sufficient performance and have not fully been supported by the sufficient degree of competence mastery. In addition, there has not been any competence-based electricity program vocational high school teachers training model that becomes the human resources development plan in the schools and that is provided by the Office of Education the City of Makassar through the continous training efforts.

In relation to the situation, the American Vocational Association (Thompson, 1973, p. 111) states that "Vocational education as education designed to develop skills, abilities, understandings, attitudes, work habits and appreciation needed by works to enter and make progress in employment on useful and productive basis".

From the above definition, the researcher might infer that the vocational educational has basically been designed to develop the skills, the capacity, the understanding, the attitudes, the job habits and the knowledge for the workers in order to meet and to develop as well as to improve their working skills so that they will be totally useful and productive workers. Similarly, the United States Congress (Djojonegoro, 1998, p. 34) defines the vocational education as an educational program that is directly related to the preparation of an individual in entering certain employment or the additional preparation of an individual's career.

According to Prosser, several principles in the vocational education support the importance of vocational high school teacher competence improvement continously and these principles are as follows: (a) the vocational education will be effective if the teachers have been successful in implementing the skills and the knowledge on the process and the operation of the job that will be performed; and (b) the effective vocational education might only be implemented within a situation in which the training tasks are conducted by using the manners, the tools and the machines that the actual employment operate.

Susatya (2013) in his study has concluded that the development of art and culture program vocational high school teachers training model has been effective in improving the quality of competence mastery, the quality of artwork and the productiveness of training and education participants. On the other hand, a study by Fakhra & Mahar (2014) has shown that the teachers who attend the training programs have better competneces in comparison to those who do not attend the training programs.

Based on the multiple problems that have been explained above, the researcher deems the urgency to develop a training model for the competence-based electricity program vocational high school teachers.

The training model the researcher would like to focus on the improvement of the pedagogic competence and the professional competence among the electricity program vocational high school teachers.

The objectives of the study are as follows: (1) to develop the competence-based electricity program vocational high school teacers training model; (2) to generate the valid, practical and effective competence-based electricity program vocational high school teachers training model; and (3) to generate the competence-based electricity program vocational high school teachers training model that will be responded positively by the training and education participants.

The specifications of the product that will be generated are as follows: (a) the Manual of Competence-Based Electricity Program Vocational High School Teachers Training Model Implementation; (b) the training materials in the form of Tutorial Compact Disc (CD); and (c) the set of evaluation (learning evaluation, product evaluation and response evaluation). On the other hand, the research instruments that will be developed are as follows: (a) the instrument of model assessment; (b) the instrument of trainer activities in the learning process; (c) the questionnaire of trainer response; (d) the questionnaire of participant response; (e) the instrument of learning syntax implementation; and (f) the rubric of teacher performance scoring results

The ADDIE (Analysis, Design, Development, Implementation and Evaluation) Training Model (Noe, 2008, p. 6) has been one of the training models that consists of five stages according to the name namely: (1) perf-

orming the needs analysis; (2) creating the training program design; (3) performing the training material development; (4) performing the training material implementation; and (5) performing the training program evaluation .

The researcher adapts the ADDIE Training Model by simplifying the five stages into the three stages as follows: (a) the planning stage that includes the needs analysis, the training objective formulation and the training program design; (b) the training implementation stage that includes the learning activities (the opening, the core and the closing activities) and the tutorial; and (c) the evaluation stage that includes the reaction (response) evaluation, the learning evaluation and the product evaluation. The hypothetical model of competence-based electricity program vocational high school teachers training model is presented in the following Figure 2.

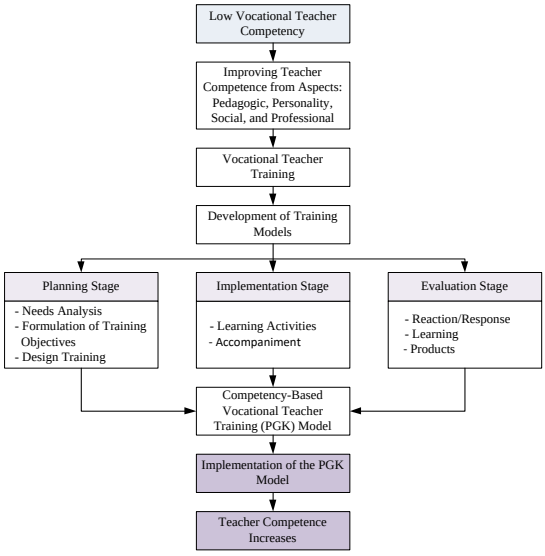

Figure 2. The Hypothetical Model of Competence-Based Electricity Program Vocational High School Teachers Training Model

RESEARCH METHOD

The type of the study was Research and Development. The main activity within the study was developing a competence-based electricity program vocational high school teachers training model in order to improve the vocational high school teachers' professionalism in the electricity programs.

The development of the competence-based electricity program vocational high school teachers training model followed the model development stages proposed by Plomp (1997, p. 5), were as follows: (1) preliminary investigation; (2) design; (3) realization/construction; (4) test, evaluation and revision; and (5) implementation. On the other hand, for the instructional or the learning development the researcher implemented the SCID (Systematic Curriculum Instructional Development) approach proposed by Norton (2008, p. 6).

The subjects in the study were the electricity program vocational high school teachers in the state and the private vocational high schools located in the City of Makassar and the Regency of Gowa that had the electricity engineering expertise study program.

The data analysis technique that the researcher implemented in the study was the descriptive qualitative. In addition, the data that had been gathered by means of research instruments would be analyzed qualitatively and quantitatively.

For the instrument analysis, the aspects that had been assessed in general consisted of manual, content, language and layout with the score ranging from 1 until 4. The validity category of each aspect or of overall aspect that had been assessed would be defined based on the categorization criteria that the researcher adopted from Azwar (2013, p. 163) as follows:

Table 1. The Criteria of Component Assessment

Score Range	Categories
$(M + 1{,}5s) < X$	Very Valid
$(M + 0{,}5s) < X \leq (M + 1{,}5s)$	Valid
$(M - 0{,}5s) < X \leq (M + 0{,}5s)$	Less Valid
$X \leq (M - 0{,}5s)$	Not Valid

Note:
X = The score that had been achieved
M = The mean score
s = The standard deviation

The criterion that the researcher implemented in order to define whether the instrument that the researcher implemented had already displayed the sufficient degree of validity or not was if the mean (M) of the assessment results for the overall aspects had displayed the minimum score then the instrument would be in the "valid" category.

Then, in order to measure the inter-rater reliability toward the research instrument assessment/validation results provided by the ex-

perts the researcher analyzed the results by means of Coefficient of Cohen's Kappa and of Percentage of Agreement proposed by Nitko & Brookhart (2007, p. 80). The assessment sheet would be considered reliable if its coefficient of reliability (r) ≥ 0.70.

Next, a model would be considered practical if the vocational education material experts and the vocational education experts as the field practitioners stated that: (1) the model might be implemented with little revision at minimum; and (2) the model might actually be implemented for all aspects under observation and at least the model displayed the "partly implemented" category.

Last but not the least, a model would be considered effective of the model met the following criteria of effectiveness: (1) the trainer had the capacity to manage the learning process with "good: category at minimum; (2) the learning results might be measured from the results of post-test assessment given at the end of the training model and the results should belong to the "good" category at minimum in comparison to the pretest results; and (3) the trainer's and the training participants' response toward the model implementation should be "positive" at minimum and the trainer objectively stated that the might be implemented for improving the competences of the electricy program vocational high schools.

RESEARCH RESULTS AND DISCUSSION

An effective training should be a training that had been able to achieve the objectives that had been formulated. In relation to the statement, the competence-based electricity program vocational high school teachers training modelwas to improve the teachers' competence in terms of planning the learning process, of implementing the well-qualified learning process and of assessing and evaluating the learning results. The Competence-Based Electricity Program Vocational High School Teachers Final Training Model would be displayed in Figure 3.

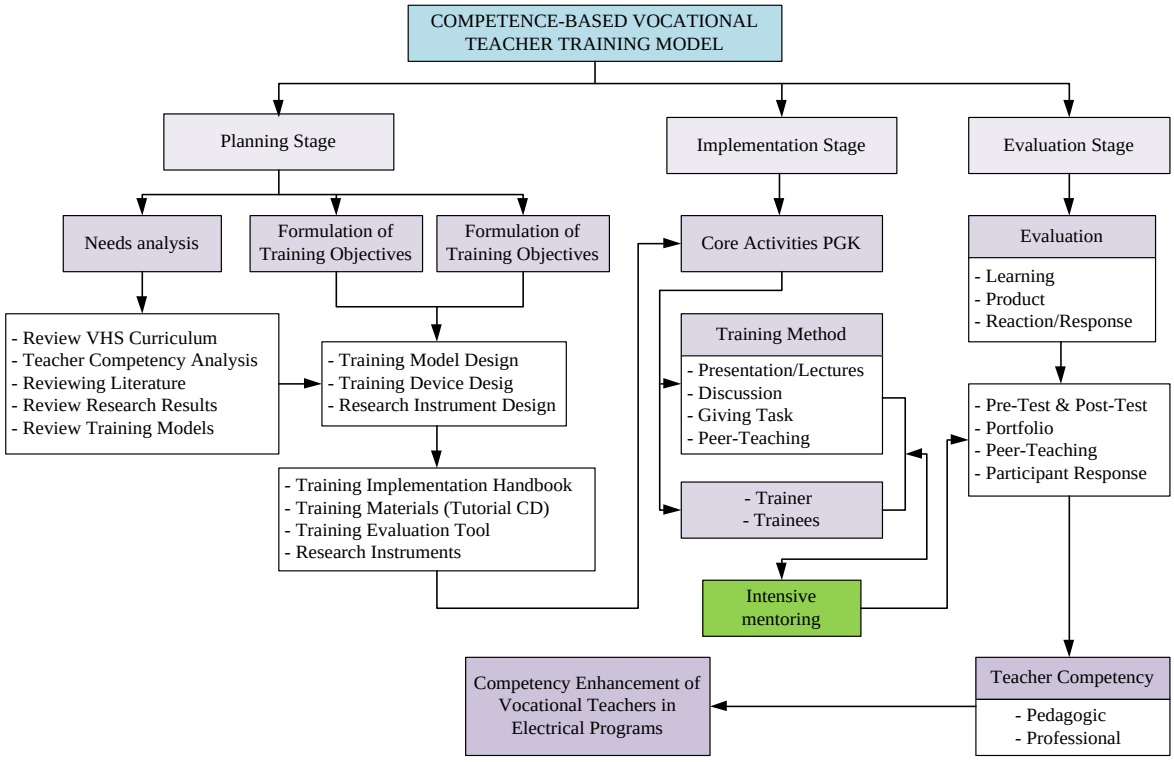

Figure 3. The Competence-Based Electricity Program Vocational High School Teachers Final Model

The Planning Stage

The planning stage was begun by the needs analysis through a review toward the electricity program vocational high schools curriculum based on the spectrum and the structure of 2013 Curriculum for the Vocational High Schools, namely the Installation Engineering of the Electric Power Use, the competences of electricity program vocational high school teachers. The planning stage was based on the preliminary data regarding the low pedagogic and professional competence of the electricity program vocational high school teachers.

Then, the researcher distributed a questionnaire in order to gather the data regarding the competences that the teachers demandedin developing their competences. Based on the results of data analysis, the indicators of competence achievement that the researcher would develop would be the ones for the pedagogic competence and the ones for the professional competence.

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In addition to distributing the questionnaire for determining the competence that should be developed, the researcher also distributed the questionnaire regarding the importance of developing the training sets and the second questionnaire was related to the following indicators: (a) developing the lesson plans; (b) developing the learning materials; and (c) developing the set of assessment for the learning results. The mean score of the questionnaire would be displayed in Table 2.

Table 2. The Score of Training Set Development

No	Aspects under Assessment	Score (%)
1	Lesson Plan Development	88.31
2	Teaching Materials Development	98.18
3	Learning Results Assessment Development	86.36
	Average Score of Assessment	90.90

Based on the results displayed in Table 2, the researcher found that the mean score had been equal to 90.90% from the components that the respondents assessed. As a result, the researcher might conclude that the competences that the researcher developed in the vocational high school teachers (*Pelatihan Guru Kejuruan*, PGK) training model would be the pedagogic competence and the professional competence.

Then, based on the results of analysis toward the competence needs and the training needs that became the basis of instructional development, the researcher formulated the training objectives operationally. The training design consisted of: (a) the training model design; (b) the training sets design; and (c) the research instrument design.

The prototype of competence-based electricity program vocational high school teachers or also known as the PGK (*Pelatihan Guru Kejuruan*, PGK) training model was designed in the form of the PGK manual complete with the PGk training sets (training materials and evaluation sets). On the other hand, the research instrument included: (a) the instrument of trainer's response toward the model implementation; (b) the instrument of participants' response toward the trainer's activities in the learning process; and (c) the instrument of observation toward the model implementation within the classroom.

Table 3. The Results of Research Instrument Feasibility

No	Name of the Instrument	Frequency of (LD) (LDR)
1	PGK Model Assessment Sheet	(1)(3)
2	Training Materials Assessment Sheet	(1)(3)
3	Scoring Rubrics Assessment Sheet	(1)(3)
4	Training Participants' Response Questionnaires	(1)(3)
5	Observation Sheet of Trainer's Activities in the Learning Activities	(0)(4)
6	Model Implementation Assessment Sheet	(0)(4)

Before having been implemented, all of the instruments were assessed in terms of feasibility by the educational experts. The feasibility assessment for each instrument was re-

viewed based on 3 (three) aspects namely: manual, coverage (content) and language. Then, the results of instrument feasibility assessment would be displayed in Table 3.

Before performing the empirical experiment toward the prototype of PGK model and the supporting instrument, the researcher first performed the conceptual validation test with the educational experts/validator.

Based on the criteria of component assessment in Table 1 and the coefficient of reliability (r) ≥ 0.70, from the results in Table 4 the researcher might conclue that all of the assessed instruments had been in the valid and reliable category and might be implemented as the components of competence-based electricity program vocational high school teachers training model.

Based on the results, the researcher might state that all of the instruments had been feasibile for implementation although there were some instruments that should be revised. In general, the researcher would like to conclude that all of the instruments had been feasible for filtering the data on the validity, the practicality and the effectiveness of the competence-based electricity program vocational high school teachers (PGK) model.

The Implementation Stage

The implementation stage was begun with the preliminary activities that provided aperception, motivation and explanation regarding the objectives of the training and the matters that were related to the training implementation as having been written in the manual. Before proceeding to the main activities, the training participants were provided with the pre-test in order to measure the level of their pedagogic competence and of the professional competence before the researcher implemented the training program.

The main activities were the learning material provision. included the theoretical materials, the practical materials and the assignment in terms of portfolio. The training methods that the researcher employed were presentation, discussion, peer-teaching and portfolio. During the training the trainer or the source performed an intensive guidance in order to ease the achievement of training objectives. So, the guidance was adjusted to the condition and the situation that the training participants encountered.

Table 4. The Summary on the Results of Research Instrument

No	Name of the Instrument	Mean Score (M)	Coefficient of Cohen's Kappa (r)
1	Manual Assessment Sheet	3.80	0.806
2	Training Materials Assessment Sheet	3.70	0.799
3	Assessment Sheet of Teacher Performance Rubrics Score	3.70	0.797
4	Training Participants' Response Assessment Sheet	3.60	0.860
5	Trainer's Activities Observation Sheet	3.70	0.833
6	Model Implementation Observation Sheet	3.70	0.848

The concluding activities were the end of the training program implementation in which the trainer provided reflection during the training program implementation, discussed the learning experiences, provided the conclusions, delivered the message and provided the motivation. Before the training program had been ended, the training participants were provided with the post-test in order to measure their understanding and capacity or competence after attending the training program, attending the peer-teaching activities, attending the independent tasks in the form of portfolio and completing the questionnaire of participants' response.

The Evaluation Stage

In this stage, the researcher performed an evaluation in order to measure the effectiveness of PGK Model that had been developed. In conducting the evaluation, the researcher referred to the four-step evaluation that had been developed by Kirkpatrick, or also known as four levels of evaluation (Phillips, 1991, p. 41), and the four levels of evaluation consisted of reaction evaluation, learning evaluation, behavioral evaluation and results evaluation. Within the study, the researcher only conducted three levels of evaluation namely the reaction evaluation, the learning evaluation and the results evaluation.

The reaction evaluation was to identify the level of reaction/response or of opinion, argumentation and comment that the training

participants provided toward the quality of PGK model implementation after attending the training program. In order to identify the leve of training participants' satisfaction, the researcher measured several aspects within the training program. The aspects included: the achievement of training objectives, the strategy and the method that had been implemented in the training program, the training sets, the supporting facility and the evaluation that had been implemented. The instrument that the researcher applied was the response questionnaire in order to identify the respondents' response toward the training provision. The recapitulation on the results of training participants' response analysis might be seen in Table 5.

Table 5. The Assessment of Training Participants' Response

No	Categorization	Frequency	Percentage
1	Very Good	22	100.00
2	Good	0	0.00
3	Poor	0	0.00
4	Very Worse	0	0.00
	Total	22	100.00
	Mean Score	3.82	

Based on the criteria of component assessment in Table 5, the researcher found that the training participants' response belonged to the very good criteria. In general, the researcher might conclude that the training participants provided response, argumentation and comment toward the PGK model implementation in a very positive manner.

The learning evaluation was conducted in order to identify how far the training participants had been able to absorb the knowledge, the skills and the attitudes that had been trained. The learning evaluation in the training program was conducted by comparing the knowledge and the understanding of the training participants before and after attending the training program (pre-test and post-test). The recapitulation on the pre-test and post-test results might be seen in the Figure 4 as follows.

The results in Figure 4 showed that in general the results of training participants' pretest and post-test had significant improvement. In terms of mean score, the pre-test score was 2.40 and the post-test score was 3.01. The significant improvement showed that within the training process there had been significant improvement toward the knowledge and the understanding of the training participants.

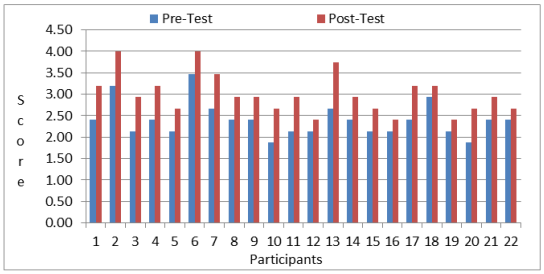

Figure 4. The Historiogram of Training Participants Pre-Test and Post-Test Assesment

In order to view whether there had been differences between the pre-test and the post-test results or not, the researcher performed a non-parametric statistical test in the form of Wilcoxon Test. Score of Asymp. Sig. (0.000) < α (0.050). Therefore, the researcher might conclude that there had been significant difference between the pre-test and the post-test. In other words, there had been improvement on the training participants' knowledge and skills before and after the training provision.

The result/product evaluation might be seen from the training participants' success in designing the products or in the form of independent task (portfolio) consisting of lesson plans and peer teaching activities. The assessment toward the peer-teaching activities were implemented at the end of the final meeting by presenting the tasks that had been given previously. On the other hand, the assessment toward the learning plan was conducted in the form of independent task (portfolio) consisting of lesson plans. The recapitulation on the results from both assessments might be seen in Figure 5 as follows.

Figure 5 showed that in general the results of portfolio and the peer-teaching activities conducted by the training participants had belonged to the good category. The mean score of learning plan (portfolio) had been equal to 3.49, while the mean score of learning implementation had been equal to 3.41. The mean score comparison showed that the teaching level and the portfolio quality in the development of training participants' learing sets had belonged to the good category.

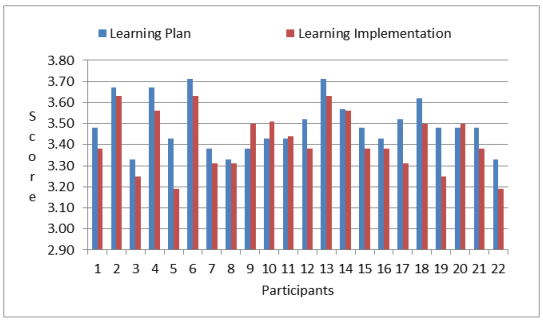

Figure 5. The Historiogram of the Assessment toward the Learning Plan and the Learning Implementation

In order to view whether there had been difference on the assessment results between the learning plan and the learning implementation or not, the researcher performed the non-parametric statistical test in the form of Mann-Whitney Test. Score Asymp. Sig. (0.000) < α (0.050). As a result, the researcher might state that there had been significant difference between the score of learning plan and that of learning implementation.

Based on the results of data analysis toward the model effectiveness (the pre-test score, the post-test score, the portfolio, the peer-teaching activities and the training participants' response), in general the researcher would like to conclude that the vocational high school teachers training model (the PGK model) had been very effective for implementation in order to increase the competences of the electricity program vocational high school teachers.

The assessment toward the PGK model practicality was measured in terms of model implementation level namely the implementation of all training activities in accordance with the learning syntaxes or stages that had been designed. The assessment toward the learning model would be displayed in Table 6.

Table 6. The Results of Observation toward the Model Implementation

Meeting	Observation (%)	PA (%)
1	96.15	92.31
2	92.31	100.00
3	96.15	92.31
4	96.15	92.31
5	100.00	100.00
Mean Score of Assessment	96.15	95.38

The results in Table 6 displayed the results of analysis toward the PGK model implementation within the classroom and the results showed that the mean score of observation had been equal to 96.15% (very good). On the other hand, the results of analysis toward the inter-rater agreement (Percentage of Agreements, PA) within the observation of trainer's activities showed that the average score of PA assessment had been equal to 95.38% (very good).

The results of data analysis showed that both observers had similar perception in observing the trainer's activities within the implementation of learning stages in the classroom. Similarly, the trainer within the experiment displayed high responsibility in implementing the learning stages within the classroom and the display of high responsibility within the implementation of learning stages belonged to the good category.

Based on the results of data analysis in the assessment toward the model implementation, the researcher might conclude that the PGK model had been very practical for the implementation as a training model in order to improve the competences of the electricity program vocational high school teachers.

CONCLUSIONS

Based on the results and the discussions above, the researcher would like to draw the following conclusions:

First, based on the results of validity analysis, the researchers has found that all of the validators state that the vocational high school teachers training model along with the training sets have met the validity criteria and, as a result, the training model might be implemented as the electricity program vocational high school teachers training model.

Second, the results of practicality have been measured in terms of model stage implementation that in overall has met the very good criteria with the mean score that has been equal to 96.15%. As a result, the researcher might conclude that the resulted electricity program vocational high school teachers training model has met the very practical crtieria and might be implemented as the training model for improving the competences of electricity program vocational high school teachers.

Third, the vocational high school teachers training model has met the effective criteria with the following indicators: (a) the level of training participants' knowledge and understanding regarding the training materials has belonged to the high category based on the pre-test and the post-test results; (b) the level of training participants' teaching skills has belonged to the good category based on the peer-teaching activities; (c) the quality of portfolio resulted from the development of learning sets has belonged to the good category; and (d) the training participants' response has been very positive based on the results of the questionnaires that the training participants have completed.

From the achievement of the four effectiveness indicators, the researcher would like to conclude that the vocational high school teachers model that has been developed is effective for improving the competences of electricity program vocational high school teachers.

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