Proceedings of the 2nd Vocational Education International Conference

27th August 2020, Semarang, Indonesia

VEIC 2020

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Preface

We are delighted to introduce the proceedings of the second Vocational Educational International Conference. This conference has brought researchers, developers and practitioners around the world who are eager to advance the vocational education. The theme of VEIC 2020 was "the revitalization of vocational education in Indonesia".

The technical program of VEIC 2020 consisted of 48 full papers, The conference tracks were: Track 1 - Innovation in Building and Developing Vocational Education; Track 2 - Innovation In Preparing and Developing Educators In Vocational Education; Track 3 - Innovation In Preparing and Developing Skilled Workers; and Track 4 - Developing Students Competencies Using E-learning. In addition to the high-quality technical paper presentations, the technical program also featured two keynote speeches, and two invited talk. The two keynote speeches were Prof. Dr. Fathur Rokhman, M. Hum from Universitas Negeri Semarang, Indonesia and Wikan Sakarinto, S.T., M.Sc., Ph.D from Directorate General of Vocational Education, Ministry of Education and Culture, Indonesia. The invited talks were presented by Prof. Jongseok Joseph Ryu, Ph.D from Chung Ang University, South Korea and Assoc. Prof. Dr. Margarita Pavlova, The Director of UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.

It was also a great enjoyment to work with such an outstanding organizing committee team for their efforts in organizing and supporting the conference. In particular, the Technical Program Committee, led by Agung Budi Irawan, Virgiawan Adi Kristianto, and Azzah Balqis Sabbah, who have completed the peer-review process of technical papers and made a high-quality technical program. We are also grateful to all the authors who submitted their papers to the VEIC 2020 conferences.

We strongly believe that VEIC 2020 conference provides a good forum for all researcher, developers, and practitioners to discuss all of the advance in the vocational education. We also expect that the future VEIC conference will be as successful and stimulating, as indicated by the contributions presented in this volume.

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The Evaluation of Teaching Practice Supervisor of the Pedagogic and Professional Competence of The Students during Teaching Practice Program in Vocational Schools in Semarang

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Abstract. Universitas Negeri Semarang is an Institute for Education Workforce Education is expected to produce a professional teacher as human resources in Indonesia. Teachers teaching skills is the basic factor that must be owned by a teacher and always must be improved so that the quality of education that is expected to be achieved. Students who are doing everything Teaching Practice program is not able to control or enforce the competence of teachers well. This study is intended to determine the extent of mastery of professional competence and pedagogical owned by students who are doing Teaching Practice Teaching Practice Program based on Supervisor assessment. This study is a descriptive study, with a sample of 50 respondents conducted in five schools. Data analysis techniques used in this research is descriptive analysis of the percentage. From research conducted data obtained mastery of pedagogic and professional competence of students Teaching Practice Program, with an average percentage of 81% pedagogical competence and the average percentage of 83% of professional competence. Teaching Practice Supervisor stated that Student Teaching Practice Program participants stated to have a good ability to master the indicators pedagogic and professional competence.

Keywords: Evaluation, pedagogic competence, professional competence, Teaching Practice Program

1 Introduction

Teacher teaching skills are a basic factor that must be possessed by a teacher and must always be improved so that the expected quality of education is achieved. Because it is not impossible that teachers are an important factor influencing efforts to improve the quality and quality of education [1]. In addition to that, participant teachers and pre-service teachers have some shortcomings regarding Pedagogical Content Knowledge, pedagogical knowledge, and subject matter knowledge.[2].

Based on government regulation number 19 of 2005 article 28 paragraph 3, it is stated that competence as a learning agent in primary and secondary education and early childhood education includes: (a) pedagogic competence, (b) personality competence, (c) professional competence, and (d) social competence [3]. Pedagogic competence is the ability of a teacher related to the level of understanding of students, the learning process and self-actualization. Personality competence is related to self-understanding, self-acceptance, self-direction and self-
realization. Professional competence is the mastery of broad and deep learning materials, including mastery of curriculum content and the substance of scientific subjects philosophically. Social competence includes the ability to communicate, get along in school and society [4].

One of the main problems of students during Teaching Practice Program is the ability to master teacher competencies. In teaching activities, of course, it involves teachers, students, curriculum, and other driving factors. If one component does not function properly, teaching activities will be disrupted and educational goals will not run optimally [1]. Quality education must be supported by professional teachers to produce people who have strong life skills and self-confidence to become competitors among others in global life [5]. This means that teacher quality is an important component to support the success of educational goals. However good the curriculum and educational facilities are, if the quality of teachers is inadequate, the educational outcomes are not as expected. The requirement to become a teacher, especially a professional teacher, is to know the ins and outs of education and teaching with various other sciences that are fostered and developed through certain educational periods [6].

The Teaching Practice Program is an intracurricular activity such as teaching, creating lesson units, and making guided and independent learning plans to meet the requirements of the educational profession. The Teaching Practice Program will later become a separate lesson for prospective teacher students when they are already working as educators. Practical field experience aims to make students become professional educators who have the knowledge, skills and attitudes that can uphold the achievement of whole pedagogical, professional, social and personality competences. According to Akinde [7] the purpose of field experience practice is to provide a contextual basis for student learning.

Based on observations made by researchers, the main problem is that students who are doing the Teaching Practice Education Program are not all able to master or apply teacher competencies properly, namely pedagogical and professional competencies. This is evidenced by the existence of class disturbances such as commotion in class, the frequent entry of students in and out of class. In addition, there are other problems such as lack of preparation in starting lessons. Teacher performance is a manifestation of teacher competence in teaching and learning in class. Teachers are required to have the ability to teach and play a professional and multifunctional role in creating an effective learning atmosphere. In the use of technology, students lack the knowledge to integrate technology in their teaching and tend to be limited in scope, variety, and depth [8].

However, not all students experience the same thing, there are also some students participating in the Teaching Practice Program who are already fluent in carrying out practical field experiences. From this problem, we want to know the results of the evaluation of the Teaching Practice Supervisor about the extent of mastery of the pedagogical and professional competencies of the Teaching Practice Program participants, because students who will carry out the Teaching Practice Program have already received courses related to pedagogical competences and professional competences.

2 Research Methods

This research is an educational research with percentage descriptive analysis. Descriptive research is research that aims to describe or explain something as it is in the form of a percentage. To collect data in this study, a closed questionnaire was used, which is to distribute it by directly giving a questionnaire to all civil service teachers. The form of the questionnaire
used in this study was a checklist with five answer choices. The data analysis technique used in this study was percentage descriptive analysis. Descriptive percentage analysis is used to determine the percentage of each factor based on the respondent's answer score.

3 Results and Discussion

3.1 Pedagogic Competence

Based on the results of the descriptive percentage analysis, it can be seen that the results of the evaluation of the Teaching Practice Supervisor on the implementation of the Teaching Practice Program at State Vocational High Schools in Semarang for pedagogic competence are good with an average percentage of 81%. These results are cumulative for each indicator in pedagogic competence. More details are presented in the following table.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentase</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helping Students Realize Their Strengths and Weaknesses</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Helping Students Build Trust</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Openness to Students</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Indicator Formulation</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Accuracy of Material and Organizing the Order of the Material</td>
<td>82</td>
<td>81</td>
</tr>
<tr>
<td>Media Use</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Appropriateness of Evaluation Tools</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Ability to develop student potential</td>
<td>79</td>
<td></td>
</tr>
</tbody>
</table>

Based on the results of the analysis of the sub-indicators for students (Helping Students Realize Their Strengths and Weaknesses, Helping Students Build Trust and Openness to Students), it can be said that while running the Teaching Practice Program students are able to understand students. According to the results of the evaluation conducted by the Teaching Practice Supervisor, it can be said that the level of understanding of the Teaching Practice Program participants is 81.67% and is in the good category. The results of this study are in line with the results of Fanani's research [9] which states that students who get a good percentage show that some of the Teaching Practice Supervisors believe in students' abilities in helping students to realize their strengths and weaknesses, foster student self-confidence, foster enthusiasm and interest in students, pay attention to student opinions and suggestions, involve students in the teaching and learning process, and are sensitive to the difficulties experienced by students.

In the learning design indicator with sub-indicator formulation, accuracy of material and organizing the order of the material and media use, it can be said that the evaluation results of the Teaching Practice Supervisor show that the UNNES Teaching Practice Program students have good intentions for these indicators with a value of 81.3%. These results mean that the UNNES Teaching Practice Program students have good skills in learning design. Judging from the percentage score of the Teaching Practice Program students in the formulation of indicators, the use of media, the accuracy of the material and organizing the order of the material that was considered good. According to the results of research, Fanani [9] states that students who get a good percentage show that most of the Teaching Practice Supervisors believe in the ability of students to formulate indicators, accuracy in selecting materials, ability to organize material
sequences, accuracy in selecting methods and using learning media as well as ability in designing learning steps.

The results of the evaluation carried out by 50 Teaching Practice Supervisors for the indicator of the accuracy of the evaluation tools showed 80% results. Among teachers have a good opinion on the accuracy of the evaluation tools used by the UNNES Student Teaching Practice Program. This shows that the Teaching Practice Supervisor believes in the ability of the UNNES Student Teaching Practice Program in evaluating students. This can be seen in the accuracy of students in making evaluation tools that are good in testing students' knowledge of the material that has been submitted and conducting assessments on each posttest and pretest.

On pedagogic abilities with indicators of developing student potential, the results of the evaluation conducted by 50 Teaching Practice Supervisors showed a result of 79%. Teaching Practice Supervisors have a good opinion of students' abilities in developing student potential. This shows that the ability of the Student Teaching Practice Program in developing student potential is considered good by the Teaching Practice Supervisor as well as the role of the Student Teaching Practice Program in improving student achievement.

3.2 Professional Competence

Based on the percentage descriptive analysis, it can be seen that the results of the Teaching Practice Supervisor evaluation on the mastery of professional competence of students participating in the Teaching Practice Program are 81.67% and fall into the good category. The results of this study are in line with it is good. The average percentage obtained from the evaluation results by the Teaching Practice Supervisor is 83%. More details are presented in the table below.

<table>
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<tr>
<th>Indikator</th>
<th>Persentase</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery of the material</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Ability to open lessons</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Asking ability</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Ability to hold a variety of learning</td>
<td>82</td>
<td>83</td>
</tr>
<tr>
<td>Clarity and presentation of the material</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Class management skills</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>The accuracy between the time and the subject matter</td>
<td>86</td>
<td></td>
</tr>
</tbody>
</table>

These results indicate that the Teaching Practice Supervisor believes in the student's ability to master professional competences. This can be seen from the ability of students who are considered capable of mastering indicators in professional competencies such as being able to master material, being able to open lessons, ability to ask questions, being able to make variations in learning, clarity and presentation of material, ability to manage classes, accuracy between times, and subject matter.

Mastery of material for teachers is very decisive, especially in the teaching and learning process that involves subject teachers. The results of the evaluation of the Supervisor Teaching Practice on the student's ability to master the material obtained an average of 80%. This shows that the mastery of Teaching Practice Program student material is good. These results are similar to research conducted by Fanani [9] which states that students participating in the Teaching Practice Program show a good percentage of mastery of the material, which means that most of the Teaching Practice Supervisors believe in the student's ability to master the subject matter. These results are also reinforced by Usman [10] who states that a teacher should always master
the material or subject matter to be delivered and always develop it in the sense of increasing his ability in terms of his knowledge because this will greatly determine student learning outcomes. With sufficient mastery of learning materials, students will be able to teach optimally and if teaching and learning activities are maximized, the learning outcomes obtained are also maximized.

Skills to open lessons are activities and teacher statements that are carried out for the first time in learning activities, carried out with the aim of creating a mentally prepared atmosphere and causing student attention to be focused on the things to be learned. With an average percentage of 82%, it means that the Teaching Practice Program students are able to open lessons well. According to Usman [10] opening activities are not only carried out by the teacher at the beginning of class hours, but also at every piece of activity that is carried out such as starting a question and answer activity or about new concepts.

In the teaching and learning process asking questions plays an important role, because well-structured questions and proper throwing techniques will also have a positive impact on students. Based on the average percentage obtained by 86%, this shows that the Teaching Practice Supervisor believes in the ability of students to ask questions to students, both in terms of the quality of the questions and sentences used. According to research results, Fanani [9] stated that the Teaching Practice Program students were 81.67% and were in the good category. The results of this study are in line with the percentage very well, indicating that most of the Teaching Practice Supervisors are very confident in the ability of students to ask questions to students, both in terms of the quality of the questions and the sentences used. These results are in accordance with the theory presented by Mulyasa [11], namely that questioning skills really need to be mastered by the teacher to create effective and fun learning, because almost in every stage of learning the teacher is required to ask questions, and the quality of the questions asked by the teacher will determine the quality of the students' answers.

Holding variations is a skill that teachers must master in learning, to overcome the boredom of students, so that they are always enthusiastic, diligent, and full of participation. Variations in learning are changes in the process of activities aimed at increasing students' motivation to learn, and reducing boredom and boredom [11]. According to the Teaching Practice Supervisor, the ability of students to make variations is good with an average ability to vary by 82%. This means that some of the Teaching Practice Supervisors believe in the ability of students to carry out variations in learning, both in terms of material delivery, using and applying learning methods. This condition is in line with the results of research by Fanani [9] saying that the Teaching Practice Program students fall into the good category. With these results, it means that the Teaching Practice Supervisor is very confident in the ability of students to make variations both in terms of material delivery, use of methods and in the use of learning media. This ability is also strengthened by Slameto's statement [12] which states that teachers must use many methods in teaching. Variations in methods will result in the presentation of learning materials to attract the attention of students and the class to be more lively, the method of presentation which is always the same will bore students.

Explaining is an important aspect that teachers must have, considering that most learning requires teachers to provide explanations. In addition, so that the explanation given can be understood, the presentation of the material must be good, coherent, and easy to understand. The results of the analysis show that the student's ability to explain and present the material is good, this is indicated by the mean value for this ability of 83% and this condition shows that the Teaching Practice Supervisor is fully confident in the ability of the Teaching Practice
Program students in clarity and presentation of the material. This is in line with the results of a similar research conducted by Fanani [9], which stated that the Teaching Practice Program students showed good results in the clarity and presentation of the material. The results of this study are also reinforced by the opinion expressed by Usman [10] which states that providing information is a very important aspect of teacher activities in their interactions with students in class, so the delivery of information must be good and presented in a suitable order.

The ability to manage the classroom is the teacher's ability to design, organize and organize the curriculum, translate it into teaching procedures and learning resources, and organize the learning environment to achieve an effective and efficient teaching atmosphere. The result of the evaluation of the Teaching Practice Supervisor on the students' ability in the Teaching Practice Program was 82% with good criteria. This shows that the Teaching Practice Supervisor is very confident in the ability of the Teaching Practice Program students in managing the class. This can be seen from the way students are able to open and close lessons well, besides that students are able to create a conducive learning environment by arranging classroom layouts for teaching and creating a suitable teaching and learning climate so that students can study calmly and comfortably. The results of a similar study conducted by Fanani [9] also stated that the Teaching Practice Program students showed a very good percentage of class management skills, this shows that most of the Teaching Practice Supervisors are very confident in the student's ability to manage the class. These results are also reinforced by the opinion of Usman [10] which states that the quality and quantity of students in the classroom depends on many factors, including: teachers, personal relationships between students in the classroom, and general conditions and atmosphere in the classroom.

The result of the evaluation of the Teaching Practice Supervisor on the ability in accuracy between the time and material of the Teaching Practice Program students was 86% and it was in the good category. This shows that the Teaching Practice Supervisor believes in the ability of the Teaching Practice Program students in the accuracy between time and material. These results are similar to the results of research conducted by Fanani [9] where in the study the Teaching Practice Supervisor stated that the Teaching Practice Program students were able to adjust the material to the time.

4 Conclusion

Based on the results of the research, it can be concluded that the mastery of the students' competency in the Field Experience Practice is as follows:

1. The results of the evaluation of the Teaching Practice Supervisor on the pedagogical competence mastery of the students of the Semarang State University Teaching Practice Program are good with an average percentage of 81%.

2. The results of the evaluation of the Teaching Practice Supervisor on the mastery of the professional competence of the Semarang State University Teaching Practice Program students are good with an average percentage of 83%.

References

The Health Behavior of Students at Home Economics Program during Covid-19 Pandemic Era

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Abstract. One of the basic applications of health behavior for every individual is the knowledge that they have. The knowledge can be obtained through education, both formal, non-formal and informal education. Healthy lifestyle is a practice of clean and healthy habits in daily life both at home and outdoors. Most of students at UNNES especially Home Economics study program live in boarding houses, but during the pandemic most of the students returned to their homes. Family and environmental health is one of the courses in the Home Economics program which is expected to be the basis for the application of health behavior for students. This ex-post-facto research aims to explain about the health behavior of the students during the pandemics of covid-19. The population of the study is the all students at the Home Economics program, Universitas Negeri Semarang. 89 students were sampled in this research. Those who were sampled have taken family and the environmental health. The results showed that students of Home Economics program implementing health behavior in the category of “high” with the percentage of 36% (32 people), the category “moderate” by 64% (57 people), and there are no students in the category of “low”. Based on the results, it is recommended that the students of Home Economics program of UNNES continue to improve the implementation of health behavior, at home and the outside.

Keywords: health behavior, Home Economics program students, Covid-19 pandemic

1 Background

Healthy lifestyle is a practice of clean and healthy habit in the daily life for the students during both in class or at the outside (Kusrianto, 2004). Healthy lifestyle is an attempt to empower household members in being aware of, as well as engaging in health behavior (Suratmo and Rismiati, 2001). Health behavior is a response to a person's health (organisms) to stimulus associated with pain and diseases of the health care system, food and the environment. The Ministry of Health argued only 20 percent of Indonesia's total population understood a healthy lifestyle; while the number of various diseases and health threats, such as stunting to obesity, continue to increase (Deonisia Arlinta in Kompas, 20-09- 2019). Mohammed JM
Shabat's (2015) research describes that the health behavior of students at the medical school is in the good category with 49%, and the poor category 51%. While health behavior of the nursing students of Medical School at Udayana University, Denpasar is in the poor category (Made Rini et al, 2016). Most of the students, either immigrants or stay at home, usually do not really concern about the health, because their business during class. Therefore, their attention to their own health is second to finishing the task, or the activities of the organization. In addition, they have financial reasons to avoid the healthy lifestyle. 80 % of the students at Home Economics program are from out of town; they live in boarding houses. The family and the environment health course is one of the courses taken by students at the Home Economics. Therefore, it is expected to be the basis for the implementation of health behavior both when staying at the boarding house and at home. Based on the background above, the research problem is formulated as follows: how is the level of health behavior of the students at Home Economics program during the covid-19 pandemic? The results of this study are expected to contribute in providing information about the health behavior of students during the Covid – 19 pandemic; as well as the development of the learning material at Home Economics program. Both contributions illustrate the urgency of the attitudes and behaviors that promote health behavior as the basis to perform students’ activities. Therefore, the health behavior leads to students who are intelligent, have stronger character both in the perspective of normative and paradigmatic.

2 Method

Research Design, this ex-post-facto research is aimed at describing the health behavior of the students at Home Economics program, Unnes during the Covid – 19 pandemics. The population of this research is all students at Home Economics program, Universitas Negeri Semarang, through the purposive random sampling, 89 students were sampled in this research. Those who are sampled in this research have taken Family and Environment Health. Data Collection Instruments, A questionnaire consisting of 14 statements of seven indicators was used to measure the health behavior. Each statement has five alternative choices of the response action. The indicators of the questionnaire are as follows: 1) 2 items for the exercise indicator; 2) 2 items for the consumption of fruit and vegetables indicator; 3) 2 items for reduction of staying up late indicator; 4) 2 items for the consumption of water indicator, 5) 2 items for the consumption of nutritionally balanced menu indicator; 6) 2 items for the capacity of stress management; 7) 2 items for maintaining the cleanliness of the environment indicator. The choices of each item are as follows: "always" = 5, "mostly" = 4, "sometimes" = 3, "rarely" = 2, "never" = 1. The validity and reliability of instruments were tested at 30 students out of the sample by using exploratory factors analysis. KMO Value for the Measure of sampling adequacy (MSA) = 0.678 or > 0.05 which means that the sample is adequate for this research, the value of KMO and Bartlet's test (chi-square) = 194.530 with the probability value = 0.000, it indicated the correlation between the variables. The MSA value of each item > 0.05. This value indicates that all items are valid. Cronbach’s Alpha value = 0.582, the reliability of the instrument is included into moderate category. The normality tests were conducted by sung Liliefsors (sig. = 0.045) and Shapiro - Wilk tests (sig. = 0.005), both indicate that the data were normally distributed with the probability value less than 0.05 (0.045> 0.05; 0.005 <0.05). Data Analysis Categorization data was performed by using with these following criteria: 1) X < [μ-
1.0 \sigma] \text{ [low category] } ; 2) [\mu - 1.0 \sigma] \leq X < [\mu + 1.0 \sigma] \text{ [average category] } ; 3) [\mu + 1.0 \sigma] \leq X \text{ [high category] }. Description : X = score , \mu = mean value , \sigma = standard deviation. While the percentage in each category is calculated by the formula: NP = \left[ \frac{R}{SR} \times 100\% \right] \times \text{[SR]}^{-1}. Description of the formula: NP = the expected of percentage value; R = the number of the respondents at the specified category; SR = overall respondents; 100 = a constant. [Azwar, 2012].

3 Finding

The results of the data analysis can be seen follows:

<table>
<thead>
<tr>
<th>Classification</th>
<th>frequency</th>
<th>percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>average</td>
<td>57</td>
<td>64.0</td>
<td>64.0</td>
<td>64.0</td>
</tr>
<tr>
<td>High</td>
<td>32</td>
<td>36.0</td>
<td>36.0</td>
<td>100</td>
</tr>
<tr>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>100.0</td>
<td>100.0</td>
<td>-</td>
</tr>
</tbody>
</table>

Based on the results on the table and the diagram above, it can be explained that, the students of Home Economics program implementing health behavior are in the category of "high" at 36% (32 people), then 64% (57 people) of the students are in "Moderate" category, and there are not students at the Home Economics program are in the "low" category.

DISCUSS

Healthy lifestyle as an effort to keep one's body healthy, which can be done by eating nutritious food, exercising regularly, and getting enough rest. Most people consider that healthy lifestyle is difficult lifestyle to live because it is financially expensive. Health is something that is coveted by every individual regardless of age, gender and social status. Inner and outer wealth becomes meaningless when we are stuck on illness or pain. The concept of "healthy" according to WHO is formulated in a very broad scope, that "a state of perfect physical, mental and social, not just the absence of disease or infirmity / disability". In this definition, health is not just free from disease or disability. People who are not sick are not necessarily considered to be healthy, they should be healthy in the sense of perfect condition physically, mentally, and socially. The definition of health by the WHO is an ideal circumstance based on the perspective biology, psychology and, social and so one can perform activities optimally. The healthy definition
proposed by WHO contains 3 characteristics: 1) Reflecting attention on individuals as humans; 2) defining health in the context of internal and external environment; 3) Health is defined as a creative and productive life. Health is not a condition but an adjustment, and is not a condition but a process, and what is meant by the process here is the adaptation of individuals who are not only to their physical but to their social environment. According to WHO, there are three important components that constitute a definition of health: 1. Physical Health, an important component in the sense of being completely healthy, in the form of a human figure who has healthy skin, shining eyes, neatly combed hair, neatly dressed, muscular, not fat, fresh breath, good appetite, sleep soundly, agile and all physiological functions of the body run normally; 2. Mental Health, mental and physical health is always interconnected as in the old saying “a healthy soul resides in a healthy body” (Men Sana In corpore Sano); 3. Spiritual health, is an additional component to the definition of health by WHO and has an important meaning in people's daily lives. Every individual needs to get formal and informal education, the opportunity to take a vacation, listen to music and songs, spiritual education such as religious lectures and others so that a dynamic and not monotonous soul balance occurs. Therefore, it can be concluded that the definition of health according to the WHO includes physical, mental, and social (Chandra Budiman. 2006)

Behavior of students in the current era tends to ignore healthy lifestyles, especially for adequate nutrition, because most students consume fast food without vegetables, as well as types of drinks that are more concerned with aroma and taste without considering nutrient content. Most students are often less able to manage their time because they assume that the assignments from the class is their burdens that they need to finish and it takes time from the afternoon until the evening incessantly. They also have many additional activities, it can make students lazy to take care of themselves. Starting from irregular eating patterns, lack of time to exercise, eating unhealthy foods, and lack of rest. Most of the students, either immigrants or stay at home, pay less attention to their health (Made Rini et al, 2016). As a result, the body that should be fit, can be easily attacked by various diseases. To avoid unwanted diseases, students must pay attention to the importance of health behavior at a young age. Here are ways that can be used as a reference relating to regulating lifestyles to stay healthy. The seven points of a healthy lifestyle for students who make indicators of a healthy lifestyle refer to Rafani AS, (2020) (http://tipsjalanhidup.blogspot.co.id/2015/03/tips-sehat-untuk-mahasiswa.html), as follows: 1) make time for a light exercise such as running, push up 10-20 times, or just loosen muscles everyday. That will be very meaningful for the body or take minimal exercise at least 2-3 hours of walking in the morning because with moderate exercise is enough to prevent the body from heart disease, stroke, diabetes and osteoporosis. If you have more time, choose the right and healthy activities, one of them is by exercising, such as jogging, swimming, healthy walking, aerobics, recreational sports; during the Covid-19 pandemic, most student still do not take the time to exercise. It is predicted because students' daily activities were almost completely at home. 2), Consuming vegetables and fruit, the immune system must be maintained to prevent various diseases. Vegetables contain antioxidants that must be consumed. Most students, especially those who live in boarding houses tend to always consume instant foods such as noodles, perhaps many do not understand the danger of instant foods. To return to a healthy lifestyle, it is necessary to reduce instant foods, and consume lots of fruits and vegetables. Fruits do not have to be expensive, there are bananas, oranges, mangoes and many more, as well as vegetables such as spinach, kale, long beans, and the like. Consuming fruit should be before eating, so that the benefits of the fruit itself can be felt more; Health behavior of students in consuming nutritious food on average is good, it is assumed because during the Covid-19 pandemic, students actually live at home, so that they can consume
nutritious foods, especially fruits and vegetables. 3) reducing the time to stay up all night; staying up late is mostly done by students who have not been able to manage time. Students must be good at managing time to avoid staying up late, because it takes up our time to rest and consume more energy in our bodies. When we stay up all night we will feel hungry, then the students tend to choose instant food as a solution, such actions become unhealthy if consumed too often; Most students are in the moderate category of time management for taking a rest, it is assumed that during Covid – 19 pandemic, many assignments must be completed because all lectures go online as well as the implementation of mid-term and final exam. Furthermore, 4) drink plenty of water, our bodies need very much water intake, most students prefer to drink colorful, flavorful and contain lots of artificial sweeteners, not all types of drinks we drink will be useful for our health, it is recommended to start increasing intake of water consumed every day that is 2-3 liters every day; Health behavior of students in consuming water every day on average is good, it is assumed because at home they always provide water and in the pandemic season many students stay at home. 5) eat sufficiently, meaning that it does not limit the portion of food, but choose foods that are nutritious and healthy. The food does not have to be fancy, but it must still maintain the nutritionally – balanced food; According to nutritionist Dr. Lanny Dewi, SPGK, things that must be considered in a diet are the amount of food, type of food, and meal schedule. Ideally the amount of food must be the same as the energy produced by the body. The indicator of eating in moderation is in moderate category, it is assumed because there are many activities at home, so that their appetite increases, and often consumes foods that are not actually needed by the body. 6) stress management, for example, many assignment, poor time management, romance issues, lack of financial, family issues, can lead to stress. To cope with stress, try to do some fun activities. Relax and do positive things that can channel your hobby. Get together with friends of the same type, listen to fun and funny stories that can make us laugh. Stress management is required in dealing with the problems we face so that we can live better; Most students are still in the moderate category of stress management, it is assumed that during the Covid – 19 pandemic, communication with friends is not good and there are class assignments can lead to psychological pressure. 7) keeping the cleanliness and neatness of the environment, learning in a clean and tidy condition is much more comfortable than in a dirty and disorganized condition. Cleanliness is not only benefit themselves, but also benefit people around us. Neatness can improve our mood for enthusiasm for learning and remain optimal in maintaining health; the indicator of maintaining the cleanliness is in moderate category. It is assumed that the students’ routine of doing daily activities at home, so they have time to clean and tidy up the house and its environment. It is suggested by Dr. Reni Utari (April, 2020) www, Sehatq.com, some things that need to be done during the Covid-19 pandemic are: Get enough sleep, consume healthy food, consume multi vitamins, control stress, exercise, sunbathe, stay away unhealthy food.

4 Conclusion and Suggestion

Conclusions: the health behavior of students at Home Economics program are as follows, in there were 32 students or 36% in the high category, 64% or 57 students are in the moderate category and no students are in the low category. Based on these results, the suggestion given to all students in general and at Home Economics program in particular, is to improve the implementation of health behavior both at home and at the outside.
References

Optimizing the Skills of Clothing Design Teachers and Students in Clothing Design Using the CorelDraw and Adobe Illustrator Programs to Respond to Industry 4.0

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Abstract. The creation of technology-based fashion design is a necessity for the effectiveness of learning curriculum for Clothing and Industry 4.0 Vocational Schools, the provision of skills to students is a necessity. Fashion Design which includes the design of body proportions, fashion parts and shapes, sketches by the concept of collages, Adobe Illustrator design offerings, fashion Illustration, sketching designs, and designs production. The Adobe Illustrator CorelDraw program is strategic so that it is relevant to respond to community service activities to develop computer technology-based education because it contributes positively to the skills of fashion education students. A very fundamental problem is the lack of students in innovating in the teaching and learning process based on computer programs. The result of this dedication is the ability of fashion design education department students PKK FT UNNES in creating fashion designs based on the Adobe Illustrator CorelDraw program so that they are able to develop and utilize science and technology for the creation of fashion designs, giving new insights about creating fashion designs with the CorelDraw program and Adobe Illustrator among students so that it attracts a love of fashion design, while at the same time orienting towards regenerating the development of fashion designs in other wider communities, this service is also oriented towards producing scientific articles, copyrights, and reports. To achieve these objectives, this service includes activities such as: literature study, observation, training, workshops, documentation, understanding fashion design with CorelDraw and Adobe Illustrator to students including: the embodiment process, creating fashion designs with CorelDraw Adobe Illustrator data; creating fashion design tutorials using CorelDraw and Adobe Illustrator, registering copyrights; compile report. Disseminating to designers at the Fashion Vocational Schools, result designers, and related institutions; compiling reference books, scientific articles, international journals, copyrights, tutorial books, and reports.

Keywords: Creation of fashion design, CorelDRAW, Adobe Illustrator, industry 4.0

1 Introduction

Fashion design is very fundamental to the development of fashion itself. Clothing can be said to have quality, philosophical, and economic value because the design elements are very dominant and affect consumers or observers of fashion. The purpose of using a computer as a tool is to simplify work, accelerate the need for information systems, and provide convenience in creating fashion designs by utilizing available computer software.
The development of fashion designs from various regions has characteristics that highlight the potential in the area. The weakness of some areas is the difficulty in developing existing designs including the academic community. Learning still looks monotonous with various manual techniques and there is no visible digital touch in creating a design. Based on observations made, the weakness of some students is the visual processing that is less attractive and does not utilize existing technology. At least students of fashion design due to lack of experts so that it affects the new fashion design designers utilizing software to process and create relatively few fashion designs. Fashion designers as one of the main actors of fashion companies, in general, have not maximized the existing technology in creating designs. Innovations and creations of fashion designers in the form of fashion designs need to be inventoried by storing existing works to make time and energy-efficient.

Clothing design activities that are generally done manually on paper media can now be done using computers using various software for drawing such as CorelDraw and Adobe Illustrator Macromedia Freehand, Paint, Adobe Photoshop, and AnSeries. CorelDraw and Adobe Illustrator tracing (broken colors) in the textile printing industry can also be used for the design process (textiles). CorelDraw and Adobe Illustrator have advantages in the process of making designs and tracing easily and are instant nature made specifically for fashion design. This software is expected to reduce the burden both in cost and energy in a fairly simple way. Processing fashion design drawings is very helpful for processing these images and will obtain a fashion design. Students are able to process ideas and creativity through this software. It is expected that the method of creating fashion designs using CorelDraw and Adobe Illustrator is part of efforts to strengthen the national innovation system considering the fashion industry is synonymous with national interests because the above problems are also dominantly experienced by the academic community, vocational students, crafters, and fashion industry players in the region Indonesia. Therefore, based on the above problems the objectives of this research are: (1) Can produce a unique, creative design based on CorelDraw and Adobe Illustrator programs that can provide competitive advantages amidst the many designers in the present and the future; (2) Improve the ability to respond to computer programs to design. With the fashion design using CorelDraw and Adobe Illustrator which, besides being practical, unique, creative, innovative, and varied, can also improve the ability of teachers and students in designing with Adobe Illustrator program.

2 Methods

This research is a type of experimental research. The sample in this study were 5 Vocational High School Dressmaking teachers and 25 Clothing Design students at the UNNES Faculty of Engineering. The research process is carried out with the following procedures: (1) The community service program begins with the socialization of identification and mapping of targets according to program needs theoretically and methodologically. (2) Establishing solutions that can be explained scientifically in relation to priority issues agreed with the community, or identifying asset-agents in the socio-cultural process of the community. The first thing that was carried out in this series of services was to provide understanding to the Fashion Vocational School teachers in the city of Semarang and the students of fashion education study programs. Conduct training for Semarang City Vocational School teachers and PKK students Fashion Design department, UNNES, considering that the Adobe Illustrator program has been included in fashion design courses in SMK Fashion Clothing. After understanding the
participants, the next thing is practice with competent presenters, then it is applied to teaching the students, and for students is the provision that must be had when they have graduated and entered the community.

3 Results

Corel Draw program is often used to do jobs such as creating a logo or symbol design, used by its users, especially in making two-dimensional logos because of its ease in processing lines and colors. Adobe Illustrator was chosen because the work of illustration is very powerful and lightweight so it makes the process of making images with digital devices easier than other programs. Full features, such as the screen palette in Adobe Photoshop that graphic designers often use to coordinate screens and the hardware requirements used are not high in installing Adobe Illustrator programs. In addition, the resulting color quality is very good, the color output on the monitor with printouts is almost the same.

Adobe Illustrator is a vector-based image processing software or graphic design program. Vector itself is a collection of points and lines that are connected which is a combination of colors to form a drawing object created by Adobe Systems that uses vectors (Yoga, 2005: 1). As a vector illustration program, Adobe Illustrator is a reliable software to realize the creativity and imagination of a designer in the form of images. This program is highly recommended for use by graphic design circles. Various conveniences in making graphic works can be realized with the help of tools and simple interfaces (Hendratman, 2018: 21). Adobe Illustrator was created in 1986 and is designed to work with Macintosh computers. The company does not have a large percentage of the market, and the only software tool that is able to challenge Adobe Illustrator is Laser Writer, a tool produced by Apple. Adobe Illustrator is a powerful tool that has a low learning curve. Despite this, it is famous for its level of precision. Many people have found Adobe Illustrator to be a useful alternative to complex design tools such as AutoCad.

The first advantages of Adobe Illustrator are, this application has advantages in terms of its nature that is integrated with many Adobe products in one unit called Adobe Creative Suite. This means, some Adobe Illustrator features are integrated with features in other Adobe applications, flexible in various other Adobe applications such as Adobe Photoshop, Adobe Lightroom, Adobe After Effects, Adobe Bridge, and various other Adobe products. Furthermore, one of the most prominent uses in AI software is making illustrations, but also the drop shadows that it provides are quite good and neat, so they are able to create illustration designs, fashion designs and cartoons that look more leverage. This graphic design application is capable of handling large RAW files. Print out feature produced by this graphics software is arguably very good, similar to one of the advantages and disadvantages of Corel Draw. In addition, this graphics software is able to print images that have high resolution without worrying about losing image resolution when the print out process occurs. AI also supports export to vector format with a good and accurate SVG (Scalable Vector Graphic) format. This means you can do graphical conversions made using this AI to SVG format directly from the AI application. Please note that there are differences in bitmaps and vectors.

Fashion design training using Adobe Illustrator at the Fashion Vocational School teachers in Semarang, and PKK FT UNNES fashion students, in order to respond to the curriculum at Fashion Design Vocational School as well as adding skills in designing with the coreldraw and Adobe Illustrator program. In the development of science, technology and art, it is a necessity that we respond by learning technology that supports the process of work, namely designing
clothes with the program. Without setting aside the ability of the skills manually to sketch and design the corelraw and Adobe Illustrator fashion program is an effort for present and future generations where technology is inevitable for easy and dynamic creative processes. For this reason, increasing the ability of students needs to be encouraged with the right method, directed and focused.

4 Conclusions

Fashion design training using CorelDraw and adobe illustrator for the teachers of the Fashion Design Vocational School in the city of Semarang, and the Fashion Design students of the Department of Home Economic FT UNNES to respond to the curriculum at the Fashion Design Vocational School as well as add skills in designing with the CorelDraw and Adobe Illustrator program. In the development of science, technology and art, it is inevitable that we respond by studying technology that supports the process of creating, namely designing clothes with the program.

References


Appendix

Figure 1. The atmosphere of design training with Corel Draw
Figure 2. Submitting coreldraw material to participants

Figure 3. Example of the results of the Adobe Illustrator material by participants
Figure 4. Example of the results of the Adobe Illustrator material by participants

Figure 5. Example of the results of the Adobe Illustrator material by participants
Development of Soft Skills for Vocational Students Based on Pesantran

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Abstract. Education is an attempt to form a good body and soul personality. Not only mastering science and technology. But also the important thing is knowledge and recognition of the students themselves. Many people are busy with competition but forget about their identity, with religious teachings. Emphasis on soft skills is important by introducing students' identities. In terms of student character, there are aspects that need to be developed, specifically soft skills. Soft skills are an important aspect of student academic success and at work. This study describes the soft skills that need to be developed for vocational school-based students. Based on data collected 100% respondents argued that hard work is very important to be developed in students. Apart from that, other characters include honesty, discipline, sociability, hard work, love of work, leadership, competitive, regular life, and the ability to sell ideas.

Keywords: soft skills, vocational students, pesantren.

1 Introduction

Character education which is arranged systematically will have a positive effect on academic achievement [1]. Education is one of the factors that determine and influence social change. Through education, it is hoped that it can produce the next generation with strong character to accept the baton of the nation's leadership [2].

To produce the next generation with strong character, proper character education is needed. Proper character education will produce strong human resources in dealing with various problems.

In industry, psychology plays a major role in the human resource division (HRD). HRD is a part that focuses on human resources as the core element driving the organization. This section is tasked with ensuring that human resources in the company are the right people to perform tasks in order to achieve organizational goals [3].

An organization consists of people and its success depends mainly on the capabilities of its human resources. Human capital then becomes a fundamental component for every company. The quality of human resources greatly affects the results that can be achieved by the company. This occurs in both service and manufacturing companies and others.
terms of methodology, systems, facilities, components etc. and trying to select workers who are technically prepared and able to perform the tasks they are employed [4]

Variations of research disciplines such as Psychology, Education, Management, Human Resources Information Systems have studied the concept of competence. Various researchers have provided different definitions over the years and have caused ongoing debate [5]. In today's world of education, competence is needed, especially in measuring the output and results of the learning process. In the sense that competence is considered as a key word in education today [6]. Competence as a basic characteristic of a person, which results in effective performance and excellence in work [7] [8].

To develop human resources, one of them is vocational students. Vocational students are human resource assets that must be trained and given education in order to have good character. Character is a skill for students. Character can also be associated with a competency that vocational students need to have. Student competencies consist of had skills and soft skills. Hard skills relate to one's technical abilities. Meanwhile, soft skills are related to a person's self-management, interpersonal and self-ability to respond to everything that happens to him and his environment.

Pesantren in Indonesia have been Muslim educational institutions since the sixteenth century. A pesantren in contemporary Indonesia usually consists of a pondok (boarding house) and a school during the day. Pesantren are very shaping environments for children and adolescents. Whereas learning in madrasah students spend two thirds of each day in a dormitory environment (Pondok Pesantren) [9]. Currently, pesantren are also establishing schools by equipping their students with skills, namely pesantren-based vocational schools.

In vocational schools based on Pesantren, students generally live in dormitories (Pondok Pesantren) for religious schools and vocational schools. Students learn general knowledge and skills from 07.00 to 14.00, and the rest study religion and various activities at the Pondok.

Based on interviews with several Pondok Pesantren caregivers, 40% of vocational school graduates go on to college, 40% to industry, 10% entrepreneurship, 10% want to be unemployed or do not work for 1 year. This phenomenon is certainly a new problem in vocational education. That vocational school graduates are not accepted to work in industry but with their personal desires not to work.

This article aims to describe the importance of developing soft skills in vocational students based on Pesantren.

2 Methods

This research is quantitative descriptive. The data collected used interviews with teachers and principals in vocational schools based on pesantren. The data analysis used descriptive analysis to describe the soft skill emphasis on vocational students based on Pesantren (Islamic boarding schools).

3 Results

Based on the results of the interview, the difference in subjects in the Islamic boarding school-based vocational school curriculum is the Culture of the Islamic Boarding School (Pesantren Culture), this culture includes the study of figh, the Qur'an and hadith, the Arabic language, hafidz (memorizing the Qur'an). In general, what distinguishes regular
vocational schools from vocational schools based on Pesantren is the application of 30-40% character, 40% productive, and 20% adaptive.

In the implementation of learning, several schools apply that all students live in the dormitory and some do not. In vocational schools that do not require students to board, around 20% of those who live in boarding houses come from outside the city.

Based on data collected from 17 vocational schools based on student softskill pesantren that need to be developed, namely honesty, discipline, sociability, hard work, love of work, leadership, competitive personality, regular life, and the ability to sell ideas. The importance of soft skills that need to be developed for vocational students based on Pesantren is shown in Figure 1.

![Diagram showing soft skills importance](image)

**Fig. 1.** The percentage of soft skills that need to be developed for vocational students based on Pesantren

Based on research, 94.1% of respondents think that honesty is very important to be developed and 5.9% think it is important to be supported by Islamic religious education subjects and Pancasila and Civil Education (PPKN).

As many as 82.4% thought that discipline is very important for character development and 17.6% thought that an important disciplinary attitude needed to be developed with the support of practical workshop subjects, PPKN, religious education, extracurricular activities.

As many as 58.8% thought that sociability is very important and 41.2% thought it was important to be developed, supported by entrepreneurship, PPKN and extracurricular subjects in schools. Students are also required to have a hard working character. 100% of respondents assume that the character of hard work is very important in the process of developing student character. With the support of practical workshop / subject of expertise.
In carrying out an activity, activity, or student assignment also requires a character who loves his job first. Because loving the work we live for will maximize the results later. as many as 70.6% of respondents thought that the character of loving work was very important and 29.4% thought that the character of loving work was important to be developed, supported by entrepreneurial subjects, productive / subject of expertise.

Having a leadership spirit is also able to develop the character of vocational school students, as many as 70.6% of respondents think leadership character is very important, 23.5% think it is important, and 5.9% think leadership character is quite important to be developed supported by practical subjects, Student Organization Inside School (OSIS), and extracurricular (scout).

As many as 70.6% of teachers thought that competitive personality traits were very important to be developed and 23.5% percent thought it was important to be developed by being supported by entrepreneurial and productive activities or subjects.

Regular life is also needed in developing character, as many as 88.2% of respondents thought that organized life was very important and 11.8% thought it was important to develop students' character. Supported by religious and productive / subject of expertise. 2.9% of respondents thought the ability to sell ideas was very important in developing character and 47.1% thought it was important, supported by entrepreneurial and creative productive subjects.

Education is an effort to form a good body and soul personality. Not only mastering science and technology. But also the important thing is knowledge and recognition of the students themselves. Many people are busy with competition but forget about their identity, with religious teachings. Emphasis on soft skills is important by introducing students' identities. With the existence of a vocational school based on Pesantren, students not only have knowledge of technology but are equipped with religious knowledge which actually leads to better change. With the provision of religion, science and technology students tend to have innovation, independent spirit, and compete with others. Because in the teachings of Islam, everything will be accounted for during his lifetime. Of course, if students are aware of this, there will be no more students who want to be unemployed when they graduate from school, and try to work well.

4 Conclusions

Education is an effort to form a good body and soul personality. Not only mastering science and technology. But also the important thing is knowledge and recognition of the students themselves. Many people are busy with competition but forget about their identity, with religious teachings. Emphasis on soft skills is important by introducing students' identities. With the existence of a vocational school based on Pesantren, students not only have knowledge of technology but are equipped with religious knowledge which actually leads to better change.

Based on data collected 100% respondents argued that hard work is very important to be developed in students. Apart from that, other characters include honesty, discipline, sociability, hard work, love of work, leadership, competitive, regular life, and the ability to sell ideas.
References


The Development of Learning Media for Automotive Electronics (Autotronics) Simulator Based on Measurement of Sensor Output Performance

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Abstract. The purpose of this research is to develop a learning media for automotive electronics system simulator based on measurement of sensor output performance using a microcontroller. This research was conducted with the Research and Development method using Plomp model which has stages: (1) preliminary investigation, (2) design and prototyping, and (3) assessments. The sensor to be simulated is sensor on the Electronic Fuel Injection (EFI) system, that is Manifold Absolute Pressure (MAP) Sensor. Microcontroller is used to process the sensor output and provide information numerically and graphically. The instrument used was questionnaire sheet for media experts and subject experts and a simulator test observation sheet. The results of the study were product of MAP for automotive electronics system simulators. Media and material expert testing results in an assessment that the simulator is in the very valid category. While testing the results of observations testing the product shows the simulator can display sensor characteristics in the form of tables and graphs.

Keywords: simulator, automotive electronics, sensor performance

1 Introduction

The development of automotive technology has involved the use of massive electronic control systems. If in the past the system of the vehicle worked mechanically and hydraulically, now it uses an electronic system. For example is a fuel system that originally used carburetor technology, now it uses an electronically controlled injection system (Electronic Fuel Injection). The fuel system is designed to provide a mixture of air and fuel according to engine requirements. Fuel requirements in the carburetor system are determined by the amount of vacuum in the carburetor venturi area. Very varied engine conditions result in carburetors needing to be equipped with many systems to be able to adjust engine requirements such as low speed, high speed, power system, acceleration system, and others. The disadvantage is that the ratio of air and fuel mixture cannot be accurately adjusted to the stoichiometric ratio of fuel air mixture. The impact is increased fuel consumption and exhaust gas has high levels of gross emissions. The EFI system was developed to ensure that the ratio of air and fuel always approaches the ratio of the ideal fuel air mixture by detecting any changes in engine conditions through the measurement of parameters that affect. Among these are the amount of intake air, intake air temperature, coolant temperature, throttle valve opening, engine rotation speed. The equipment that detects this is called a sensor.
Sensors detect physical, chemical quantities and convert them into electrical quantities to be sent to a data processing device (processor/control unit). Quantities such as temperature, speed, flow, intensity of light are converted into electrical signals to be more easily processed and compared to a specified reference value. The amount of error (error) is used by the processor to make a decision and give an action signal to the actuator. In the EFI context, the action signal is manifested in the action of spraying fuel by the injector. Other automotive electronic systems such as the Antilock Braking System (ABS), VVTI (Variable Valve Timing) system, Electronic Power Steering (EPS) system, Common Rail Diesel Injection and many other autotronics systems work in the same way. The sensor detects related parameters, sends a signal to the processor and the processor processes it to provide an action signal to the actuator.

Electronic control systems learning all this time begins with an explanation of the concept of control systems and the workings of sensors, processors and actuators. The other learning activity is project based where a group of students designs and realizes the application of an electronic control system into prototype unit. One of prototypes that have been produced is Auto Wiper System which is a windshield wiper system that automatically regulates the speed of cleaning the windshield according to the intensity of the rain. The sensor used to detect rainfall is a water sensor. Examples of other systems that have been made is prototype of automated parking system. This system detects the conditions around the vehicle and sends a distance signal so that the driver can make decisions so that parking becomes easier. The sensors used are infrared sensors and ultrasonic wave sensors. This method of learning has advantages and disadvantages.

The advantage is that students are able to master the concept of an electronic control system and create it in the form of prototypes that are likened to real autotronic system. The drawback is that students do not apply the concept of electronic control systems directly to vehicles. Thus the sensors and actuators used in prototypes are not sensors and actuators that are used in real vehicles.

Another form of learning is to use real vehicle engines and students use scanners and oscilloscopes to get an overview of the work of electronic control systems. The advantage of using this media is that students can directly use real actuator sensors on vehicles. The drawback is the procurement of equipment costs such as scanners and oscilloscopes that are not cheap. The scanner also needs to be updated routinely in accordance with the latest vehicle brand developments. Another weakness during the use of scanners and oscilloscopes is that in measuring the performance of the sensor output it has not been able to see the relationship of the sensor input with its output graphically. Input is still realtime and cannot be conditioned. With the use of simulators, this deficiency can be overcome.

Electronic control system simulators need to be developed in order to demonstrate the real conditions of the input being varied. For example the water temperature sensor on the EFI system is used to detect the engine coolant water temperature. The simulator can demonstrate when the cooling water is still cold, it will read the temperature and output resistance and sensor voltage. When the temperature rises, the resistance output and the sensor voltage will change in value. And so on until the maximum working temperature is reached. The simulator will be able to record data for changes in input and output. These values are processed by a microcontroller in the simulator so that they can be tabulated and presented in a graph.

Therefore, it is necessary to use an automated system simulator based on measuring sensor output performance which can show changes in the sensor output of the input and graphically read the relationship so that the sensor characteristics can be known. The intended sensor characteristics include sensitivity, linearity and hysteresis. Thus the process of manual measurements of the resistance and voltage sensor is no longer needed in learning has been replaced with a simulator.

With simulators, students can demonstrate something that is difficult to do in real conditions because of a limitation. Research on the importance of simulations shows a contribution to student learning [1, 2].

Research on the development and design may include potential and problems, data collection, tool design, tool manufacturing, expert validation/analysis and analysis [3]. The design includes the design of a series of schemes and physical form. The design principle in this study is not much different from the research to be conducted. A research on was done to developed the Engine Trainer simulator of Integrated Active Wiring Diagram [4]. This simulator carries out a simplified modeling of the automotive electrical flow system to illustrates the real condition.
Several studies have shown the use of sensors in various applications. Among them are the use of acceleration sensor in archery [5], ultrasonic sensors as an indicator of the amount of vehicle fuel and displays digitally [6] and the use of photodiode sensors to detect fire [7].

In terms of microprocessor processing results, input from the sensor is processed and sent to various actuators. A research conducted an automatic water presenter research using proximity sensors with LCD and sound output [8]. However, the LCD is only limited to displaying numeric and string data. Whereas graphic output of sensor output has never been done automatically.

Based on the analysis of previous studies, simulators based on measuring sensor output on the autotronic technology with numerical and graphic outputs have never been done. This research will address previous research so that the sensor characteristics in the autotronic system can be simulated.

2 Methods

This research was carried out with development research using the Plomp model which was simplified into 3 steps: preliminary research, prototyping phase, and assessment phase. This research and development lead to the production of electronic control system simulator products based on sensor output measurement. The sensor used in this research is the manifold pressure sensor (MAP). MAP sensor is a mean to measure pressure in the intake manifold. By the ECU, The change in the intake manifold pressure is compared to the vacuum conditions in the vacuum chamber of the MAP sensor. The use of vacuum cavity is the third generation of pressure sensor development [9]. The value of the pressure is sent to electronic control unit and along with other signal ECU calculate the amount of the injected fuel. The simulator will be able to simulate changes in pressure as a sensor input which is then processed by the microcontroller to be presented in numerical tabulations and graphs with the display device as the actuator. Thus the sensor characteristics that show the relationship between pressure and output resistance or voltage MAP sensor can be seen visually.

2.1 Initial investigative phase

At this stage an initial analysis or problem identification is done, a needs analysis and concept analysis, and a literature review is needed in the development of the system. In term of simulator as learning aid for need analysis, this stage looks for gaps between student needs and teacher desires. The easiest approach is to find material that is considered difficult and can be helped by the provision of learning media [10]. Concept analysis aims to determine the goals of the autotronic system, the sensor characteristics of which the output will be measured. In the analysis of the concept the researcher identified the essential concept of the content, which are the features and parameters needed in the development of an automated system simulator based on measuring sensor output.

2.2 Design and Realization Phase

At this stage, it is done through a sketch of a design on paper by modeling the system and implement the paper design into a computer using CAD for the frame and holder of the simulator and arrangement of components. The design phase has characteristics starting from the end and ending at the beginning. This means that the design can give an idea that the final product will be in accordance with the initial design.

2.3 Assessment phase

The evaluation stage is formative evaluation which includes self evaluation, prototyping (expert reviews, one-to-one, and small groups), and field tests. In the evaluation phase, the instruments that have been prepared are used to validate the simulator product. Including trials during the installation of electronic circuits and mechanical circuits. Evaluation results that do not meet the established objectives will be returned to the previous phase.

Data collection is done using expert validation sheets to test the design and the product made. In addition, the observation sheet is used to test the running of the simulator product as intended.
Data analysis techniques used a Likert scale assessment for the results of the validation of user experts with the following criteria:

<table>
<thead>
<tr>
<th>Range (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>81.26 - 100</td>
<td>Very valid</td>
</tr>
<tr>
<td>62.51 – 81.25</td>
<td>Valid</td>
</tr>
<tr>
<td>43.76 – 62.50</td>
<td>Less valid</td>
</tr>
<tr>
<td>25 – 43.75</td>
<td>Not valid</td>
</tr>
</tbody>
</table>

3 Results and Discussion

Based on the method chosen, the results of the study are presented in a coherent manner according to the stages of research in the development of a simplified Plomp model. In the initial investigation phase, an analysis of the need for a media simulator is needed and identification of the needs of the components and materials needed in making the simulator. The results of the needs analysis show that the media that have been used in learning the course of autotronic are still in the form of measuring sensor performance manually. Users still use measuring devices to measure sensor output and record the test results into a table for graphs. Then the sensor characteristics were analyzed such as linearity, sensitivity and hysteresis. Considering the need for sensor output processing in the autotronic control system in the voltage signal, the measurement results of the sensor output in the form of resistance still need to be calculated manually using the voltage divider equation.

![Simulator of Manifold Absolute Pressure sensor](image)

Based on the results of the initial investigation, a simulator is needed which is able to quickly show the sensor test results and can display the sensor output in the form of voltage without the need to perform calculations manually. In addition, the simulator can also display in tabulation and graph the relationship between sensor input and output. For this need, the component needs are identified: Absolute Pressure Manifold Sensor, Microcontroller, power supply, Vacuum pump, Manometer, Multitester. The identified components are then included in the Manifold Absolute Pressure Sensor performance simulator design.

Design and Realization Phase have resulted in a Manifold Absolute Pressure Sensor performance simulator design. The design of this simulator is in the form of a display table that has several components installed, namely MAP sensor, microcontroller, adapter, vacuum pump and...
manometer. On the side of the upright board there is a multimeter and the simulator electrical circuit information or instructions for use.

Based on the design, the simulator is manufactured. Figure 1 shows the simulator that was made. Wherever possible the realization follows the design that has been made. However, in the process of making it possible to be adjusted for certain reasons.

Based on table 2, media experts gave an assessment of scores 3 and 4 for all assessment indicators. There are no indicators that get a value of 1 or 2. The total score obtained is 28 out of a total score of 32. When compared to the scale of validity rating tools, it is categorized as very valid. As such, the MAP system simulator testing the MAP sensor is very feasible to use.

In addition to media assessments, media experts also provide advice or input for improving the simulator. The suggestion given is the need to provide an empty table so users can try it manually. This suggestion by the researcher cannot be fulfilled because the reason for developing the simulator is that it wants to eliminate the manual table filling activity that the previous model had. Nevertheless, manual measurements are still provided, but without a specific table.

<table>
<thead>
<tr>
<th>Table 2. Validation results by media expert</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Assessment indicator</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------</td>
</tr>
<tr>
<td>1</td>
<td>The Attractive aspect of simulator design</td>
</tr>
<tr>
<td>2</td>
<td>Precise component lay out</td>
</tr>
<tr>
<td>3</td>
<td>The size of the simulator is appropriate</td>
</tr>
<tr>
<td>4</td>
<td>Simulator is easy to use</td>
</tr>
<tr>
<td>5</td>
<td>Simulator comfortable to use</td>
</tr>
<tr>
<td>6</td>
<td>Manual book may help user</td>
</tr>
<tr>
<td>7</td>
<td>The texts of manual book are clear</td>
</tr>
<tr>
<td>8</td>
<td>The pictures of manual book are clear</td>
</tr>
<tr>
<td></td>
<td>Total score</td>
</tr>
<tr>
<td></td>
<td>Max score</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3. Validation results by subject expert</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Assessment indicator</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------</td>
</tr>
<tr>
<td>1</td>
<td>The simulator matches the competency of measuring sensor output</td>
</tr>
<tr>
<td>2</td>
<td>Simulator wiring is correct</td>
</tr>
<tr>
<td>3</td>
<td>The simulator component works well</td>
</tr>
<tr>
<td>4</td>
<td>Simulation of sensor input readings is correct</td>
</tr>
<tr>
<td>5</td>
<td>Simulation of sensor output readings accordingly</td>
</tr>
<tr>
<td>6</td>
<td>Microcontroller can process sensor output</td>
</tr>
<tr>
<td>7</td>
<td>The simulator can show the correlation of sensor input and output</td>
</tr>
<tr>
<td>8</td>
<td>Compatibility of manual book and simulator</td>
</tr>
<tr>
<td></td>
<td>Total score</td>
</tr>
<tr>
<td></td>
<td>Total score (both)</td>
</tr>
<tr>
<td></td>
<td>Max score</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
</tr>
</tbody>
</table>

Material experts 1 and 2 all scored scores on scores 3 and 4, with most indicators scoring by a score of 4 (Shown at Table 2 and Table 3). The percentage was 96.8%, which meant that the automated simulator MAP sensor testing was very valid. With the results of the assessment of media experts and material experts all of them giving a percentage above 81.26% it can be concluded that the automatic system simulator for testing the performance of the MAP sensor is declared very valid.

Material expert advice can be explained as follows: need to repair manual books, need work instrument tables for students, modules need to be added in description, use of standard sentences.
The suggestions from the experts above have been improved except in the preparation of the instrument table which is more or less the same as the advice of the media experts.

4 Conclusion

Based on the results of research and discussion can be concluded
1) A simulator of learning media for automotive electronic system based on measuring the output of the MAP sensor has been prototyped
2) Testing simulator of learning media system that is based on automatic measurement output MAP sensor performance can display the relationship of sensor input and sensor output in the form of tables and graphs

Reference

Abstract. The development of vocational education learning requires a needs analysis to ensure that the quality of learning process and outcomes is appropriate with the expected objectives. Needs analysis identifies carefully and in detail the needs of the learning process. This study aims to analyze personal, skills, organization, and facility needs in developing production-based learning models through aligning competencies with industry. The research method used descriptive research with a calculated average. The mapping of knowledge, skills and attitudes are owned by 91.67% of the personal needs. Communication and collaboration skills needs are 93.33%. Creativity and critical thinking need in completing work is 92.50% of the skill needs. Clarity of objectives, procedures, and standard operating procedure for learning implementation is 92.50% of the facility need. Needs analysis in developing production-based learning model are: 1) industry internship, competency mapping; 2) soft skills development and harmony with work culture; 3) Goals and performance targets alignment, and 4) Standard Operating Procedure (SOP) in learning.

Keywords: Needs analysis, Production-based learning, Competency alignment

1 Introduction

Vocational education is an educational institution that prepare graduates to work in harmony with industry and community needs. Vocational education urgency must be seen from various dimensions. Student’s dimensions expect improvement in self-competence, opportunities to work, prepare further studies, and adapt to change. Business world’s dimensions obtain high quality worker, ease business financing, and business world development. Vocational education also has multi functions. If managed properly vocational education can give great contribution for the national development goals. Vocational education plays a strategic role in produces competent workforce that is globally competitive and promotes sustainable development. Vocational education pro-employment, pro-activity, pro-growth, pro-distribution, and pro-prosperity (Yudiono, et al., 2018).

Vocational education has great urgency, so sustainable adaptation and anticipation to changes is needed. Changes in vocational education are carried out through curriculum reengineering and learning innovation. Reengineering has positive impact on both vocational education and graduates quality. Vocational education curriculum must be aligned with the competency needed by industry. Curriculum as a spirit in vocational education must be aligned regularly with the changes in competency needed by industry. Curriculum changes also impact in the learning model used. Teachers always make innovation in learning to adjust curriculum changes. Learning innovation
encourage vocational education to implement learning processes that can actually build productive competencies, such as product-based learning, projection-based learning, and others.

Production-based learning is integrating production activities in the industry into learning activities in schools. Alignment of industry competence with the vocational education curriculum becomes the spirit of a production-based learning model to obtain competency mapping. The competency mapping determine product or design that will produce by student in school or industry based on the adequacy of facilities. Implementation of industrial production-based learning using the ACDIE model (Alignment, Conceive, Design, Implement, Evaluation). Alignment Stage is the most important stage in synchronizing the competencies need with industry. This stage determines the types of products that will make by consider the competencies achieved, the equipment used, the implementation of learning and the strengthening of work culture. The Conceive stage strengthens the understanding in production-based learning process, where students with the guide from teachers discuss the learning process and determine the products that will be produced. The Design stage creates detail designs based on alternative product choices. In the implementation stage, students start production process through learning activities and mentoring by the teacher. The evaluation phase is carried out through assessment on the process and the final product. Students present the performance of the process and the products produced. The alignment stage is the most important stage to analyze production-based learning model needs. The needs analysis at this stage is carried out in detail by using the priority scale so the alignment results support the next stage. Needs analysis is a preliminary study to assess the needs for develop education quality (Garira, 2020).

Needs analysis plays important role in education development so the implementation appropriate with the expected goals. Needs analysis avoids the gap between the expected goals and the real conditions of the learning process. Learning needs analysis is needed for identifying relevant needs based on priorities. Learning needs analysis determine actions and provide data in order to analyze learning effectiveness. Identification of learning needs determines student’s competency gap, appropriateness learning activities, and the accuracy of the targets that follow the activities. Needs analysis is process to determine and deal about needs because of the gap between the current conditions and desired conditions (Klaharn, 2017). Based on these problems, this study analyzes personal, skills, organization, and facility needs in developing production-based learning models through aligning competencies with industry to improve mechanical skills.

2 Methodology

This research approach used descriptive method. Thirty research subjects consisted of mechanical engineering teachers and lecturers, industry partners, vocational education policy makers. Data collection used questionnaire to analyze personal, skills, organizational, and facilities needs with predetermined criteria. The research data were processed using descriptive statistics with a calculated average in Table 1.
Table 1. Needs interpretation

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very needed</td>
<td>76 - 100</td>
</tr>
<tr>
<td>2</td>
<td>Needed</td>
<td>51 - 75</td>
</tr>
<tr>
<td>3</td>
<td>Less needed</td>
<td>26 - 50</td>
</tr>
<tr>
<td>4</td>
<td>Not needed</td>
<td>0 - 25</td>
</tr>
</tbody>
</table>

3 Results

The results revealed that the analysis criteria for personal, skills, organization, and facility needs in develop production-based learning through aligning competencies with industry. Personal needs analysis show mapping of knowledge, skills and attitudes currently reached 91.67% from the required criteria. Industrial internships in order to improve student’s and teacher’s competency are 92.50% from the required criteria. Mechanical skills certification development is 86.67% from the personal needs. Teamwork development in competency alignment between the school and industry is 86.67% from the required criteria, while the entrepreneurship development is 84.17%. Overall results of personal needs analysis in developing production-based learning model is 88.33% from the predetermined criteria. The results of the analysis of personal needs is shown in Table 2.

Table 2. Personal needs analysis

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Percentage (%)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mapping of current knowledge, skills and attitudes</td>
<td>91.67</td>
<td>Very needed</td>
</tr>
<tr>
<td>2</td>
<td>Industrial internship</td>
<td>92.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical skills certification development</td>
<td>86.67</td>
<td>Very needed</td>
</tr>
<tr>
<td>4</td>
<td>Improvement in mentor’s pedagogical competency</td>
<td>88.33</td>
<td>Very needed</td>
</tr>
<tr>
<td>5</td>
<td>Teamwork development</td>
<td>86.67</td>
<td>Very needed</td>
</tr>
<tr>
<td>6</td>
<td>Entrepreneurship development</td>
<td>84.17</td>
<td>Very needed</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>88.33</td>
<td>Very needed</td>
</tr>
</tbody>
</table>

Skills analysis needs reach 89.03% of the criteria in developing production-based learning model through aligning competencies with industry. Skills needs analysis is needed in developing a production-based learning model. Working skill adequacy is 85.83% from the skill needed. Expertise standard adequacy expected by the industry partner from the learning reach 85.83% from the needs. Mentoring ability in implementation of the learning model is 85.83% and application of industry culture in increasing student soft skills reaches 90.83% from the skills need analysis for
learning model development. Skill needs analysis in developing production-based learning model through aligning competencies with industry are shown in Table 3.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Percentage (%)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Working skill adequacy</td>
<td>85.83</td>
<td>Very needed</td>
</tr>
<tr>
<td>2</td>
<td>Expertise standard adequacy that expected by the industry partner</td>
<td>85.83</td>
<td>Very needed</td>
</tr>
<tr>
<td>3</td>
<td>Mentoring ability</td>
<td>85.83</td>
<td>Very needed</td>
</tr>
<tr>
<td>4</td>
<td>Industrial culture application</td>
<td>90.83</td>
<td>Very needed</td>
</tr>
<tr>
<td>5</td>
<td>Creativity and critical thinking on job solving</td>
<td>92.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>6</td>
<td>Communication and collaboration ability</td>
<td>93.33</td>
<td>Very needed</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>89.03</strong></td>
<td></td>
</tr>
</tbody>
</table>

Production-based learning development through aligning competencies with industries partner requires 86.46% joint and sustainable organizational management. Organizational management criteria is needed when developing learning models. Goals and performance targets alignment contribute 89.17% in organization management needs for developing learning models. Organizational needs analysis in developing learning model require 85.83% human resource partnerships management. Organizational needs require 81.67% resource partnership to support the implementation of learning models and 89.17% harmony with work culture in improving student soft skills. Table 4. show the results of the organizational need analysis in developing production-based learning model.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Percentage (%)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Goals and performance alignment</td>
<td>89.17</td>
<td>Very needed</td>
</tr>
<tr>
<td>2</td>
<td>Resource development partnership</td>
<td>85.83</td>
<td>Very needed</td>
</tr>
<tr>
<td>3</td>
<td>Resource partnership</td>
<td>81.67</td>
<td>Very needed</td>
</tr>
<tr>
<td>4</td>
<td>Work culture alignment</td>
<td>89.17</td>
<td>Very needed</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>86.46%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Facility needs analysis contributed 87.17% in developing production-based learning model through industrial competencies alignment. Identification and mapping of learning facilities reach 87.50% of the facility needed in implementing production-based learning. SOP Standard Operating Procedure (SOP) in the implementation of learning require 92.50% of the facilities needed. Development of learning models require 92.50% clarity of objectives and procedures for implementing activities. Conflict management criteria require 82.50% of the learning model need, conflict management are very needed when problems arise. Facility need requires 80.83% resource
sharing implementation in supporting the development of learning models based on alignment with industry. The results of need analysis in developing learning models are shown in Table 5.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Percentage (%)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning facility identification and mapping</td>
<td>87.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>2</td>
<td>SOP in learning implementation</td>
<td>92.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>3</td>
<td>Objectives and procedure clarity</td>
<td>92.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>4</td>
<td>Conflict management</td>
<td>82.50</td>
<td>Very needed</td>
</tr>
<tr>
<td>5</td>
<td>Resources sharing Implementation</td>
<td>80.83</td>
<td>Very needed</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>87.17</td>
<td>Very needed</td>
</tr>
</tbody>
</table>

5 Discussion

This study analyzes personal, skills, organization, and facility needs based on predetermined criteria for developing production-based learning models through competency alignment. The results of needs analysis determine priority criteria in developing learning models. The results show that the priority scale of personal needs analysis is: 1) industry internships, 2) mapping of current knowledge, skill, and attitude, 3) improvement in mentor’s pedagogical competency, 4) mechanical skill certification development, 5) teamwork development, and 6) entrepreneurship development. Industry internships play an important role in improving the teacher’s and student’s competency. Industry internships give attention to competency mapping in learning achievement and availability of competencies in the industry. Competency mapping is an integral part of internships. Teachers as agents of change must have superior competency. Excellent teacher competency has a great impact on increasing the student’s competency in industry internships. Industry internships are the best way to apply theoretical and conceptual knowledge in actual learning, increasing discipline that is appropriate with industrial work culture (Tindowen, et al. 2019). Industrial internships also have an impact on student’s skills improvement (Sahir, et al. 2016).

The priority scale of the skill needs in developing production-based learning models includes: 1) communication and collaboration skills, 2) creativity and critical thinking in completing work, 3) application of work culture, 4) skill standards suitability, 5) mentoring ability, and 6) working skills adequacy. Soft skills development becomes the priority for the development of learning models and the skills needed by industry. Communication skills, collaboration, creativity, and critical thinking integrated in production-based learning can improve students’ soft and hard skills (Yudiono, et al. 2019). The competency needs are not only significant resource management and mechanical knowledge strengthening, but also developing the competency requirements needed by the industry. The industry requires both the competitiveness development and ability to innovate when facing rapid changes (Palma, et al. 2012).

Organization needs priority scales in developing production-based learning models such as: 1) performance goals and objectives alignment, 2) harmony of work culture, 3) human resource development partnerships, and 4) resource partnerships. Between vocational education and industry partners must have an understanding in formulating goals, performance targets especially graduate
competencies, building work culture, and developing resources. Partnerships must be formulated together by involving relevant stakeholders. Partnerships need to be institutionalized to improve alignment performance. An alignment agency develops a competency alignment framework, optimizes the role of industry and policy makers, resources development and empowerment, integrates competencies into the curriculum and implementation of learning, and evaluates the performance of alignment comprehensively (Yudiono, 2017). Educational cooperation with industry will be more meaningful and beneficial if it is institutionalized. Evaluation of partnerships is done through evaluating the transfer of knowledge and technology of both parties, industry and university are complementary, so cooperation must build legally (Candan and Nuriye, 2010). Strategy to build sustainable partnerships is strengthening the commitment of related parties, promoting cooperation, sharing and strengthening the content of cooperation, and spreading professional knowledge (Xiang and Yuan, 2019). The harmony of work culture is implemented in teaching and learning activities to familiarize students in their environment later. Vocational education will be effective if training experience is dedicated to build work and correct thinking habits so it is appropriate for their future jobs (Prosser and Quigley, 1959).

Priority scales of need facilities in developing learning models is: 1) clarity of objectives and procedures, 2) standard operating procedure in implementation, 3) identification and mapping of learning tools, 4) conflict management, and 5) resource sharing implementation. It is undeniable that learning quality is greatly influenced by adequate facilities and infrastructure. Vocational education will be effective if the training assignments are carried out in the same manner, tools and machinery as those applied in the workplace (Prosser & Quigley, 1959). Implementation of learning requires facilities that can support its performance so learning is interesting and has impact on increasing students' competency and learning experience.

6 Conclusion

The results of the need analysis in developing production-based learning model through aligning competencies with industry partners can be concluded:

1. The priority of personal needs in the learning models development is industry internship at 92.50%, and the mapping of knowledge, skills and attitudes currently owned by 91.67%.
2. The priority of skill needs is communication and collaboration skills is 93.33% of skills needs, and creativity and critical thinking in completing work is 92.50% of the priority.
3. Harmony of work culture, performance goals and objectives is 89.17% of the priority organizational needs.
4. Clarity of objectives and procedures, and the SOP of learning implementation is 92.50% of the priority needs in the development of production-based learning model.
References


Jigsaw Learning Model for Increasing Competence to Diagnose and Repair Single Phase Motor Running-Capacitor Type

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Abstract. Vocational high school students are unusual to discussions in group to solve problems, because they get a curriculum that focuses on practice and industrial-oriented. This research aim so that vocational students can also become professionals in solving problems with discussions and practice. Jigsaw learning model is one of the methods of learning used in this research. Students can diagnose errors in one-phase electric motors through expert team discussions. This research took the data with pre-test and post-test, and also the practice test with the accuracy of diagnosing and repairing. The results showed the ability of students increased from the average value of 65.91 to 81.45 (23.58%).

Keywords: Jigsaw Learning Model, Single Phase Motor, Competence.

1 Introduction

Indonesia is involved in the era of free markets and globalization in the fields of technology and labor. This demands to be more competitive in order to win the competition in the service and goods industries. therefore it demands to work and study harder and knows no time. The rapid development of Science and Technology demands changes in the world of education.

Learning with the lecture method is widely used. this model tends to be unidirectional in the delivery of subject matter. Student participation will be low because the teacher plays an active role. the teacher becomes a model in learning and becomes the center of knowledge for students. However the lecture method is still needed for some purposes. One of the improvements in the quality of vocational education in Indonesia can be done by learning in class [1]. Effective and efficient learning will get optimal output [2].

Teaching and learning activities must consider students more. Besides that, the learning flow does not have to come from the teacher to the students. Students can also teach each other with other students. The teaching system that provides opportunities for students to work with fellow students and structured tasks is called the mutual cooperation learning system. The teacher will be helped by this method because learning is student-centered [3][4][5].

Cooperative learning is one type of student-centered learning approach, much of the literature has documented that this approach is effective in assisting students in the learning
process, effective communication and skills in understanding knowledge, and promoting students positive attitudes towards their own learning [6].

Slavin [7] states that cooperative learning is a teaching and learning strategy that emphasizes the attitude or behavior of working or helping each other in an organized cooperative structure in groups consisting of two or more people.

There are several kinds of learning models based on cooperative learning, including the Student Teams Achievement Divisions (STAD) cooperative learning model, Jigsaw, Group Investigation (GI), Numbered Heads Together (NHT), and Think Pair Share (TPS) [8]. Problem solving skills can be improved by the jigsaw method because students learn in small and specific groups [9].

This study only discusses the jigsaw model of cooperative learning. This is a learning model that is very encouraging to students because students are divided into heterogeneous groups (differences in gender, academic ability, and so on). study groups consisting of six to seven students.

2 Method

This research was conducted in the first semester of the 2019/2020 school year at SMK Negeri 1 Semarang, located on Jl.Dr. Cipto no 93 Semarang city. The sample used in this study is class XI TPTL 3 with a total of 34 students. The implementation of this research is an effort to improve the learning of Electrical Equipment Maintenance Subjects, Sub-discussion to diagnose and repair 1-phase electric motor errors in class XI.

The test used in this study consisted of 2 types, the pre-test which was carried out to determine the students 'initial knowledge or abilities, and the post-test which was used to measure the increase in students' abilities after the Jigsaw model learning was held.

Classroom action research is in the form of a spiral cycle which includes the following activities: (1) application, (2) action givers that form cycle to cycle until the research is considered complete, so that data can be collected as an answer to the problem [10]. The research was conducted in two cycles, namely cycle I and cycle II. Teachers and observers make observations of student learning activities during the implementation of the teaching and learning process using the jigsaw method. The results of the observations were analyzed as material for reflection to increase activities in cycle II.

Teacher conducts a pre-test at the beginning of the cycle before learning the jigsaw model to find out the students' initial knowledge or abilities about the material to be taught. Teacher also gives the final test (post-test) to students individually at the end of the jigsaw model learning to measure the extent to which the students' ability increases after the jigsaw model learning is held and students are not shown to cooperate with each other between group members.

3 Result and Discussion

3.1 Data Analysis

Data analysis is carried out every time the learning cycle ends. This analysis includes:

1. Student achievement

Evaluation results were analyzed to determine student learning completeness. The results of the evaluation were analyzed to determine the students' learning
completeness by analyzing the formative test result data using mastery learning. Absorption of students can be known in this way. Students are called complete learning if they have reached a score of $\geq 60\%$, and classical learning completeness, namely $\geq 85\%$ of all students who achieve learning completeness. Quantitative data on learning completeness in Electrical Equipment Maintenance subjects in cycle I will be compared with quantitative data on learning completeness in cycle II.

2. Student learning activities
To determine student learning activities, the data contained in the observation sheet will be calculated. Calculation of the average frequency of student learning activities K, C, B using the formula as below [11]:

$$\text{student learning activities} = \frac{\sum \text{Student K, C, B}}{\sum \text{Student with level K, C, B}} \times 100\%$$  \hspace{1cm} (1)

With:
K = Less
C = Enough
B = Good

3. Student perceptions
The impression of students after participating in the jigsaw model learning is known by the questionnaire data filled out by the students. Quantitative calculations can be calculated based on the following formula as below:

$$P = \frac{F}{N} \times 100\%$$  \hspace{1cm} (2)

With:
P = Percentage that answered the options
F = Number of respondents who answered the option
N = Number of respondents

3.2 Result
Researchers can show that the average value in the first cycle of 65.91 becomes the average value to 81.45, which means that it has increased to 23.58%, with an average value of 81.45 which means that it has passed the minimum limit of the average productive training eye, which is 70.00, shown in Figure 1.

![Fig. 1. Chart comparison cycle I & cycle 2](chart.png)
The researcher ensured that for the thoroughness of the study, the students carried out a post test to find out that there were significant changes from not knowing to knowing and understanding better. With the results of the post test, it can be seen from the results in Figure 2. By looking at the comparison chart, you get a better picture of the increase to be seen from the average value and statistical approach. The post-test uses multiple choice tests with the same questions as the pre-test.

To find out students’ activities and perceptions, researchers also used questionnaire data given to students about the students’ viewpoints to accept the jigsaw learning method with the following results: Researchers divided into 4 categories, namely: a score of 10-20 means no interest; 21-40 means less interest; 31-40 means quite interested; 41-50 means interested.

<table>
<thead>
<tr>
<th>No</th>
<th>Observed</th>
<th>Less (K)</th>
<th>Enough (C)</th>
<th>Good (B)</th>
<th>K %</th>
<th>C %</th>
<th>B %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interaction</td>
<td>16</td>
<td>15</td>
<td>3</td>
<td>47.12</td>
<td>44.12</td>
<td>8.82</td>
</tr>
<tr>
<td>2</td>
<td>Responsible</td>
<td>24</td>
<td>10</td>
<td>0</td>
<td>70.59</td>
<td>29.41</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Positive</td>
<td>4</td>
<td>23</td>
<td>7</td>
<td>11.76</td>
<td>67.65</td>
<td>20.59</td>
</tr>
<tr>
<td></td>
<td>interdependence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Member</td>
<td>2</td>
<td>16</td>
<td>16</td>
<td>5.88</td>
<td>47.06</td>
<td>47.06</td>
</tr>
<tr>
<td>5</td>
<td>Evaluation</td>
<td>0</td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

From Table 1, the researcher wants to show student interaction with the discussion, the highest percentage is in the low score, responsibility also ranks the highest at 70.59%, the highest percentage of communication lies in Good at 47.06%. Evaluation of the percentage in sufficient condition is 100% of XI TPTL 3 students in conditions are neither less nor good. The results that have been achieved in this study are unsatisfactory because of the lack of support for student activeness, but in terms of practice of the material taught, students get quite encouraging standards with the value of practice that continues to increase beyond the standard limit for vocational
4 Conclusion

In this classroom action research, the conclusion is that: (1) The jigsaw learning model has increased the competence of students with an average score of 65.91 to 81.45. It shows that there was an increase of 23.58%. (2) Pre-test and post-test data showed an increase in the average value from 6.27 to 7.58. (3) Jigsaw learning model received a good enough response from students with enough interested category. (4) The activeness of students in the discussion of the jigsaw model is still low in the enough category.

References

The Relationship between Students' Stress on Work Internship with Students' Achievement Index in Department of Family Welfare Engineering Faculty Unnes

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Abstract. College success is not only influenced by cognitive and psychomotor abilities, but also by its affective capacity. Affective ability is not only seen from the attitude of students during the face-to-face lecture process but also how their attitude or behavior is in responding to the burden and work internship assignments on campus. Work stress is a condition of tension that creates physical and psychological imbalances, which affect one's emotions, thought processes, and conditions (Rivai, 2004). Too much work stress can threaten a person's ability to deal with and adapt to his environment. In this study, it will be revealed the relationship between work stress and student practice with the achievement of the cumulative achievement index in study programs majoring in Family Welfare Education (PKK).

The purpose of this study is to find out 1). the students' level of stress in work internship in PKK majors, 2). the cumulative achievement index of students majoring in PKK, and 3). whether there is a relationship between the stress on work internship of students in the PKK majors with the cumulative achievement index achieved.

Keywords: work internship stress, achievement index, PKK majoring students, correlation, significance.

1. Introduction

Education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation and state (Law Number 20 of 2003 concerning the National Education System, Article 1 Paragraph 1). Higher education is an educational institution that implements the teaching and learning process professionally in a number of disciplines, technology, sports, arts, and culture and one of the goals to be achieved from the educational process in higher education is the achievement of academic achievement.

Learning outcomes obtained by students can be seen through numbers or symbols on the report card as the final formulation of learning outcomes (Sumadi Suryabrata, 2001: 320). Furthermore, Nana Sudjana (2004: 5) explains that learning outcomes are abilities students have after they receive their learning experience. Whereas Purwanto (1992: 18) said that student learning outcomes can be viewed from the cognitive aspects, namely students' abilities in knowledge (memory), understanding and application (application), analysis, synthesis and evaluation.

Learning outcomes are influenced by several factors, both originating from within the individual and from outside the individual. Slameto (2000: 54) says there are several factors that affect learning outcomes obtained by students, including: 1). internal factors, namely factors that originate within the student, and are divided into three parts namely physical factors (health
and disability), psychological factors (intelligence, attention, interest, talent, motives, learning skills, maturity, and readiness), and fatigue factors (physical and spiritual). 

2) External factors, namely factors originating from outside the student. Some examples of these external factors are, a) family (how parents educate, parental treatment of children, relationships between family members, home atmosphere, family economic situation, understanding of parents and cultural background), b) school factors (teaching methods, teacher and student relationship curriculum, school discipline, learning tools, school time, teaching standards, building conditions, learning methods, and homework assignments), and c) community factors (such as student activities in the community, mass media, associates, and community life forms). From these opinions it can be said that fatigue (physical and spiritual) will affect learning outcomes.

Work stress is a pressure that will affect emotions, thought processes, work methods and physical conditions of a person, where the pressure comes from one's work environment (Yoder and Staudoher (1982) in Goetsch (2008)). Meanwhile, according to Sarafino (1994: 74) Stress experienced by students is a condition that is caused when differences in a person or environment associated with individuals, namely between the desired situation with biological conditions, psychological or social system of the individual. According to Beehr and Newman quoted in Fred (2007), stress is a condition that arises from interactions between humans and work and is characterized by human changes that force them to deviate from their normal functions. In general, people who experience stress, psychological conditions tend to experience feelings of worry, pressure, fatigue, fear, depression, anxiety, and anger. While the attitude will be impatient, like to argue, withdraw, etc. (IKAPI: 2008).

Learning achievements in the Department of PKK FT UNNES consist of four study programs namely the culinary education study program, the fashion education education program, the district education administration program and the PKK study program are different due to differences in scientific disciplines studied, where learning outcomes in the PKK FT UNNES department consist of learning achievements attitude, knowledge, general skills and special skills.

To support the achievement of learning skills required supporting courses, namely practical subjects. The results of observations on students majoring in PKK, it is known there are some students feel burdened with practical subjects because they feel the skills / skills lack. If students feel this way, it is feared that students will experience stress in learning practical subjects.

The success of the study is an achievement that is dreamed of by all students. College success is not only influenced by cognitive and psychomotor abilities, but also by its affective capacity. Affective ability is not only seen from the attitude of students during the lecture process theory or practice, but also must be seen how the attitude or behavior in responding to the burden and tasks of daily lectures. In this case is the attitude or reaction of students when they have practical workloads so that it affects the stress of work internship on campus.

Research conducted by Rajni Kumari (2012) illustrates: "correlated using Pearson product moment correlation method. Results showed a positive correlation between stress and academic achievement. Significant differences exist in the academic achievement of students having high, moderate and less stress. Students with high and moderate stress performed better than students having less stress. Further it was also found that stress and academic achievement are not mediated by gender ". The results of the study show there is a positive correlation between stress and academic achievement.

Research conducted by Hijrana Bahar (2017) who examined the Relationship of Stress with Nursing Student Achievement Index at Alauddin Makassar State Islamic University in 2010, concluded that there was a significant relationship between stress and nursing student
achievement index. The results of other studies were shown by Fajar Slamet Ramdani (2016) who examined the Relationship between Student Stress Levels and Academic Achievement Index Results at UPI, and the results of his study concluded that stress levels were not significantly related to Achievement Index.

Every student can have a different attitude when they manage the stress of work internship being undertaken. Students who are able to manage well the work internship stress will not have a negative effect on the achievement of their achievement index (IP) and vice versa if the student is not able to manage well the work internship stress will have a negative effect on the achievement of his IP. In this study, it will be revealed the relationship between work stress and student practice with the achievement of the cumulative achievement index in study programs majoring in Family Welfare Education (PKK). The purpose of this study is to find out: 1) What is the level of stress of student practice work in PKK majors? 2) How is the cumulative achievement index of students majoring in PKK? 3) Is there a relationship between the stress of work internship of study program students in the PKK majors with the cumulative achievement index achieved.

2. Methodology

This type of research is a correlational study because researchers want to know about the presence or absence and strength of a weak relationship between work practice stress variables and student achievement index in PKK FT UNNES. The existence of a relationship and the level of this variable is important because, by knowing the level of the relationship that exists, researchers will be able to develop it in accordance with the objectives of the study.

The population in this study were students majoring in PKK FT UNNES consisting of 896 students in the Fashion Study education program, Catering Education, Beauty Education and Family Welfare Education. Formula or formula to calculate the minimum number of samples using the Slovin formula that was introduced in 1960. Slovin formula is commonly used in survey research where usually the number of samples is very large, so a formula is needed to get a small sample but can represent the entire population. The percentage of error rate that can be tolerated is 10% (Sugiyono, 2015), the formula is as follows:

\[ n = \frac{N}{1 + N e^2} \]

Information:
- \( n \): Sample size
- \( N \): population size
- \( e \): The degree of error in choosing a sample member who is tolerated (error rate here is 10%)

The population in this study amounted to 896 students the tolerable error rate is 10%

\[ n = \frac{896}{1 + 896 \times 10\%^2} \]

\[ = 90 \]

The number of samples taken in this study were 225 students from the Fashion Management Education Study Program, Catering Education Study Program, Beauty Education Study Program and PKK.

The sampling technique uses cluster random sampling. Cluster sampling is done by dividing the population into several groups. Distribution can be based on location, age, gender,
and other equal categories, in this case dividing the population based on existing study programs in the department of PKK FT UNNES.

Variables are phenomena that are the focus of research attention to be observed or measured, so this research variable consists of independent variables namely “work internship stress” and the dependent variable “student cumulative achievement index”. The independent variable in this case the work internship stress assumed its value affects the dependent variable. While the cumulative achievement index variable is a variable whose value depends on the dependent variable value.

The tool used in the data collection method in this study was a questionnaire through Google Doc to get data on work internship stress, the questionnaire in this study used a closed questionnaire, while to obtain cumulative achievement index data using a documentation instrument through "Sikadu". For the validity of the instrument using content validity / content. This content validity is estimated through testing the content's appropriateness or relevance through rational analysis by a competent panel or through expert judgment so that content validity is expected to ensure that the measurements carried out include a set of adequate and representative items, which reveal the concepts being studied.

Data analysis was performed after data and evidence supporting the research had been collected. This means that the data analysis process can be carried out after the data collection, data tabulation, data analysis, data presentation to answer the problem formulation and answer the hypotheses that have been submitted. Data analysis in this research is descriptive statistics and Product moment correlation. Descriptive statistics in this study are used to help describe (describe) the actual situation (facts) of work internship stress and cumulative achievement index. Correlational statistics Product moment is used to determine how strong the relationship between work internship stress and cumulative achievement index.

3. Research Results and Discussion

The results of the study of the relationship between work internship stress and the cumulative achievement index (IP) of students in the PKK majors are illustrated in each study program.

As a basis for analysis and discussion, the categories of work internship stress are as follows:

<table>
<thead>
<tr>
<th>Questionnaire Range Value Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 - 63</td>
<td>Very low stress</td>
</tr>
<tr>
<td>64 - 92</td>
<td>Low stress</td>
</tr>
<tr>
<td>93 - 121</td>
<td>Stressful enough</td>
</tr>
<tr>
<td>122 - 150</td>
<td>High stress</td>
</tr>
<tr>
<td>151 - 179</td>
<td>Stress is very high</td>
</tr>
</tbody>
</table>

For analysis and discussion of student achievement index achievement categories, it is based on the graduation predicate category for undergraduate and diploma students, as in the 2018 Semarang State University Academic Guide.

Graduation predicate for Bachelor and Diploma students is:

a. With Praise if the student reaches a Cumulative IP from 3.51 to 4.00;
b. Very satisfying if students achieve a cumulative IP from 3.01 to 3.50;
c. Satisfactory if students reach a Cumulative IP from 2.76 to 3.00.
Analysis of research data in both the stress category and Achievement Index (IP) achievements was carried out using IBM Statistics 24 and more is:

1). Culinary Education Study Program

Data on work internship stress and achievement index in the culinary education study program are as follows:

Table 2. Stress and Catering IP Analysis

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_Boga</td>
<td>80,850</td>
</tr>
<tr>
<td>IP_Boga</td>
<td>3,4755</td>
</tr>
</tbody>
</table>

Based on the data, the stress of students in the Catering Study Program (80,850) is in the low stress category, while the Achievement Index achievement (3,476) has a very satisfying category.

2). Fashion Management Education Study Program

Data on work internship stress and achievement index in the Clothing Study Education program are as follows:

Table 4. Stress and IP Clothing Analysis

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_Clothing</td>
<td>70,933</td>
</tr>
<tr>
<td>IP_Busana</td>
<td>3,4288</td>
</tr>
</tbody>
</table>

Based on the data, the stress of the students of the Fashion Management Education program (70,933) was in the low stress category, while the Achievement Index achievement (3,429) had a very satisfying category.

2). Fashion Management Education Study Program

Data on work internship stress and achievement index in the Fashion Design Education Study Program students can be seen in the table below:

Table 5. Correlation between Work Stress and IP in Clothing Study Program Students

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Stress_Boga</th>
<th>IP_Boga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_Boga</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>1,149</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>IP_Boga</td>
<td>Pearson Correlation</td>
<td>1,89</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>1,49</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

Based on the analysis table data above, it is known that the significance of the Pearson correlation is 0.149 (> 0.05) which means that Ho is accepted and Ha is rejected. Thus the stress of student work in practice with the IP achievements of the students of the Department of Catering Education has no relationship (uncorrelated).
Based on the data above, it is known that the significance value of the Pearson Correlation is 0.239 (> 0.05) which means that Ho is accepted and Ha is rejected. Thus the stress of student work in practice with the IP attainment of students in Fashion Design Education has no relationship (uncorrelated).

3). Beauty Care Education Study Program

Data on work internship stress and achievement index in the Beauty Education Study Program are as follows:

Table 6. Stress Analysis and Beauty IP Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>The mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_Beauty</td>
<td>75.367</td>
<td>8.67485</td>
<td>60</td>
</tr>
<tr>
<td>IP_Beauty</td>
<td>3.439</td>
<td>1.4931</td>
<td>58</td>
</tr>
</tbody>
</table>

Based on these data the Stress of Beauty Study Education program students (75.367) was in the low stress category, while the Achievement Index achievement (3.439) had a very satisfying category.

Data on the relationship between work internship stress and the IP achievements of the Beauty Study Program Study Program can be seen in the table below.

Table 7. Correlation between Work Stress and IP in Study Program Students

<table>
<thead>
<tr>
<th></th>
<th>Stress_Beauty</th>
<th>IP_Beauty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_Beauty</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>IP_Beauty</td>
<td>Pearson Correlation</td>
<td>, 128</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

Based on the data above, it is known that the significance value of the Pearson Correlation is 0.337 (> 0.05) which means that Ho is accepted and Ha is rejected. Thus the stress of student work in practice with the IP achievements of the Beauty Program Education Study Program has no relationship (uncorrelated).

4). Family Welfare Education Study Program

Data on work internship stress and achievement index in the Family Welfare Education study program are as follows:
Table 8. Stress and PKK IP Analysis

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>The mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_PKK</td>
<td>81,1224</td>
<td>14.66804</td>
<td>49</td>
</tr>
<tr>
<td>IP_PKK</td>
<td>3.4720</td>
<td>1,4011</td>
<td>44</td>
</tr>
</tbody>
</table>

Based on these data, the stress of students of the Family Welfare Education study program (81,123) was in the low stress category, while the Achievement Index achievement (3,472) had a very satisfying category.

Data on the relationship between stress of students in internship program and IP achievements of Family Welfare Education Program Study Program (PKK) can be seen in the table below.

Table 9. Correlation between Work Stress and IP in Study Program Students Family Welfare Education

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Stress_PKK</th>
<th>IP_PKK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress_PKK</td>
<td>Pearson Correlation</td>
<td>1, 068</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.661</td>
</tr>
<tr>
<td>N</td>
<td>49</td>
<td>44</td>
</tr>
<tr>
<td>IP_PKK</td>
<td>Pearson Correlation</td>
<td>068</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

Based on the data above, it is known that the significance value of Pearson Correlation is 0.661 (> 0.05) which means that Ho is accepted and Ha is rejected. Thus the stress of student work in practice with the IP achievements of the students of the Family Welfare Education Program (PKK) has no relationship (uncorrelated).

Based on the analysis of the correlation or the relationship between work internship stress with the achievement of student achievement index (IP) is known to have no significant relationship, in other words there is no relationship between work internship stress, and achievement index achieved. This is in line with the research of Diana Hasmarina (2012) where the research results obtained $p = 0.344$ ($p> 0.1$) which shows there is no relationship between stress and changes in learning achievement. Statistically there is no relationship between work stress and student achievement index in the study program of Food, Fashion, Beauty and PKK, but if you look at work stress data in four study programs in Jursan PKK shows low stress, while the learning achievement index data students in all study programs in the PKK majors showed a very satisfying performance index.

4. Conclusion

The conclusions obtained in this study are: 1). Student work internship stress for study programs: Catering in the category of low work internship stress, Fashion Education low work internship stress, Beauty Education low work internship stress and PKK also have low work internship stress; 2) Achievement of average achievement index (IP) of students in study programs: Catering Education (3,476), Clothing Education (3,429), Beauty Education (3,439) and in PKK study programs (3,472); 3). Stress of students' work internship for study programs: Catering Education, Clothing Education, Beauty Education and Family Welfare Education have no significant relationship with the cumulative achievement indeks.
5 References


The Effect of Soft Skill on the Readiness of Students in Facing Employment at the Civil Engineering Study Program at Universitas Negeri Semarang

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ABSTRACT: In higher education, students are required to be graduates who can bring success in developing career paths or professional workforce. Therefore, it is necessary to develop the hard skills of the students. In addition, they must also develop the soft skills of each student themselves. The purpose of this study was to determine the effect of soft skills on students' readiness in facing the employment in the Civil Engineering study program at the Universitas Negeri Semarang in 2016. This research was included in the regression research. From the descriptive analysis in this study, the level of soft skills ability of class of 2016 Civil Engineering students of the Universitas Negeri Semarang were included in the category of fair with the average score = 95.5. The work readiness of students of the Civil Engineering study program, Universitas Negeri Semarang was included in the category of Fair with an average value of 102.7. The results of this study also showed that the correlation coefficient (r statistic) has a positive value, then the two variables have a direct relationship. The value of the coefficient of determination or the contribution of the influence of X on Y by 0.454. This shows that the achievement of variable Y (Work Readiness) can be explained by the variable X (Soft Skill) of 45.4%. While 54.6% is determined by other variables not examined.

Keywords: Soft skill, Job readiness, Effect of Soft Skills.

1 Introduction

Schools and colleges are institutions that have the task of educating and producing quality human beings in terms of knowledge, attitudes and skills whose achievements are formed in a planned, directed and systematic manner. Learning activities or teaching and learning process are the main things in the education process. Therefore, the implementation of education is integral with the learning process that lead to the process of achieving learning objectives.

According to Law No.20 of 2003 article 19 paragraph 1: "What is meant by higher education is the level of education after secondary education includes diploma, undergraduate, master's, specialist and doctoral education programs organized by universities". This new era of
civilization requires universities to be able to produce graduates to master the ability of the workforce to survive and develop to achieve the actualization of excellence optimally. The ability of the workforce is not only in the form of intellectual intelligence but also emotional and spiritual intelligence. Intellectual intelligence is related to hard skills in certain fields which are demonstrated through work readiness, while emotional and spiritual intelligence are related to soft skills abilities associated with personality characteristics.

Soft skill is an ability, talent, or skill that exists in every human being. Soft skills are abilities that are carried out in a non-technical way, meaning that they are formless or invisible. However, soft skills can be categorized as personal and interpersonal skills. The definition of personal soft skills is the ability that is used for self-interest. For example, being able to control emotions in themselves, be able to take advice from others, be able to manage time, and always think positively, it can all be categorized as personal soft skills. Then interpersonal soft skills are defined as the skills used for oneself and others. For example, we are able to relate or interact with other people, work together with other groups, and others.

As mentioned earlier, universities are required to educate graduates who can bring success in developing career paths or professional workforce. However, the current soft skills of the students are quite alarming. Many various opinions argue that the soft skills have not been fully mastered by university graduates. Therefore, many university graduates have not been employed in their respective field. Many of the students are less able to communicate verbally. Their honesty / integrity is quite worrisome, often cheating during exams or when working on assignments, impolite and unable to collaborate with their peers. In this study, the students of Civil Engineering study program were chosen because the study program has advantages in terms of hard skills in the courses they take. In addition, the employment does not only require hard skills but also soft skills.

2 Method

The research used descriptive verification method with ex post facto and survey research. Ex post facto consists of three words, ex means observation or observation, post means after, and facto is fact or event. The overall meaning of the Ex post facto research is that it reveals events that have occurred and looks at various factors associated
with these events. Descriptive research is research intended to investigate the circumstances, conditions or other things that have been mentioned, the results of which are presented in the form of research reports, while verification research is research that aims to check the truth of other research results (Arikunto, 2013: 3).

3 Research Results and Discussion

Based on the description above, the purposes of this study are to find out:

3.1. Soft Skill Level of the Students

The results of study regarding how the ability of soft skills of the Civil Engineering students of the Universitas Negeri Semarang showed that their soft skills are included in the fair category. The average score of the X variable is 95.5 located with the range of values of $92.5 < X ≤ 99$ with the statement "fair".

3.2. Level of Work Readiness

The results of research conducted by researchers showed that the level of Work Readiness of students included in the category of "Fair". The average score of the Y variable is 102.73 which lies in the range of values of $94.26 < X ≤ 104.5$ with the category of "fair".

3.3. Effect of Soft Skill on Work Readiness

Based on the results of study conducted by researchers using the simple linear regression analysis, the regression equation $Y = 23.840 + 0.826X$ was obtained. The equation provides information that the consistency value of variable Y (Work Readiness) is 23,840. Regression coefficient X (Soft Skill) of 0.826 states that for each addition of 1% the value of soft skills, the value of work readiness increases by 0.826. The regression coefficient is positive. Therefore, it can be said that the direction of the influence of the variable X (Soft Skill) on the variable Y (Work Readiness) is positive. There is a positive influence between soft skills on students' readiness in facing the employment in 2016 class of Civil Engineering study program at the Universitas Negeri Semarang.
4 Conclusions and suggestions

Based on the results of the study, the following conclusions can be drawn:

1. Based on descriptive analysis in this study, the level of soft skills of Civil Engineering students of the Universitas Negeri Semarang is included in the category of Fair with an average value of 95.5.

2. Based on the descriptive analysis in this study, the Work Readiness of Civil Engineering students of Universitas Negeri Semarang was included in the Fair category with an average value of 102.7.

3. Based on the hypothesis test in this study, a significant effect was obtained between soft skills and students' readiness in facing the employment in the Civil Engineering study program at the Universitas Negeri Semarang. This was evidenced by:
   a. The coefficient of determination (R^2) = 0.454 which means that it has 45.4% of the work readiness achievement (Y) to 40 students can be explained by the soft skills variable (X), but 54.6% were caused by other variables which are not explained in this study.
   b. Significance test was obtained from t_{stat} = 5.617 > t_{critical} = 2.024 with a significance value of 0.000 < significance level (0.05). In this case it has a regression line equation \( Y = 23,840 + 0.826X \).

Based on the results of the study, these following suggestions can be given:

1. The students of Civil Engineering study program, Universitas Negeri Semarang are expected to improve their soft skills especially developing soft skills required for the employment.

2. Teachers must always motivate students and provide guidance for students to develop their soft skills.
References


The Effect of Teacher’s Competence to the Lathe Practice Learning Outcome of Vocational High School Students

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Abstract. This study aimed to figure out the impact of the teacher’s competence to the lathe practice learning outcome of Vocational High School (VHS) students. This study was an ex-post facto study. The subjects of this study were all VHS students in Kebumen Regency in grade XI with total amount as 1035 students. The data collection used the questionnaire with Likert scale and documentation. The data was analyzed using regression analysis. The result of the study showed that there was a significant impact from the teacher’s competence to the lathe practice learning outcome of VHS students in the significance level as 0.000 \leq 0.05 and the amount of the contribution was 21.43%.

Keywords: teachers’ competence, learning outcome, lathe practice

1 Introduction

The vocational education is closely related to the fulfillment of labor according to the type of mastered skills. \cite{1} The vocational education is secondary education which prepares students primarily to work in certain fields. The statement above explains that the purpose of vocational education is to produce labor force with competence in certain fields.

Vocational High School (VHS) is a form of school that is equipped with workshop and laboratory practices. Therefore, the practical activities in VHS are inseparable from the use of various facilities and infrastructure to support the learning activities. Referring to the aim of VHS to create graduates who are able to meet the needs of the mid-level labor force in accordance with their competencies, then the VHS must be able to provide the practice facilities related to the competencies that will be achieved.

The vocational education will be efficient if the student learning environment is a replica of the actual workplace. The vocational education will be effective if it is provided using the same methods, equipment and machinery that are needed at work. \cite{2} stated that: “Laboratory facilities for vocational-technical courses must provide the best possible match with industrial equipment, materials, work practices, and standards.” This statement explains that the used laboratory facilities in VHS such as equipment, materials, work practices, and standards must be matched with the industrial environment. Laboratory facilities that are suitable for the industrial environment have the aim that students are accustomed to work with the actual work situations.
There are three fundamental areas of facilities planning: physical plant, equipment selection, and equipment organization.” [3] the minimum standard of facilities and infrastructure that must be met by every major in VHS. Every Vocational School should meet the minimum standards that have been set so that learning activities can be carried out properly.

[4] that every education unit shall have infrastructure such as land, classroom, education unit head room, educator room, administration room, library, laboratory, workshop, production unit room, canteen, power installation and service, exercise room, prayer room, playground, creative room, and other place/ room required to support the regular and sustainable learning process. From this statement can be concluded that every education unit shall have facilities and infrastructure required to support the regular and sustainable learning process. The study result of [5] Asri stated that there is significant impact from the facilities completeness to the student’s practical learning outcome. So that with the fulfillment of facilities and infrastructure completeness will give positive effect for the student’s success in obtaining the sufficient information, knowledge and skill.

The facilities completeness in a workshop must be supported by the facilities and infrastructure management itself. The understanding about workshop and leadership management from the teacher and technician is very important as a part of workshop manager. [2] the administration tasks related to the learning and laboratory program implementation. The tasks must be understood well by the vocational teacher. The vocational teacher as the head of workshop and educator must have the knowledge about the learning program and laboratory management so that they will be able to give instruction to the technician and students in teaching and managing the laboratory well. [2] also mentioned that the productive teacher manages the workshop and runs the program in the learning activity. Based on the statement above can be concluded that the productive teacher must master the knowledge to manage the workshop and run the program in the practical learning activity.

Teacher as the educator shall have several requirements. The requirements as [6] the teacher’s work achievement standard in performing the professional task, the teacher shall prepare the lesson plan, perform the teaching process which is qualified and assess and evaluate the learning outcome.

The quality of education and graduation is often considered to depend on the role of the teacher in managing the teaching components used in the teaching and learning process. Teacher’s competence improvement is expected to have an effect in improving the quality of HR output produced in the education process. The teacher must possess and display maximum competence during the learning activities by adjusting the development of science and technology. [7] stated that the teacher is a professional educator with the main task to educate, teach, guide, lead, train, assess and evaluate the students in the formal education, elementary education and secondary education. The teacher shall possess the ability or competence about the material widely and deeply in this case including the mastery of other academic ability which acts as the professionalism of the teacher.

2 Methods

This study was an ex-post facto study because it did not give treatment or manipulation to the study variable. This study exposed the fact based on the indications happened to the previous respondent. The ex-post facto study was included to the correlational study type because aimed to figure out the impact of related variable to a studied object or subject. This study was
quantitative where the studied indication was measured using the numbers so that the statistics analysis technique for processing the data.

The analysis step used in this study by using the regression analysis started by analysis precondition test and hypothesis test in the regression analysis. The hypothesis test started by determining the line equation:

\[ Y = a + b_1X_1 \]

where:

- \( Y \) = criterion
- \( X_1 \) = predictor
- \( a \) = constant
- \( b_1 \) = coefficient of predictor 1

then looked for the correlation of the independent variable to the dependent variable. The correlation coefficient was used to calculate the coefficient of determination so that the magnitude of the influence of the independent variable on the dependent variable was known.

3 Findings

The data was collected by closed questionnaire. From the analysis result it was known that the maximum value of the teacher’s competence variable was 79 and the minimum value was 44. From the calculation obtained that the average value (Mean) was 64.3719, mode (M) was 61, Median (Me) was 64, and the Standard Deviation was 6.50151.

The obtained data needed to determine the amount of interval class so that could be easier to be tabulated. The method used to determine the interval class amount was formulation \( K = 1 + 3.3 \log n \), so that obtained the mathematics equation \( K = 1 + 3.3 \log 285 = 9.1 \) rounded become 9, while to determine the class length conducted by finding the data range by reducing the maximum score with the minimum score and then added by 1, \( RD = (79 - 44) + 1 = 36 \). The class length can be found by dividing the data range with total class \( = RD : K = 36 : 9 = 4 \).

![Histogram of Teacher’s Competence](image)

Based on the histogram above about the frequency of teacher’s competence of VHS in Kebumen Regency the most frequency was in interval class 60 – 63 as 88 persons.
On the variable of student practical learning outcome obtained the analysis result data in the form of maximum score of the lathe practice learning achievement of the VHS students in Kebumen Regency was 95 and the minimum score was 63. Based on the calculation obtained the average (Mean) score as 81.5, Mode (Mo) as 83, median (Me) as 81.5, and the Standard Deviation was 6.73780.

From the obtained data, it was needed to determine the interval class amount so that it could be easier to be tabulated. Determined the interval class amount by using the formula \( K = 1 + 3.3 \log n \), so that obtained the mathematical equation \( K = 1 + 3.3 \log 285 = 9.1 \) which was rounded become 9, while to determine the class length conducted by finding the data range by reducing the maximum score with the minimum score and then added by 1, \( RD = (\text{maximum} - \text{minimum}) + 1 = (95 - 63) + 1 = 33 \). The class length can be found by dividing the data range with total class \( RD : K = 33 : 9 = 3.67 \) which was rounded become 4.

![Histogram of Student’s Lathe Practice Learning Outcome](image.png)

Based on the histogram above about the frequency of teacher’s competence of VHS in Kebumen Regency the most frequency was in the interval class 79 – 82 as 69 persons. Before the hypothesis test was conducted by the used analysis technique, there were requirements that must be fulfilled, such as the score distribution must be normal and the relation of independent variable and dependent variable was a linear relation.

The calculation result of normality test can be seen on Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Kolmogorov-Smirnov</th>
<th>p</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teacher’s Competence (X1)</td>
<td>1.185</td>
<td>0.061</td>
<td>Normal</td>
</tr>
<tr>
<td>2.</td>
<td>Lathe Practice Learning Outcome (Y)</td>
<td>1.185</td>
<td>0.143</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Based on the normality test result above can be concluded that the variable of facility completeness competence, workshop management, teacher’s competence, and lathe practice learning outcome has data distribution with normal distribution. This case was proved by the probability in all variables had \( p \) calculate > \( p \) critical score (0.05).
Table 2. Summary of Linearity Test Result

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>F calculate</th>
<th>Significance (p)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X1 and Y</td>
<td>0.891</td>
<td>0.637</td>
<td>Linear</td>
</tr>
</tbody>
</table>

The decision making for this linearity test was by consulted the probability of p calculate score with p critical (0.05). If the p calculate score > p critical, then the relation pattern of each variable was linear. Based on the linearity test result on the table above can be concluded that the relation between independent variable and dependent variable has linear relation. It cause by the p calculate score > p critical.

The hypothesis test was conducted by regression analysis. The naught hypothesis (Ho) need to be submitted before the statistics analysis was conducted for the alternative hypothesis verification (Ha). Ho or naught hypothesis of this study was there is not significant impact from the teacher’s competence to the lathe practice learning outcome of VHS students. The hypothesis test used regression analysis with the assistance of SPSS software. The decision was taken from the significance score of t-test score. The Ha acceptance guideline that was the t-test significance score ≤ 0.05. Table 3 below presented the data of hypothesis test result in this study.

Table 3. Summary of Hypothesis Test Result

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>R</th>
<th>R2</th>
<th>t-test</th>
<th>Significance of t-test</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X1 to Y</td>
<td>0.487</td>
<td>0.237169</td>
<td>4.404</td>
<td>0.000</td>
<td>Ha accepted</td>
</tr>
</tbody>
</table>

Based on the result above the significance score was under 0.05 in the rejection area of Ho. Therefore it can be concluded that Ho was rejected while Ha was accepted that there was a significant impact on the teacher’s competency to the lathe practice learning outcome. This hypothesis conclusion was attested where the significance was 0.000 ≤ 0.05.

4 Discussion

The regression line equation from this study was:

\[ Y = 29.861 + 0.252 X1 \]

It implied that if the teacher’s competence was increased as 1 point then the lathe practice learning outcome would increase as 0.252 point. The meaning of the regression analysis result above showed that the higher the teacher’s competency, the better the lathe practice learning outcome. It signified that there was significant impact on the teacher’s competence to the lathe practice learning outcome.

The amount of contribution of workshop management was showed by the result of determination coefficient calculation (R2). From the analysis result it was known that R2 score as 0.237169. It implied that the variable of teacher’s competence gave contribution to the improvement of lathe practice learning outcome of VHS students in Kebumen Regency. It was in line with the statement of [8] (1) teacher’s competence as a criteria of teacher recruitment, (2) teacher’s competence is important in order to teacher’s development, (3) teacher’s competence is important in order to curriculum planning, (4) teacher’s competence is important in the relation with the student’s learning activity and outcome.

The variable of teacher’s competence had significant impact to the lathe practice learning outcome. It happened because the teacher as learning activity organizer had important role in delivering the learning materials. The teachers who had special expertise would be able to educate, teach, guide, lead, train, assess and evaluate the students and had authority as well as responsibility to their students. In the fourth point of the above paragraph it was explained that
the teacher’s competence was important in the relation with the students’ learning activity and outcome.

The result of the study showed that the variable of teacher’s competence had contribution as 23.71%. The contribution number as 23.71% was considered as small number. It happened because the productive teacher possessed by most of the private school as the subject of the study were not suitable to the qualification of productive teacher of Machinery Engineering.

Considering the importance of teacher’s competence in improving the lathe practice learning outcome quality, then the stakeholders of VHS in Kebumen Regency must have high level of awareness to improve the Machinery Engineering teacher’s competence. The teacher’s competence has been proven to be able to improve the students’ learning outcome in lathe practice learning outcome significantly. Therefore the school party need to take the steps which could improve the teacher’s competence existed in each school.

The steps that can be taken by schools are by recruiting teachers and technicians according to their qualifications. Moreover, by sending Machinery Engineering teachers to attend the training and education program to improve their competence.

References

Analysis Of Satisfaction Of Regional Device Organizations To Interest And Performance Levels In Watering Development Projects In Semarang City

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Abstract. The quality of service produced by service providers can be used to measure customer satisfaction, which is based on performance generated by service providers and the assessed interests of customers. Customer satisfaction is very important to measure because it greatly affects the loyalty of a company / service provider. From the analysis of the research results obtained the level of satisfaction of the Regional Apparatus Organization for irrigation buildings with the suitability level method showed an average yield of 94.41% means that the OPD was not satisfied with the performance produced by the service provider and the gap analysis showed a negative gap meaning the customer felt his expectations were not in accordance with the fact. Meanwhile, using the Importance Performance Analysis (IPA) method based on the Cartesian diagram, the accuracy of payments to subcontractors, the absence of remaining work discharges left after the project ends, focus on quality and reduce repairs, OPD implementation and construction safety, and the provision of OPD personnel and others are the main priority which needs to be improved again and with the Customer Satisfaction Index (CSI) included in the category of "satisfied" with the work done by service providers/contractors with a percentage of 82.66%. The conditions of the three analyzes only apply to the implementation of the irrigation building project in the City of Semarang, in the range of 2017-2018 and with an average difference in bid prices to the estimated prices themselves of 11.57%.

Keywords: Satisfaction, Conformity Level, IPA, and CSI.

1 Introduction

The national development process is closely related to building construction. Construction services will realize a development process in the form of a building or other physical form which is in the process of being implemented in the form of a construction project. Construction services will realize a development process in the form of buildings and other physical forms. Before the implementation of a project is carried out, the Regional Apparatus Organization (OPD) of budget users/goods users/service users will first select a contractor through the Procurement Service Unit/Election Working Group.

In general, the parties involved in a construction project are the project owner / owner and service providers / contractors. The owner here is the Regional Apparatus Organization (OPD) or the previous term Regional Apparatus Work Unit (SKPD) is an organization / institution in the regional government that is responsible to the regional head in the framework of...
administering government which consists of the regional secretariat, regional offices, regional technical institutions, districts, and others.

Auction is an activity that aims to select, obtain, determine and appoint the most suitable company to work on a work package [1]. This auction activity is a place for construction service providers to compete for a project. Auctions usually set prices with various considerations in order to win the project. Prior to the auction, there will be an Own Offer Price which has been set by the Commitment Making Officer (PPK) and at the time of the auction process, the Bid Price given by the contractor will appear. This process will cause the difference between the bid price and the estimated price itself.

Data from the Semarang Electronic Procurement Service (LPSE) from the 2017-2018 fiscal year auctioned 21 types of work packages for irrigation building projects. From the calculation of the data, new data will appear, namely the difference in the bid price against the self-estimated price for each job.

According to Kotler [2] quality services have an important role in shaping satisfaction. Satisfaction is a customer response as a result and evaluation of performance discrepancies or perceived actions as a result of not meeting expectations [3]. Service user satisfaction can be seen when comparing their expectations based on the reality they get. Satisfaction can also be seen based on the Satisfaction of the Equipment Organization very much needs to be considered because of the satisfaction generated from service users as a measure of loyalty to the service provider. If the regional apparatus organization is satisfied / their hopes are fulfilled, they will reuse the service provider, and vice versa, if the sub-village service user will not reuse the service provider. Loyalty increases, the use of repeated products will also increase, so that the profit generated will also increase. This means that the higher the loyalty of service users, the higher the level of company profits [4]. Seeing from this background, the main issues that became the material of the author's study in this study were: Analysis of the Satisfaction Level of Regional Apparatus Organizations on the Level of Interest and Level of Performance in Irrigation Building Projects in the City of Semarang.

2 Research Methods

the research is from Semarang City Electronic Procurement Service (LPSE) data for 2017-2018 with 21 packages of irrigation building construction work, overseen by eleven work units / Regional Apparatus Organizations (OPD) which are located in several Dinas in Semarang, the Environmental Service, the Fisheries Service and the Health Service.

This type of research is quantitative. Quantitative research [5] is research by obtaining numerical data or qualitative data which is extrapolated by survey studies. Survey study is one research approach that is generally used for extensive and large data collection [6].

Data analysis techniques using the Customer Satisfaction Index (CSI). CSI is an index to determine the overall level of customer satisfaction with an approach that considers the importance of the attributes being measured [7]. According to Statfor (in Madeppungeng [8]) the calculation phase of the Customer Satisfaction Index (CSI) is as follows:

a. Calculate the mean important score (MIS) for all project management performance evaluation variables and add them up (Total MIS)
b. Calculating the weight of importance factor (WF) from the mean value of importance level (MIS) to a percentage number of the total mean value of the level of importance (Total MIS), so that the total weight importance factor (WF) is obtained 100%.

c. Calculating the weighted score (WS), which is the multiplication weight of the WF with the mean satisfaction score (MSS) for each variable

d. Calculating the total weighted average (WAT), namely adding up the weighted score (WS) of all variables

e. Calculating the Customer Satisfaction Index (CSI), namely the total weighted average (WAT) divided by the high scale (HS), the maximum scale used (rating scale 5)

3 Results and Discussion

The level of conformity is the comparison between the performance appraisal score and the customer importance score. Thus, based on the above results, the average number obtained from the 15 indicators used to find the level of suitability is 94.41%, in other words, the level of suitability has not reached / less than 100%. That is, these 15 indicators have a lower performance value than their importance, the results of research conducted by Prabowo (2017) also state that the level of performance is generally still below the level of importance, in other words the results of research conducted in this study have results, something similar. The figure of 91.41% shows that the Regional Apparatus Organization (OPD) is not satisfied with the performance produced by service providers and assesses that the performance shown is not yet proportional to the level of importance. Overall for the 15 indicators the average gap value is -0.25, so including the negative gap classification with the level of customer satisfaction is less satisfied than expectations. This gap occurs because the expectations of customers / service users are higher than accepted reality. However, these conditions indicate that the results of the suitability level of 94.41% were assessed by the OPD in the implementation of irrigation building project work in the city of Semarang in the 2017-2018 period and with the difference in the average difference between the bid price and the estimated price was 11.57%.

Important Performance Analysis (IPA) is used to determine the distribution of each aspect used in measuring service quality, which is presented in diagrams and divided into 4 quadrants. For (quadrant I) itself, there are 5 criteria that must be continuously improved by service providers so that this quadrant can increase optimally / towards a good quadrant (quadrant II). Then for round II there are 11 criteria, which means that the criteria that have been included in this quadrant must be maintained because these criteria are good according to service users. For (quadrant III) there are 12 criteria for which these criteria can be considered for improvement even though in fact / according to service users they are deemed less important, and (quadrant IV) there are 9 criteria in which these criteria are also considered less important by users but their performance is very good, for Quadrant IV it is hoped that service providers can reduce the excessive performance. From these conditions it can be indicated that the results of the distribution of the criteria in the IPA Cartesian diagram for the implementation of irrigation building project work in the city of Semarang which are used to determine the factors that affect the level of satisfaction, only apply in the 2017-2018 range and with an average difference, the difference between the bid price and the estimated price was 11.57%.

This service user satisfaction is related to the quality of service that has been carried out by service providers / contractors in completing work projects. OPD measures this satisfaction
Based on the indicators previously described. Thus, based on the above results, the satisfaction rate obtained from the 15 indicators is 82.66%, in other words, this figure falls into the satisfied category. This shows that the Regional Apparatus Organization (OPD) is satisfied with the performance produced by service providers. Similar research has also been conducted by Syahroni and Siswoyo [9], namely the Analysis of Owner Satisfaction on Contractor Performance at the Public Works and Spatial Planning Office of Lumajang Regency, the results of their research from CSI show a figure of 66.32% and fall into the satisfied category. It can be said that the results of this study and the research conducted by Syahroni and Siswoyo [9] have similar results, namely that customers are equally satisfied with the performance produced by service providers. The results of the satisfaction score obtained from the CSI calculation will increase by 100% if by making improvements to aspects of the results of the science diagram. Performance evaluation can be seen from the level of performance and the level of importance of the aspects used to measure service quality. From this evaluation, it was found which aspects of the service would be improved, maintained or their performance reduced. However, this condition indicates that the results of the satisfaction level assessed by the OPD are 82.66% on the 15 indicators used as criteria in measuring OPD satisfaction in the implementation of irrigation construction project work in the city of Semarang in 2017-2018.

4 Conclusion

Based on the research results that have been discussed in the analysis of research results, the following conclusions can be drawn:

a. The level of suitability between performance and the importance of the satisfaction of the Regional Apparatus Organization based on the 15 indicators used to find satisfaction shows an average result of 94.41%, meaning that the regional apparatus organization is not satisfied with the performance produced by the service provider and assesses that the performance is not proportional to the level of importance and the gap results in a negative value meaning that the customer feels less satisfied between reality and his expectations. However, this condition only applies to the implementation of irrigation building projects in Semarang City, in the 2017-2018 period and with the difference in the average difference between the bid price and the estimated price itself of 11.57%.

b. The relationship between the level of importance and the level of performance on organizational satisfaction based on the Cartesian diagram is, (quadrant I) itself there are 5 criteria that are the main priority for improvement so that it can be in a good quadrant (quadrant II). Then for quadrant II there are 11 criteria, which means that they must be maintained because these criteria are good according to service users. Kudran III there are 12 criteria for which these criteria can be considered for improvement even though in reality / according to service users they feel less important, and quadrant IV there are 9 criteria where these criteria are also considered less important by the user but the performance is very good, for Quadrant IV it is hoped that service providers can reduce the excessive performance. However, this condition only applies to the implementation of irrigation building projects in Semarang City, in the 2017-2018 period and with the difference in the average difference between the bid price and the estimated price itself of 11.57%.

c. The level of satisfaction of the Regional Apparatus Organization produced by service providers based on the results of the Customer Satisfaction Index (CSI) as a whole indicator
is 82.66%, this figure is included in the satisfied category. The performance satisfaction results obtained from the CSI calculation will increase 100% if improvements / evaluations are made on aspects based on the Natural Science Cartesian diagram. This shows that the regional apparatus organization is satisfied with the performance produced by service providers. However, this condition only applies to the implementation of irrigation building projects in Semarang City, in the 2017-2018 period and with the difference in the average difference between the bid price and the estimated price itself of 11.57%.

References

The Influence of Information Technology Utilization And Implementation Of Class Supervision Toward The Performance Of State Vocational High School In Kabupaten Tegal

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Abstract. This research aims to determine: (1) the influence of information technology utilization toward the teachers’ performance; (2) the influence of implementation of class supervision toward the teachers’ performance; (3) the simultaneous influence of information technology utilization and implementation of class supervision toward the performance of state vocational high school teachers in Kabupaten Tegal. This research is a descriptive statistical study carried out in seven vocational high school with state-labelled in Kabupaten Tegal. The sampling technique used is random sampling, from a total population of 580 people taken as many as 10% - 15% of people refer to the theory. The instrument and reliability validity are tested using the IBM SPSS v18 program. The results show that: (1) there is a positive and significant influence of information technology utilization on teacher performance; (2) there is a positive and significant influence on the implementation of class supervision on teacher performance; (3) information technology utilization and the implementation of class supervision give simultaneous influence toward the performance of state vocational high school teachers in Kabupaten Tegal.

Keywords: Information technology, Class supervision, Teacher performance.

1 Introduction

The progress level of a country can be seen from the educational sector. Good quality of education in a country can yield a generation of the superior nation to compete in the global era. National education is one of the parts of the development sector of human resource quality whose vision to create a strong and authoritative educational system. Various efforts continue to be made by the Government to improve the quality of education by implementing an educational system that
has clear and mature objectives. The goal is to empower Indonesian citizens to develop a quality and competitive human being so as to answer the challenges of an increasingly complex era.

In addition to the central functions of educational purposes, it turns out that the development of information and technology develops very rapidly. That development has been presenting its own challenges, where the acceleration of technology occurs very rapidly across time and sometimes not followed by the increase in the ability to utilize it, hence the utilization of technology in learning is one of the pedagogic competencies that teachers must have. Teachers are required to be at the forefront of technology mastery as the absolute acceleration form must be transferred to the succeeding generation. It is to avoid the gap between teacher and students knowledge.

It seems that the use of information technology in the educational world does not always run smoothly, because technological advances are not always followed by the quality of human resources. It is in line with what Bonita Destiana put forward, she conveys the bottom of aligning the technological advances and the quality of teachers is still difficult because most teachers are still accustomed to the old methods in the learning process, namely a method of lecture that is based on content to complete the material, while schools have a means and support infrastructure for learning technology-driven information such as computer laboratories, LCD projector and Internet access.

In addition to realizing a good teaching performance for teachers, there must be supervision activities as efforts to provide assistance and services to improve the quality of teaching teachers in the classroom as a form of developing the potential and quality of teachers [13]. Improving the quality of learning and professionalism of teachers in their performance is closely related to the effectiveness of supervision services. The headmaster becomes an instructional leader to maintain and improve the quality of effective and efficient learning as Eben Egwu said \textit{“The principal as an instructional leader is responsible for maintaining and improving. The quality of instructional programmes for the effective and efficient attainment of the set educational objectives of the school”} [6].

In terms of its own implementation, there are obstacles faced in the classroom supervision. Such constraints may come from within the principal in the form of the complexities of the school principal, whose supervision duties cannot be performed by the principal, which can not be done on their own to be resolved by Delegation of authority by the headmaster to the vice principals or senior teachers. In addition, supervision problems also occur in the teachers themselves in the form of lack of supervised teachers, which means that the motivation for teachers to be supervised is still lacking. This is because there is still a strong assumption from teachers that the mere supervision is merely an activity to fault-finding.

\section*{2 Literature review}

The research aims to determine the influence of information technology and implementation of the class supervision on teacher performance. As for some previous researches that became a reference in this research, examined the influence of the utilization of information technology on the quality of student service at the Faculty of Engineering, University of Majalengka. The results of the study proved that there is influence on the utilization of information technology to service
quality. [12] examined the influence of information technology on the teachers’ profession. Using linear regression calculations, the study revealed that the factors defined were affecting the teachers in using IT in their profession assignments as teachers. This research was conducted in Kebumen regency.

[4] examined the teacher's perception of the implementation of the teaching supervision by the headmaster at SMP N Kecamatan Lareh Sago. The study concluded that the teacher's perception of supervision by the principal was positive. [11], a thesis study in SMA Negri Sekota Magelang, aims to uncover the influence of class visits and the efficacy of teacher performance and learning achievement. This research showed the results that learning achievements are influenced simultaneously by class visit supervision, teacher competence and teacher performance.

The utilization of Information technology (IT) to support the various needs and development of the organization [2], individuals and companies will certainly bring something positive. No exception to its utilization in the world of education, the exchange of information between fellow teachers, fellow students, and between teachers and students become more effective with the help of information technology. The utilization of this information technology will certainly help to improve the performance of teachers in school. Thus it can be taken hypotheses in this study that the use of information technology variables has a significant influence on the teacher's performance. With sufficient knowledge and the maximum use of information technology, teacher work will be assisted both inside and outside the teaching and learning activities.

Supervision is a series of activities to help teachers develop their ability to manage the learning process to achieve learning objectives. The quality of improvement efforts of teachers through supervision are expected to improve the quality of student learning outcomes. The teacher's performance assessment in supervision is to look at the real condition of the teacher's performance to answer questions, such as what teachers do in the classroom, what are the advantages and disadvantages of teachers in implementing the learning process and so on. Based on answers to these questions, it will get information about the teacher's ability to manage learning. It can be taken the hypothesis that the supervision performed by the headmaster has a major influence on teacher performance. The improvement on teacher performance indirectly affects students achievements as well. Because good teachers performance can be seen from the results obtained from the students assessment or achievement.

Based on the research framework above, the presence of information technology and the role of headmaster as a supervisor greatly affects the results of teacher performance. This means that the three components above are interconnected with each other in achieving the learning objectives. To make it easier to understand the framework, the researcher presents them in the form of a paradigm image:
3 Research methods

3.1. Date and time

The research was conducted on October 16th until November 5th 2019. While the research place is implemented in all of state vocational high schools in Kabupaten Tegal, Central Java.

3.2. Research type

This research is a descriptive statistical study with a quantitative approach. The purpose of descriptive research is to represent/describe what variables/conditions are in a situation.

3.3. Research subject

Samples are partial or representatives of the population studied [1]. The samples used in this study is random sampling. A random sampling is a sampling technique by mixing subjects-regardless of levels in the population. If the research population amounts to less than 100 then the samples taken are all. But if the research population amounted to more than 100 then samples can be taken between 10% to 15%, or 20% to 25% of the total population.

Here are the data of the schools and the number of teachers of State Vocational High Schools in Kabupaten Tegal:

<table>
<thead>
<tr>
<th>School name</th>
<th>Number of teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMK Negeri 1 Bumijawa</td>
<td>62</td>
</tr>
<tr>
<td>SMK Negeri 1 Slawi</td>
<td>89</td>
</tr>
</tbody>
</table>
So in this research, the researcher took a sample number of 75, because it is already qualified sample that can be taken i.e. 58 up to 87 people.

3.4. Technique of Data Collection

Technique of data collection is the way to obtain data in research. Questionnaire or poll is a technique of data collection done by giving a set of questions or written statements to the respondent to be answered. Questionnaires are efficient data collection techniques when researchers know exactly which variables are measured and know what to expect from respondents [9].

<table>
<thead>
<tr>
<th>Table 2. Respondent's response rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
<tr>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>Less Agree</td>
</tr>
<tr>
<td>Disagree</td>
</tr>
</tbody>
</table>

3.5. Instrument Validity and Reliability

In order to acquire a valid instrument, the researcher creates question item on each indicator of each variable. Testing the validity of the instrument on this study using the help of the SPSS series 18 software program, according to [14] by conducting bivariate correlation between each indicator score and the total number of construction scores. Instruments are said to be valid if the significance value of the instrument item score (Sig 2 tailed) is < 0.05.

Based on the test of instruments conducted to 30 teachers of SMK Negeri in Kabupaten Tegal as many as 53 statements divided into two free variables and one bound variable. Here are the validity test results based on each variable. From 53 statements, there are 5 invalid statements. Hence the statement that can be used to obtain data in this study is as much as 48 items.

The reliability test according to Wahyudin (2015) is a test conducted to detect whether a poll or questionnaire as a research variable measuring instrument, has provided consistent measurement results or tests over time. A questionnaire is said to be religious or reliable if a person's answer to the statement is consistent or stable from time to time. Reliability measurements can be done in two ways with repeated measure or re-scrolling and one shot or once only measurement [14].

Researchers in this study used one shot reliability measurements or once measurements. This measurement is done only once and then the result is compared to other questions or measuring correlation between questions answers. The reliability test in this study used IBM SPSS Statistic 18. [14] says that SPSS provides the facility to measure the reliability with the Cronbach Alpha (α).
statistical test, where a variable is said to be reliable if it delivers a Cronbach Alpha (α) value of > 0.70. The results of the instrument reliability can be seen in table 3 as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Utilization</td>
<td>0.827</td>
</tr>
<tr>
<td>Classroom Supervision</td>
<td>0.890</td>
</tr>
<tr>
<td>Teacher Performance</td>
<td>0.820</td>
</tr>
</tbody>
</table>

### 4 Result and discussion

#### 4.1. Descriptive statistical analysis

The three research variables, i.e. utilization of information technology, the implementation of class supervision, and the performance of teachers are measured using a method of questionnaire. This research uses the help of IBM SPSS v21 which obtain descriptive statistical results as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization of Information Technology</td>
<td>59.72</td>
</tr>
<tr>
<td>Implementation of Class Supervision</td>
<td>53.67</td>
</tr>
<tr>
<td>Teacher Performance</td>
<td>46.15</td>
</tr>
</tbody>
</table>

Based on the average calculation results of 75 samples of teachers toward 18 statements that measured the variable X1, 16 statements for measuring X2 and 14 statements to measure X3, that can be known as a whole teachers of SMK Negeri in Kabupaten Tegal are classified into teachers with the utilization of information technology of 59.72 which belongs to the very high category, 53.67 is a very high category for the influence of class supervision on teachers and 46.15 for the performance of teachers also include as very high category as well.

#### 4.2. Normality test

Normality test is used to test whether in regression model, the residual variables have a normal distribution or not. A normality test can be carried out using the non-parametric Kolmogrov-Smirnov statistical test. The magnitude of the value of Kolmogrov-Smirnov the performance of the teacher as a bound variable is 0.633 and significant at 0.818 whose value is above 0.05. So it can be said that residual data with the teacher's performance as a bound variable is normal distribution.

#### 4.3. Linearity test
The linearity test is used to determine whether the specifications of the model used are correct or incorrect. Test results can be seen in the following table:

<table>
<thead>
<tr>
<th>Variable</th>
<th>sig. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 against Y</td>
<td>0.754</td>
</tr>
<tr>
<td>X2 against Y</td>
<td>0.969</td>
</tr>
</tbody>
</table>

Based on the linearity test result on the table output "ANOVA Table" above, it is revealed that the value of Sig. Deviation From Linearity amounted to 0.754 X1 against Y, and 0.969 X2 against Y, higher than 0.05. It can then be concluded that there is a significant linear relationship between the utilization variables of information technology (X1) and the implementation of the class supervision (X2) with the performance of the teacher (Y).

4.4. Multicholinerity test

The Multicholinerity test aims to test whether a regression model is found to be correlated among independent variables. Multicholinerity test can be seen from the output of SPSS in the Variance inflation factor (VIF) value and the tolerance value. If the value tolerance > 0.10 or equal to the VIF value of < 10 then it can be inferred not occurring Multicholinerity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.793</td>
<td>1.262</td>
</tr>
<tr>
<td>X2</td>
<td>0.793</td>
<td>1.262</td>
</tr>
</tbody>
</table>

The calculation result of the tolerance value in the table above indicates that the tolerance value in both the independent variable is more than 0.10 (tolerance > 0.10) and the VIF value of < 10. So it can be concluded that there is no symptom of multicolonierity in the regression model used.

4.5. Heteroscedasticity test

Heteroskedasticities test is aimed at testing whether the regression model occurred variance inequality of the residual one observation to another observation [14]. Testing conducted with Test Park, by looking at the coefficients table when the parameter coefficient for independent variables is not significant or > 0.05, there are no Heteroskedasticities [14].

<table>
<thead>
<tr>
<th>Variable</th>
<th>sig. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.984</td>
</tr>
<tr>
<td>X2</td>
<td>0.196</td>
</tr>
</tbody>
</table>
According to the table above, it can be known the significance value in each variable > 0.05. It can be concluded that the regression model used does not contain Heteroskedasticity.

### 4.6. Hypothesis test

The hypothesis test results can be seen from the following table:

<table>
<thead>
<tr>
<th>Variable</th>
<th>t/F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>3.512</td>
<td>0.001</td>
</tr>
<tr>
<td>X2</td>
<td>3.076</td>
<td>0.003</td>
</tr>
<tr>
<td>X1 + X2</td>
<td>19.951</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The statistical test result on the utilization of Information technology (X1) variable obtain a value of t calculation = 3.512 with a value of significance = 0.001. While the implementation of class supervision variable (X2) is obtained the value of t calculation = 3.076 with a significance value of 0.003. Hypotheses will be accepted if T<sub>cal</sub> > T<sub>table</sub> or the significance value < Probability that is 0.05 and hypotheses are rejected if the result is otherwise.

Based on the test table above, it can be seen through the significance value of X1 is worth 0.001 < 0.05 and X2 is worth 0.003 < 0.05 then H<sub>a1</sub> and H<sub>a2</sub> are accepted, which means the influence of utilization of information technology variable to the teacher's performance as well as the implementation of the class supervision on the teacher's performance are known.

Based on the output table above, it is known that F<sub>cal</sub> amounted to 19.951 > F<sub>table</sub> 3.12 and significance value 0.000 < 0.05. As the basis of F test decision making if the value of F<sub>cal</sub> > F<sub>table</sub> or significance of < 0.05 then it can be concluded that H<sub>A3</sub> is received, which means that there is the simultaneous influence between the utilization of information technology and the implementation of the class supervision on the teacher's performance.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H&lt;sub&gt;a1&lt;/sub&gt; : there is positive and significant values on the implementation of Information Technology.</td>
<td>Accepted</td>
</tr>
<tr>
<td>H&lt;sub&gt;a2&lt;/sub&gt; : there is positive and significant values on the implementation of classroom supervision on the teacher’s performance</td>
<td>Accepted</td>
</tr>
<tr>
<td>H&lt;sub&gt;a3&lt;/sub&gt; : there is simultaneous influence among the utilization of information technology and the classroom supervision on the teacher performance</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

### 5 Conclusion and suggestion
5.1. Conclusion

Based on the results of the study, it can be concluded as follows:

(1). The utilization of information technology affects positively and significantly to the performance of teachers of state vocational high schools in Tegal regency. The use of information technology that is utilized maximally among state vocational high schools teachers in the district makes the teacher's performance increased in teaching activities in the classroom.

(2). Implementation of class supervision positively and significantly to the performance of teachers of state vocational high schools in Tegal regency. Supervision activities performed by the headmaster to teachers while teaching in the class resulted in an evaluation to assess the ability of teaching teachers. From the evaluation the teacher will try to improve its shortcomings and improve its ability in teaching so that it will impact on the achievement of its performance.

(3). Utilization of information technology and the simultaneous implementation of the class supervision of the teacher's performance. With the utilization of high information technology and the influence of the implementation of class supervision in line, then both simultaneously will affect the performance of teachers as teachers.

5.2. Suggestion

Based on the analysis and results of the discussion, the researcher suggest the following list:

(1). To improve the performance of teachers not only done by utilizing information technology and implementing class supervision only, but need improvement of discipline, creativity, availability of facilities and appreciation to the achievement accomplished by the teacher.

(2). It is good that the school is more actively conducting training in the utilization of information technology for teachers, so that the facilities that have been available in school can be utilized to the fullest.

(3). The intensity of the supervision of the class that has been running is maintained, even in improving the quality so that the teacher's performance is better again.

(4). For schools are expected to add computer and Internet facilities as part of information technology, in order to improve the performance of teachers, also expected to influence students’ learning achievement.

(5). Subsequent studies are expected to expand the research object by researching intermediate primary education or even college education. It is expected to add variables or use other variables that can affect the performance of a teacher.
References


Management Model on Industrial-Class Vocational Boarding Schools (Pesantren) to Develop Graduates with Character and Competence

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Abstract. The research aims to finding a management model on industrial-class vocational boarding school used project-based and teaching-collaboration learning; increase character and competence students of vocational high schools based on Pesantren; Improving student competency vocational high schools based on Pesantren. The research method used is Research and Development. The research subjects of SMK Roudlotul Mubitadiin Balekambang, Jepara, Indonesia in the competence of Computer Network Engineering (CNE) and Audio-Video Engineering (AVE). This article found that in learning in vocational competencies of different skills but still in the same field of science clumps can be carried along by using project-based learning and teaching-collaboration learning. Project-based learning can enhance the industrial character (critical thinking, creativity, collaboration, and communication). Competency improvement includes computer and basic network, broad-based network technology, computer systems, basic programming, workbenches, engineering drawing; basic electrical and electronics. The study is limited to the competence of Computer Network Engineering (CNE) and Audio-Video Engineering (AVE) on vocational boarding schools based on Pesantren. Collaboration allows other competency skills in a clump of different sciences but in the same school. Need research on a regular vocational high school.

Keywords Management model, Characters, Boarding school, Teaching-collaboration, Project-based learning.

1 Introduction

The Government has made efforts to improve the education system through the revitalization of Vocational High School (VHS). Revitalization of Interest VHS follows Instruction number 9, 2016. The Minister of Education and Culture instructs to enhance and harmonize the vocational curriculum by with the requirements of competence of graduates so that graduates have the knowledge or competitive attitudes. Besides, with the revitalization of VHS is to change the paradigm that was once only encountered to develop graduates without regard to labor market needs to change the paradigm of searching for anything related to the labor market from working culture
and competencies required in the labor market, changing the learning of supply-driven to demand-driven, setting up vocational graduates adaptable to changes in the world (Hendarman, et al, 2016).

One of VHS-based boarding school is VHS Roudlotul Mubtadiin Balekambang, Jepara. Pesantren is an institution that can be said is a form of the natural process of development of the national education system. Pesantren education institutions have a strategic position in the world of education in Indonesia. As one form of education, schools have a special place in front of the public. This is because schools have greatly contributed to the life of the nation and the cultural development of society (Mas’udi, 2015).

The school's vision is to become a superior educational institution, creative, innovative, global perspective and character with the teachings of Islam rest on the style of Ahlus Sunnah Wal Jama'ah. A school will be able to achieve the vision, mission, and purpose if all components of the school can run the respective roles well. So is the role of a teacher.

Teachers as educators and employees as educators require any change in the character to fit the needs of students and industry. This is to show the teacher's philosophy obeyed, reliable and replicable example. Teachers in the profession underwent 4 ON should apply: (a) visiON, which means that teachers must set a vision for teaching; (b) actiON, which means that teachers must move with the learning method of interactive and fun; (c) passiON, which means that teachers have to work with the heart; (d) CollaboratiON, which means that teachers must establish collaboration with the industry.

Along with achieving these educational goals, the teacher as an educator has an important role in it. Based on interviews with the Principal of SMK Roudlotul Mubtadiin Balekambang, there is a lack of human resources (HR) for teachers. The lack of teacher's human resources will certainly hinder the process of achieving educational goals that have been set previously.

From the data taken using a questionnaire that vocational students' learning motivation Mubtadiin Roudlotul is fairly low. the learning motivation of boarding school-based vocational students the first is religion (akhlaq) 66%, the second is learning 14%, work 6%, coercion 6%, and the other 2%.

In an essence graduates of vocational students should be absorbed into the industry. However, because vocational schools based Mubtadiin Roudlotul, industrial culture is still low even less applied in the schools.

The characteristics that now includes: kind, humble, disciplined, no smoking, lazy, arrogant, polite, patient, diligent, honest, confident, thriving, thrifty, wise, communicative, smart, naughty, creative, assertive, independent, socialist, responsible, cool, hard work, innovative. Having analyzed the existing main character researchers reduction into characters. The existing conditions of the students' characters are disciplined 41%, honest 20%, lazy 12%, patient and independent 6%, communicative smart and naughty 4%, and others 3%

Skills students to communicate, collaborate, think critically and creatively in Indonesia is still less competent and that they should continue to do so improved, especially for science subjects (Zubaidah, 2016; Saputri et al., 2017; Siswanto et al., 2014; Pratiwi and Muslims, 2016; Yuliati, 2017). Skills someone a person can influence the success and success in work.

In addition to a lack of human resources and low motivation of students, to improve student learning outcomes need to be a medium of learning in the learning process. During this learning, media availability is still low for the students to carry on the eyes learning productive practices. Study result in less than the maximum.
We have now entered the era of industrial 4.0, where education has a new challenge, namely the character and competence. 4.0 industrial character needs in this course should be a concern on the part of graduates of vocational schools to be able to follow the development of the era. The skills required for Industry 4.0 are many and varied. Characteristics of the industrial revolution 4.0 is marked by a variety of applied technology (applied technology), as advanced robotics, artificial intelligence, internet of things, virtual and augmented reality, additive manufacturing, as well as distributed manufacturing as a whole is able to change the pattern of production and business models in various industrial sectors.

Four main categories were needed in the industrial era 4.0 (a) technical competence as advanced knowledge, understanding the process, technical skills, etc., (b) the methodological competencies including creativity, entrepreneurial thinking, problem-solving, conflict resolution, decision making, analytical skills, research skills, and orientation efficiency. (c) social competencies such as intercultural skills, language skills, communication skills, networking skills, ability to work in teams, the ability to compromise and cooperate, the ability to transfer knowledge and leadership skills. (c) the personal competencies which include flexibility, ambiguity tolerance, motivation to learn, the ability to work (Leinweber, 2013). The graduate skills gap widely discussed in several studies. Many studies that present how to prepare students to have skills needed in the working world (Yunus and Li, 2005; Andrews and Higson, 2008)

So that learning becomes more efficient, improving the character and skills of students, need to model appropriate learning for maximum results. In this case the use of project-based learning research and teaching collaboration in the learning process in vocational Roudlotul Mubtadiin Balekambang, Jepara.

Based on the problems the purpose of this study is
1. Finding a management model on industrial-class vocational boarding school used project-based and teaching-collaboration learning,
2. Increase character and competence students of vocational high schools based on Pesantren,
3. Improving student competency vocational high schools based on Pesantren.

2 Theoretical background

A vision VHS

Educational purposes related to school vision to be achieved in line with expectations. Vision is the ultimate goal of the school is achieved in the long term. While the mission is the next medium-term objective specified in the usual school goals to be achieved each year school operations (Pratiwi and Muslims, 2016).

A vision of VHS Roudlotul Mubtadiin Balekambang Jepara is Becoming a superior educational institution, creative, innovative, global perspective and character with the teachings of Islam on the style of Ahlus Sunnah Wal Jama’ah. The mission of vocational Roudlotul Mubtadiin Balekambang Jepara include: (a) Providing schools that excel in academic and non-academic; (b) Carrying out the learning process to develop the potential of the learners; (c) Implement educational activities to foster the creativity of learners; (d) Organizing - innovative activities; (e) Implement education
based on the development of character; (f) To prepare graduates who have the entrepreneurial spirit and responsible with the social environment; (g) To prepare graduates who understand and obey the teachings of his religion.

The purpose of the school as part of a national educational goal is to improve the intelligence, knowledge, personality, character, and skills to live independently and to follow further education. In more detail, the purpose of Roudlotul Mubtadiin Balekambang Jepara is as follows (a) To develop graduates who are competent and certified, (b) Improving the quality of competency-based learning and production, (c) Preparing students to be able to develop a professional attitude, adapt to the environment, independent, persevering in competition, disciplined and tenacious, (d) Improving the quality of teachers and professionals, (e) Increase the satisfaction of the community to obtain services appropriate education and vocational training skills program, (f) Be consistent in the implementation of activities, quality control and quality assurance of school, (g) Improving the welfare of the school community.

Industrial Era 4.0 and challenges

In the roadmap Making Indonesia 4.0, one of the program priorities is improving the quality of Human Resources (HR). Therefore, talent is the key or important factor for the success industrial 4.0 implementation. HR is essential to achieve the success of Indonesian Making 4.0. Indonesia plans to overhaul the education curriculum with a greater emphasis on STEAM (Science, Technology, Engineering, the Arts, and Mathematics), aligning the national curriculum to the needs of industry in the future. Indonesia will cooperate with industry and foreign governments to improve the quality of a vocational school while improving global workforce mobility programs to take advantage of the availability of human resources to speed up the transfer capability (Indonesian ministry of industry, 2018).

Character is the key to success (Oemary, 2015) because the character is the main capital and important for the progress of individuals and the nation. Pesantren as one of the institutions that can shape the character of the students. Character education is an investment process essential values in children through a series of learning activities and mentoring to students as individuals capable of understanding, experience, and integrate value into core values in education that lived into his personality. Character education as well as an effort to educate children to make decisions wisely and put it into practice in everyday life, so that they can make a positive contribution to the environment (Kholis, 2012). A nation that has a strong character usually grows and the more advanced and prosperous (Saptono, 2011).

Character Education

Education is one of the factors that determine and influence social change. Through education, it’s expected to produce the next generation has a strong character to receive the baton of leadership of the nation. Unfortunately, many parties considered that such character is actually getting hard to match school students. Many of those involved in the brawl, drugs and so on. Thus sobering circumstances educators to develop character education (Zuhry, 2011).

Character education certainly has a strategy in implementing universally, that is, through the process of the 5 pillars of formation, The first pillar: Moral Acting by way of habituation and culture, Second pillar: teaching knowledge of good values (moral knowing), The third pillar: Moral feeling and loving; Feeling and loving well, Fourth Pillar: Moral Modeling of the Neighborhood, Fifth
Pillar: Repentance of all sins and unprofitable things is possible (even innocent) by performing martyrdom, tahalli, and tajalli (Pratama, 2019).

Early childhood is a critical period for the formation of one's character. The methods of character education in pesantren are: (a) Exemplary Method, (b) Habitual Method, (c) Method of Giving Advice, (d) Motivation Method, (e) Persuasion Method, and (f) Story Method (Nofiaturrrahmah, 2014).

**Competence and Curriculum**

Many research disciplines, such as Psychology, Education, Management, Human Resources Information System has been studying the concept of competency. Various researchers gave different definitions over the years and led to ongoing debates (Deist and Winterton, 2005). In today's educational world of education, competence is required especially when it comes to measuring the output and results of the learning process. In the sense that competence is regarded as keywords in education today (Gagnon, 2009).

The first definition is competence as "the basic characteristics of a person, which results in effective performance and/or excel in the job (Klemp, 1980). Competence basically behavior such as personality or intelligence, and can be taught through learning and development. The Functional approach focuses on competence as a prerequisite to successfully fulfill the task by limiting the time period for the skill competencies and skills required to perform the task (Straka, 2004). Competence as a collection of individual competence required of individuals - and the necessary organizational competencies at the organizational level to achieve the desired results.

Competence is defined as the willingness and ability of the individual to behave in the professional, social, and personal situations in an appropriate manner and considered, and to display individual and social responsibility. Competence to act is displayed in the dimension of professional competence, human competence, and social competence. Furthermore, professional competence describes the readiness and ability, on the basis of specific knowledge and ability to solve tasks and problems in a targeted manner, precise, methodical and independent and to evaluate the results (Straka, 2007; Bukit, 2014). Competence is defined as a description of the skills, knowledge, and attitudes necessary to achieve effective performance in the job. Competence is also made up of personalities, motivations, attitudes, and values (Prosser and Quigley, 1950).

In Asia the education system, there is a belief that rote learning and train students in the academic context to better prepare graduates for the workplace with the performance test are regarded as part of the almost necessary and non-negotiable of education (Teng and Turner, 2018).

In the Industrial Era 4.0 as at present, new skills are needed to face any kind of challenges that exist. There are two types of forms that emphasized skills to face the challenges in the Industrial Era 4.0 ie soft skills and hard skills.

Soft skills are skills or skills related to emotional intelligence, personality, social skills, and communication that characterize a person in interacting with others. Soft skills are required and stressed to face the industrial revolution 4.0 include communication, collaboration, critical thinking, problem-solving, and creativity and innovation (Bakrun, 2015).

Hard skill includes teamwork, project management, leadership, communication, creative thinking, and problem-solving, leading to the development of soft skills (Jones and Iredale, 2010; Fiala et al, 2014; Turner and Mulholland, 2017).
There are three strategies to teach or practice the skills of critical thinking, namely: building categories finding the problem and enhancing the environment (conduciveness environment).

Creativity is a skill to discover, develop, design ideas/creative ideas to produce a product, and implement products that have been manufactured widely, and to evaluate the results of the implementation of activities that have been implemented for enhancement.

Communication skills or communication skills are skills for someone to be able to provide or deliver and receive an update in accordance with the facts. Three components that need attention so that communication is going well. These components are motivation, knowledge, and competencies.

According to Trilling et al, (2009) collaboration with others can be done by (a) demonstrate the ability to work effectively and to respect other individuals or groups; (b) exercise flexibility and willingness to help in making the decision together to achieve a common goal; (c) assumes ourselves that the responsibility for work collaboration and respected contribution made by each individual team member.

Project-Based Learning

Project-based learning is meaningful as project-based learning. Project-based learning is used in education Science, Technology, Engineering, and Math integrated and practical, to improve the understanding of the subject matter (Capraro and Slough, 2009; Redkar, 2012) A very effective production-based learning model was developed in the learning of students in increasing creativity and innovation (Ganefri, 2013). Project-based learning stresses education that give odds on the learning system based on learners/learners, collaboratively and integrate the real issues and practical, effective teaching in building knowledge and creativity (Indrawan et al, 2018).

Collaboration

The underlying principle of collaborative learning is based on the collaboration of its members. For the implementation of effective education for sustainable development, appropriate learning strategies need to be selected and used. Collaborative learning is an educational approach to teaching and learning that involves groups of students working together to solve a problem, complete a task, or create a product (Chandra, 2015).

The benefits of collaborative learning include (a) The development of higher-order thinking, oral communication, self-management, and leadership skills; (b) Promotion of the interaction of teachers and lecturers-industry; (c) The increase in student retention, self-esteem, and responsibility; (d) exposure and increase understanding of the diverse perspectives; (e) Preparation for social situations and real-life work.

3 Methods

This study uses research and development (R & D). The flowchart of this study are shown in Figure 1.
The research subject is class XI student of VHS boarding school based on the competency skills of Computer Network and Audio Video Engineering. The analysis used data using quantitative descriptive. Retrieving data using questionnaires, tests, projects, and FGD models. Data were taken on the odd academic year 2018/2019. The development management model is a model of the existing three phases, then corrected in accordance with the review of the literature to be a hypothetik model. Hypotetik models discussed in the FGD before trial limited. Furthermore, the model is validated by experts relating to the management and education character.

4 Results

Based on collected data, acquired the existing model of industrial-grade management model in vocational schools Roudlotul Mubtadiin Balekembang, Jepara. The existing models can be seen in Figure 2.
Based on the research results show that there is an increased character on Roudlotul Muftadiin Balekambang vocational students. Increased industrial character in students include critical thinking, creative and innovative, communication, and collaboration.

With the literature review, the current model is improved so that industrial class management in pesantren-based vocational schools can run as expected. The results of these improvements were then discussed in a Focus Group Discussion by inviting experts in the education and pesantren-based vocational schools. Hypothetic model, the model has been improved later in the trial on competency skills of Lightweight Vehicle Engineering, Computer Network Engineering, and Audio-Video Engineering.

**Conceptual Model**

Project-based learning is used in education Science, Technology, Engineering, and Math integrated and practical, to improve the understanding of the subject matter (Capraro and Slough 2009; Redkar, 2012). Project-based learning stresses education that give odds on the learning system based on learners/learners, collaboratively and integrate the real issues and practical, effective teaching in building knowledge and creativity (Indrawan et al, 2018). A very effective production-based learning model was developed in the learning of students in increasing creativity and innovation (Ganefri, 2013).

Characteristics of the Project-Based Learning includes (a) learning and decision making framework; (b) There is a problem and the solution that has not been predetermined; (c) Learners design a process to determine the outcome; (d) Learners are responsible for managing the information obtained; (e) There is a continuous evaluation; (f) Learners regularly look back at his work; (g) The final result in the form of the tested product quality.

The Conceptual Management Model of industrial class based in pesantren is shown in Figure 3.
Based on Figure 3, the input of the model is the vocational students. In the management model developed at the planning phase consists of the MoU; lesson plan; Annual Program, Semester Program, and curriculum.

During the implementation phase of vocational students carry out two programs in schools, in the morning until noon vocational schools, and in the afternoon until evening Salafiyah school. On the implementation of vocational classes implemented project-based learning model (project-based learning) and teaching collaboration (collaborative learning is to deliver industry practitioners and lecturers from the fields of expertise as appropriate.

At the phase of monitoring and evaluation is by using the student's passport skill books and handbooks Qur'an. This handbook serves to monitor the development of the abilities and skills of the students or the students. Rasta is a term for the religious instruction of students in boarding school.

The output of this model is certainly the vocational graduates. Pesantren-based vocational school graduates expected. With hypothetic models is expected that students have the character of a critical forward-thinking, creative and innovative, communicative and collaborative in accordance with the demands of the industrial era 4.0. Expert validation is shown in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Rated aspect</th>
<th>Score Val1</th>
<th>Score Val2</th>
<th>Score Val3</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic Model development</td>
<td>3,789</td>
<td>4,000</td>
<td>3,842</td>
<td>3,877</td>
</tr>
<tr>
<td>2</td>
<td>Management Model on Industrial-Class Vocational Boarding Schools (Pesantren)</td>
<td>3,600</td>
<td>4,000</td>
<td>3,760</td>
<td>3,787</td>
</tr>
</tbody>
</table>

Figure 3. Design of Management Model on Industrial-Class Vocational Boarding Schools (Pesantren) to Develop Graduates with Character and Competence
Develop Graduates with Character and Competence

<table>
<thead>
<tr>
<th></th>
<th>Planning Component</th>
<th>Planning Procedure</th>
<th>Implementation Component</th>
<th>Procedure for the implementation phase</th>
<th>Evaluation Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3,300</td>
<td>4,000</td>
<td>3,800</td>
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<tr>
<td>4</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>5</td>
<td>4,000</td>
<td>4,000</td>
<td>3,667</td>
<td>3,889</td>
<td>4,000</td>
</tr>
<tr>
<td>6</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>7</td>
<td>3,000</td>
<td>4,000</td>
<td>4,000</td>
<td>3,667</td>
<td></td>
</tr>
</tbody>
</table>

Val= Validator

Validation of the initial product (design) conducted by experts consisting of experts Evaluation, Media, and Pondok Pesantren. There are seven aspects that the validator and each aspect be broken down into indicators of assessment. Aspects that the validator is (1) Basic model development; (2) Model-based industrial-grade management Boarding School; (3) The planning component; (4) The procedures for planning management model; (5) implementation components; (6) Procedure for the implementation phase; (7) and evaluation component.

After that conducted Focus Group Discussion (FGD), and improvements made on the advice of expert judgment. The hypothetic model that has been fixed is shown in Figure 4. FGD followed by a lecturer in mechanical engineering, management, machining vocational school teachers, teachers of the boarding school. Suggested improvements in the model are at the implementation phase using project-based learning. Evaluation of learning outcomes of product produced. Rate character on the observation of learning and test knowledge of the character of the industry 4.0.

Draft development partnership management model based vocational industry has been carried out by the FGD participants stated clearly, easy to read and understand. Sequentially that the management principle used in vocational partnership with industry is the planning, implementation, and evaluation and apply the principles management, the model can be used by all VHS-based boarding school.

Thus, the management model of industrial-grade based boarding school is able to: (1) as an evaluation of the learning program productive, (2) as synchronization vocational curriculum with industry, (3) to develop learning resources by teachers and students, (4) to develop production unit, (5) shall be implemented to improve the competency of teachers and students, (6) to measure the competencies achieved by students, (7) to meet the needs of working in Business and Industry. Hypothetic the model is shown in Figure 4.
Basic model development which is based on the concept of Project-Based Learning (PBL) is the link between VHS with industrial partners ranging from lesson plans, learning implementation, evaluation of learning and competency testing. The concept is combined with the model of the existing results of the preliminary study, then analyzed based on four principles, namely (1) the principle of management, (2) the principle of vocational education (Prosser & Quigley 1950) can be used to analyze models of existing and (3) the principles of project-based learning, (4) the principle of assessment of learning outcomes VHS must use a project-based assessment methods.

Product assessment is an assessment of the learners' skills in applying knowledge in the form of a product at a certain time in accordance with the criteria established in terms of both the process and the outcome. Product assessment conducted on the quality of a product. Rate product aims to (1) assess student skills in making certain products in connection with the achievement of learning objectives in the classroom; (2) assess the acquisition of skills as a requirement to learn the next skill; and (3) assess the ability of students to explore and develop ideas in designing and demonstrate innovation and creation.

An assessment project is an activity to determine the students' ability to apply their knowledge through the completion of a project instrument in the period or a specified time. An assessment project can be done to measure one or more of basic competencies in one or more subjects. An instrument in the form of a series of activities ranging from planning, data collection, organizing data, processing and presentation of data, and reporting.

An Assessment project aims to develop and monitor the student's skills in planning, investigating and analyzing the project. In this context, students can demonstrate their experience and their knowledge of a topic, formulate questions and investigate the topic through readings, tours, and interviews. Their activity can then be used to assess his ability to work independently or in groups. The product of a project can be used to assess the ability of students to communicate their
findings to the appropriate shape, for example, through a visual presentation of the results display or written report.

**Trial Model**

The field trials conducted in vocational boarding school based on pesantren Roudlotul Mubtadiin Balekambang. In the pilot phase include planning implementation and monitoring and evaluation. In the planning phase to try to involve design learning with industry partners. Then from industry partners giving out advice for learning is project-based. The project award is to try to design and animate vehicles using wifi network-based microcontroller. Competence expertise to implement the automotive engineering, Computer and Network Engineering and Audio-Video Engineering

In the implementation phase of the project carried out in the late afternoon after a vocational school or after school Salafiyah at night. Implementation lasted for 2 months. Once the projects are carried out the evaluation. The results of the evaluation of the project show that the project is done successfully turn the vehicle (motorcycle) using smartphones connected to the wifi network at school. Monitoring is also carried out on the project. At the time of implementation students often work until late at night so in the morning when school students feel sleepy. Then the materials are scattered many practices.

After the limited field trials further, implement the FGD regarding learning outcomes obtained. FGDs were held by inviting vocational school teachers, Principal, and deputy principal curriculum areas. Based on the obtained FGD improvement suggestions input to the model. The first is the suggestion of a professor of management at the planning phase that needs to pay attention to human resources include Man, money, materials, methods, money, and machine.

Furthermore, the improvement of the management model on Industrial-Class Vocational Boarding Schools (Pesantren) to develop graduates with character and competence. After the repair of suggestions when implemented the FGD final model of management model on industrial-class vocational boarding schools to develop graduates with character and competence. Final Model of management model on industrial-class vocational boarding schools to develop graduates with character and competence is shown in Figure 5.
The final model focuses on improving the character and competence-based vocational students boarding. The characters are developed in compliance with the challenges of the industrial era 4.0. On the input is a student or students. In component, planning is still the same but the substance of the contents of a learning plan tailored to the learning objectives at the implementation phase. During the implementation phase of the component that effecting the learning process is teachers. So that before teaching about industrial era 4.0, teachers also need to be trained first. On the final model of pre-learning to do training about industrial era 4.0 related to the opportunities and challenges for teachers at boarding school-based vocational Roudlotul Mubtadiin Balekambang, Jepara.

The next phase is learning for students. In the process of learning to use a project-based learning approach (PBL) and teaching collaboration, teaching-collaboration shown in Figure 6.

The project award is to create a robot pick n place that can be controlled using a wireless network. This collaborative learning involves teachers, professors, and industry partners. This collaboration is made possible, remembering the department of electrical engineering both on the competence of CNE and AVE is still lack of human resources on teachers.

Figure 5. The final Model of management model on industrial-class vocational boarding schools (Pesantren) to develop graduates with character and competence.

Industrial character:
- critical thinking;
- creativity and innovation;
- collaboration;
- communication.
In collaborative learning, teachers-lecturers-industries together doing projects based learning. In the early phases of learning to do before the division of tasks of educators. The division of tasks for teachers and lecturers-industries are shown in Table 2.

Figure 6. Teaching-collaboration model based on pesantren.
Table 2. Teaching-Collaboration

<table>
<thead>
<tr>
<th>Human Resources (HR)</th>
<th>Materials/ Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Computer and network basic, Broad-based network technology, Computer system</td>
</tr>
<tr>
<td>Lecturer</td>
<td>Basic programming, Basic electrical and electronics</td>
</tr>
<tr>
<td>Industry</td>
<td>Characters and Industrial competence</td>
</tr>
</tbody>
</table>

To measure student learning outcomes assessment is required in mid and end of learning. In the mid-term test knowledge on each competency expertise with computer materials and basic network, broad-based network technology, basic programming; drawing techniques; basic electricity and electronics.

Results of the study on the knowledge aspect shown in Figure 7, 8, 9.

Figure 7. Competency outcome on CNE

Figure 8. Competency outcome on AVE
The results of the pre-test critical thinking skills to 88 students put into five assessment criteria, namely: excellent (91-100), good (81-90), Average (76-80), less good (70-75), and not good (<70) shows that there are many students who are still difficulties in answering the questions given with scores below 70, ie 62.5% of the 88 students. Meanwhile 25% of students scored at the range of 70-75, seven students get grades 76-80, and four students gain a good value (81-90). While critical thinking skills pre-test, there are not any students who earn grades in the range of 91-100.

After the implementation of learning about critical thinking skills in the learning period, then carried out the post-test. The results of the post-test showed that there is an increase in students' understanding of critical thinking skills. Students who scored below 70 dropped from the pre-test before learning which is 55 students being only 3 students. Increased yield significant value in the range of 81-90 score as many as 45 students from the pre-test before learning that only 4 students only, as shown in Figure 10.
Overall an increase in average yield of 88 test critical thinking skills of the student. This translates into an average increase in test scores and students' understanding of material’s critical thinking skills. The average value of the pre-test showed at 66.10 and the average value of the post-test results is equal to 83.32, as shown in Figure 10. Thus, an increase of 21%.

Creative and Innovative

Meanwhile, the results of the implementation of the pre-test creative and innovative abilities showed that 49 students (55.68%) score below 70 out of 20 questions given. In the meantime 28.41% of students scored at the range of 70-75, 9 students scored 76-80, and four students gain a good value (81-90), and there is one student who got a very good value. After the implementation of learning about the creative and innovative abilities of students in the learning period, then carried out the post-test. The results of the post-test showed that there is an increase in students' understanding of critical thinking skills. In the post-test was not contained students who scored below 70 is inversely proportional to the pre-test before the study is 49 students. Increased yield significant value in the range of 81-90 grades of 32 students (36.36%) of the pre-test before learning that only four students, while the remaining 25 students (28.41%) had a value in the range of 70-75 and 9 students (10.23%) to get the value of 76-80 and 7 students to get very good.

Overall an increase in average yield of 88 test critical thinking skills of the student. This means an increase in the average value of the test the ability of creative and innovative students. The average value of the pre-test showed at 67.10 and the average value of the post-test results is equal to 80.00. Thus an increase of 16.05%, as shown in Figure 11.

Communication

The results of the pre-test communication capabilities showed that 41 students (46.59%) score below 70 out of 20 questions given. In the meantime, 37.50% of students scored at the range of 70-75, 9 students (10.23%) to get the value of 76-80, and five students gain a good value (81-90), and there are students that scored highly good or 91-100 range.

After the implementation of learning about the communication skills of students in the learning period, then carried out the post-test. The results of the post-test showed that there is an increase in students' understanding of critical thinking skills. At post-test, there are two students who scored below 70, down significantly on the pre-test as many as 41 students. Increased yield significant value in the range of 81-90 grades of 27 students (30.68%) of the pre-test before learning that only 5 students only, while the remaining 30 students (34.09%) had a value in the range of 70-75 and 21
students (23.86%) gets the value ranges of 76-80 and 8 students to get very good value, as shown in Figure 12.

![Figure 12. Increased character of communication](image)

Based on Figure 12, overall an increase in the average yield of 88 students test the communication abilities. This means an increase in the average value of the communication ability test. The Average value of the pre-test showed at 68.30 and the Average value of the post-test results is equal to 80.63. Thus an increase of 15.29%.

**Collaboration**

The implementation of the pre-test capability of the collaboration showed that there was 47 students (53.41%) score under 70. Meanwhile, 41.91% of students scored at the range of 70-75, 3 students (3.41%) gain grades 76-80, and two students get a good (81-90), and there are students who get very good value or range of 91-100.

After the implementation of learning about the capability of the collaboration of students in the learning period, then carried out the post-test. The results of the post-test showed that there is an increase in students' understanding of the ability to work together. At post-test, there are three students (3.41%) who scored below 70, down significantly from pre-test results as many as 47 students. Increased yield significant value in the range of 81-90 score as many as 43 students (48.86%) of the pre-test before learning that only 2 students only, while the remaining 14 students (15.91%) had a value in the range of 70-75 and 19 students (21.59%) gets the value ranges of 76-80 and 9 students to get a very good value, as shown in Figure 13.
Based on the results of two tests, overall an increase in the Average results of tests the ability of the student's collaboration 88. This means an increase in the average value of the test capability of the collaboration. The Average value of the pre-test showed at 67.50 and the Average value of the post-test results is equal to 83.41. Thus an increase of 19.07%, as shown in Figure 13.

**Conclusions**

Based on the research conclusions in this study are:

a. It has been found based industrial grade management model effective boarding school with basic learning project-based learning, collaboration and learning teaching block system to improve the character and competence of vocational students.

b. The management model based industrial grade boarding school consists of planning, implementation, monitoring, and evaluation. In planning includes the MoU, lesson planning, annual program, semester program, educational calendar, and curriculum. In exercising their training program before learning teachers with industrial materials 4.0 pad learning process using project-based learning, teaching collaboration, using the block system. On the implementation of the student’s study together (collaborative learning) to complete the project given. Salafiyah schools still use conventional methods of learning. Monitoring the development of students can use students' skills passport, handbooks Quran and can use the help of information technology.

c. There was an increase of characters needed in the industrial era 4.0 ie critical thinking, creative and innovative, communication, and collaboration. Improved critical thinking character the Average value of the pre-test of 66.10 and the Average value of the post-test results is equal to 83.32, an increase of 21%. Increased innovative creative character the average value of the pre-test of 67.10 and the Average value of the post-test is at 80.00 an increase of 16.05%. Improved communication character the Average value of the pre-test of 68.30 and the Average value of the post-test of 80.63, an increase of 15.29%. Increased collaboration character the Average value of the pre-test of 67.50 and the Average value of the post-test of 83.41, an increase of 19.07%.
Recommendations for VHS based on Pesantren

Project-based learning and teaching collaboration greatly enhance the character and competence of vocational students. Based on the research conclusions of this study include:

a. Enhancing their character vocational students,
b. Increase enhancing their competency-based vocational student’s boarding,
c. The discovery of industrial-grade management model,
d. Teaching collaboration teaching in Vocational Schools where there is a lack of teachers can be implemented by making lecturers as guest teachers on required subjects.

Limitation and Future research

This research is limited to the management model applied to pesantren. A future research project-based learning and teaching collaboration for the competence of different skills.

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Ganefri. (2013).“The Development of Production-Based Learning Approach to Entrepreneurial Spirit for Engineering Students’. Asian Social Science; Vol. 9 No. 12.


Hots based learning strategy on Modern Sanggul courses

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Abstract. Modern bun is a course that teaches different kinds of bun arrangement for various occasions. The study aims to describe the implementation of hots-based learning strategies on modern bun courses on the cognitive, affective and psychomotor aspects of the School of Beauty studies Program. This study was conducted at PKK Department of Beauty Education study Program, Faculty of Engineering UNNES. The population in this study is a 4th semester beauty student with a total sampling of 24 students. Data collection instruments consist of poll, assessment and problem sheet. Data analysis is done by using descriptive percentages. The results show that students have a category of learning outcomes: 1) Cognitive aspects to pretests the category is 83.3%, low category 16.5%, for posttest category is 67.5%, low category 32.5%, 2) affective aspect, the results of the category pretests is 62.5%, low category 37.5%, for posttest categories are 41.67%, low category 58.33% and 3) Psychomotor aspects, high category pretests results 29.17%, category medium 54.17%, low category 16.67% and Results posttest High category 20.83%, category medium 37.5%, low category 41.67%. The overall results of this decline are due to the need to continuously implement the Hots learning strategy so that students can perform analyses that can bring out the creativity of creation.

Keywords: Hots learning strategy, modern Bun Setup

1 Introduction

In the learning process, a teacher is required to develop the optimum potential of learners. Teachers as implementers in the learning process must have an understanding of the learning strategies used to encourage the development of learners' potential.

The use of strategy in learning will make it easy for teachers to achieve their learning objectives effectively and efficiently. Learning strategy is an activity to seek and utilize a variety of learning resources that are owned in learning to achieve competence or learning objectives. In addition, learning strategy is the guideline and reference to act systematically in learning for a teacher, while for students, the strategy that is done by the teacher can facilitate the learning process.

The strategies that can be used include integrating the higher order Thinking Skills (HOTS) in the learning process. Higher Order of Thinking Skill (HOTS) or high-level thinking skills are an ability to think that requires not only the ability to remember, but requires other higher abilities, such as creative and critical thinking skills. This is in line with the demands of the 21st century competence which is critical thinking, creative and innovative, communication skills, ability to cooperate (collaboration) and confidence (Ditjen GTK: 2018:2).
One of the strategies that can be used to develop HOTS is to implement an active learning model centered on learners and based on Constructivism. A learning model based on constructivism that can help learners to develop the ability to analyze, evaluate, and create is a learning model of Problem Based Learning. The LBL is a learning model that emphasizes authentic problem-solving such as problems occurring in everyday life (Tung, 2015:228). It is in accordance with the opinions of Kilbane & Milman (2014:281), the problem-based learning model is an active learning model that allows students to learn and hone problem-solving skills, develop competence with academic content standards, and realize the relevance of applying content area learning for practical purposes. The Problem-Based Learning model consists of four major phases or steps: (1) present or identify the problem, (2) develop a plan for solving the problem, (3) implement the plan for solving the problem, and (4) evaluate the implementation plan results.

The implementation of this learning strategy in modern bun courses is one of the efforts to create independent students and to improve their creativity through the ability to analyse and evaluate their work. Modern bun learning is usually done through demonstration methods and students do in accordance with the examples given, this makes the lack of independence and creativity of students especially in the process of creating a bun that is adapted to the shape of the face. Therefore, the need to familiarize students to think critically and creatively in order to be able to apply their skills in community life. This strategy is suitable for modern bun learning because students must have the ability to analyze various facial forms, determine the form of a bun, use the ability to communicate and cooperate with the model in the application of its knowledge.

Based on this, it is necessary to know how the results of the implementation of HOTS-based learning strategy (problem based learning) in modern bun learning.

2 Research objectives

This research aims to describe the results of implementing HOTS-based learning strategy in the learning of modern bun based on cognitive, affective and psychomotor aspects.

Research Methods

This research refers to quantitative research approaches. While the type of research used in this research is research quasi experimental design. The population in this study is a student of the beauty study program of PKK faculty of Engineering Unnes who took the course of modern bun semester 4 a number of 24 people. Sampling technique uses a total sampling. The method of collecting data on this research is derived from the documentation that contains the results of a bun arrangement based on the face form seen from cognitive, affective and psychomotor aspects. The analytical techniques used in this research are descriptive analysis with a quantitative approach. A descriptive analytical technique used to demonstrate the extent to which the achievement of learning outcomes by implementing Hots-Based Learning Strategies (PBL) is based on cognitive, affective and psychomotor aspects.
Table 1. Category sharing assessment of learning outcomes

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>$X &lt; (\mu - 1.0\sigma)$</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Medium</td>
<td>$(\mu - 1.0\sigma) \leq X &lt; (\mu + 1.0\sigma)$</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>$X \geq (\mu + 1.0\sigma)$</td>
<td></td>
</tr>
</tbody>
</table>

Results and discussion

The results of a descriptive analysis of the cognitive aspects before and after the implementation of Hots-based Learning Strategy (PBL) with the achievement category of high, moderate, and low.

Table 2. Cognitive Pretest Results

<table>
<thead>
<tr>
<th>category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>20</td>
<td>83.3</td>
<td>83.3</td>
<td>83.3</td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>16.5</td>
<td>16.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Cognitive Posttest Results

<table>
<thead>
<tr>
<th>category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>11</td>
<td>67.5</td>
<td>67.5</td>
<td>67.5</td>
</tr>
<tr>
<td>Low</td>
<td>13</td>
<td>32.5</td>
<td>32.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 2 results pretests and table 3 results posttest of the entire respondent can be known there is a number of students in the category of medium to cognitive aspects. The pretests results showed a number of 20 students (83.3%) is in the category of medium and after getting the treatment occurs a decline of 11 mahasiswa (67.5%) Medium category. There is a decline in the number of students in medium category. This is because students are less concerned with theoretical mastery, more focused on practice and are not yet accustomed to analyze deeply on hairdressing for various facial forms because they usually practice using mannequin and pay attention to the lecturer demonstration.

Table 4. Affective Pretest Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>15</td>
<td>62.5</td>
<td>62.5</td>
<td>62.5</td>
</tr>
<tr>
<td>Low</td>
<td>9</td>
<td>37.5</td>
<td>37.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 5. Affective Posttest Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>10</td>
<td>41.67</td>
<td>41.67</td>
<td>41.67</td>
</tr>
<tr>
<td>Low</td>
<td>14</td>
<td>58.33</td>
<td>58.33</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 4 on the affective aspect of the pretests results shows a category of 15 students (62.5%), low category 9 (37.5%) and table 5 results of posttest are known to decrease the number of students in the category as much as 10 students (41.67%) and low 14 (58.33%)

Table 6. Psychomotor Pretest Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>7</td>
<td>29.17</td>
<td>29.17</td>
<td>29.17</td>
</tr>
<tr>
<td>Medium</td>
<td>13</td>
<td>54.17</td>
<td>54.17</td>
<td>54.17</td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>16.67</td>
<td>16.67</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 7. Psychomotor Posttest Results

<table>
<thead>
<tr>
<th>Kategori</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>20.83</td>
<td>20.83</td>
<td>20.83</td>
</tr>
<tr>
<td>Medium</td>
<td>9</td>
<td>37.5</td>
<td>37.5</td>
<td>37.5</td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
<td>41.67</td>
<td>41.67</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 6 pretests results on the psychomotor aspect known number of students in the high category of 7 students (29.17%), category is 13 students (54.17%) and a low category of 4 (16.67%). After implementation of the Hots Learning Strategy (PBL) (table. 7) There was a decline in the number of students in the high category of 5 students (20.83%), 9 students (37.5%) Category medium, and Low category 10 (41.67%). Decreasing the amount after postest because students find it difficult to apply the concept of the arrangement because of different hair conditions, in the daily practice of using mannequin with an ideal face is on a problem based students are asked to make a bun arrangement with a real model (human). Need habituation to practice directly with different models of face shape.
Conclusion

Based on the results of the analysis shows the decline of results based on cognitive, affective and psychomotor aspects in the study of making modern bun according to facial form using Hots-based learning Strategy (PBL). This is because students are less concerned with the mastery in theory, more focused on practice and yet accustomed to analyze deeply on the styling of the hair for various forms of the face because it usually pays attention to the demonstrations given by the lecturer. In addition, students find it difficult to apply the concept of the arrangement because of different hair conditions, in daily exercises using mannequin with the ideal face and the implementation of its design with the real model (human). Therefore, the need for habituation to conduct analysis on various forms of face and practice directly with the real model so that it can familiarize students with creative and critical thinking.
References


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The Effectiveness of Android Based Javanese Alphabet Learning Media on Student Learning Outcomes

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Abstract. Javanese alphabet as one of Indonesian culture gradually began to be forgotten along with the low interest of students to learn Javanese alphabet. Low student interest also affects learning outcomes. Factors affecting the suboptimal learning outcomes of Javanese alphabet there are no innovative learning media and attracting students' attention. The research method used Waterfall. The sample used 57 elementary school students in grades 4 and 5 in Kudus Regency. Data collection techniques that has been used were questionnaire, interview, pretest and posttest. The data analysis technique uses questionnaire. The result of this research, the average of pretest score is 59,925 and the average of posttest score is 77,765. It was proven that there was an increase in student learning outcomes. The conclusion of this research is Android-based Javanese alphabet learning media is effective to improve students learning outcomes in the content of Javanese language lessons in Javanese script.

Keywords: Learning Media, Effectiveness, Javanese Alphabet.

1 Introduction

Javanese language is one of the most widely-used languages in Indonesia, it has millions of speakers. While the Javanese language still thrives in daily conversation, the number of users of Javanese script, the traditional script of the language, decreases every day (Louis Lady Zhangrila, 2018). However, the people nowadays are facing the problem where not all the Javanese people are able to read the Javanese scripts, particularly the young generation people (Abdul Robby G., et al, 2019). Javanese alphabet as one of Indonesian culture gradually began to be forgotten along with the low interest of students to learn Javanese alphabet. Javanese alphabet is now very rarely used in written documents. Javanese people mostly translate using Latin letters to express Javanese (Heru Spriyanto, 2019).

In the past, Javanese alphabet was used to write literary works. Relics of this literary work can still be found in various museums and libraries. The number of relics is not only one, but thousands. However, because at this time there are not many people who can read and write Javanese, so many manuscripts are damaged but have not had time to read and know the contents (Venny Indria Ekowati, 2014).

The effort to preserve Javanese alphabet was also pursued by the government by including it in the education curriculum. Javanese alphabet material began to be taught in grade 3 elementary school. A pretty good effort to introduce culture to the community early on, but still, there are still many students who find it difficult and less interesting to learn Javanese
This happens because the use of learning media is less than optimal (Ervan Adi K., 2015).

Edgar Dale makes a level from concrete to abstract a media in the form of an experience cone or cone of experiment, in this cone the first student must play an active role in learning involving real experiences or meaningful learning, after that students as observers of real events, then students observe the events presented in the media used, in addition to observing events in the media the most recent is students observing the symbols presented (Daryanto, 2016).

From the results of observations that has been done by researchers at SDN 2 Mlati Norowito Kudus, the learning media that has been used by teachers are textbooks. Textbooks sometimes cannot be used all the time and are considered boring by some students (Marlinda R., 2015). However, textbooks also have some shortcomings, especially in this technological era (M Saputra, et al., 2018)

Development of learning media also has linear connection with technological advances. Media utilization is one of the efforts to create meaningful learning process and improves quality output. Advanced technology such as LCD, projector, e-library, and e-learning are already familiar in education. Currently, smartphone has great opportunities to be utilized as a learning media since its presence in 2010, it has distributed around the world and several operating system, but today Android became the most widely used platform in the world (U Cahyana et al., 2018)

Kominfo states that in 2018 the number of active smartphone users in Indonesia is more than 100 million people. With such a large number, Indonesia will become the country with the fourth largest active smartphone user in the world after China, India, and America. A new breakthrough in the world of education by utilizing smart phone is to be used as a kind of new media in teaching and learning. The results showed the use of media types android in the learning process is able to provide a positive impact to the indicated increase in the desire to learn new ones, and provide a major influence on students' psychological (Nugroho Prasetya Adi, et al,2016). Android is a software framework that includes overall mobile device and consists of an operating system, middleware and key applications set (Nugroho Prasetya Adi, et al, 2016).

In education world, it has found many technologies can support in teaching and learning activities because most of the lecturers and students have used various hardware and software of android as a tool to achieve maximum learning outcomes because students have experience and participate directly (E. A. Alghamdi and S. R. Shah,2018)

Heru Supriyono (2015) explained that the Javanese script application that he developed using Adobe Flash CS6 is suitable for use as a learning medium in the classroom. But with the development of gadget technology, almost all students have gadgets that support interactive media. Researchers assume that the use of flash as software is considered less flexible because it only runs on certain hardware. Research on the Javanese script learning media has been carried out by Nining Setiani (2017), an application developed named HANACARAKA. HANACARAKA is an android-based application that was developed using Android Studio tools with some good features, like Javanese script material features, Javanese to Latin script conversion, and evaluation features. The HANACARAKA application is proven to be able to increase student interest in learning. But the level of effectiveness of the media is not yet known.

Considering the high level of use of Android-based smartphones by Indonesian people and the low interest of students in learning Javanese script which has an impact on low student learning outcomes, the researchers took the initiative to develop an android-based javanese alphabet learning media. With the development of this learning media, it is expected to be able to help facilitate students in learning Javanese alphabet and improve student learning outcomes.

The purpose of this study is to knowing the effectiveness of Android-based Javanese
Script learning media to improve student learning outcomes in Javanese Literature subject matter in Elementary School level

2 Method

The development procedure that has been used in this research is the SDLC (System Development Life Cycle) method, with Waterfall development model. The waterfall model is widely used by researchers because the development process is organized. The Waterfall model was proposed by Royce in 1970 which is the SDLC (System Development Life Cycle) model. There are 5 stages in the waterfall model, including communication, planning, modeling, construction, and deployment (Pressman, 2015).

In this research there are several things that has been done by researchers: (1) Data collection which includes Java language syllabus of Elementary School grade 5, Javanese script history material, carakan script material, sandhangan material, and pasangan material. (2) Make an story board which will be used as a guide for the placement of the object layout and application navigation buttons. (3) Design assets of android based Javanese Alphabet learning media using Corel Draw X7. These assets include navigation buttons, background images, application logos, and titles. (4) Making animation and supporting music effects. (5) Creating an application project using Construct 2. (6) Exporting the project to html format. (7) Convert html files to apk format using the Website 2 APK Pro application. (8) Conduct testing of applications, including black-box testing, eligibility tests from media experts and material experts, as well as testing the effectiveness of applications for student learning outcomes.

3 Findings and Discussion

In education world, it has found many technologies can support in teaching and learning activities because most of the lecturers and students have used various hardware and software of android as a tool to achieve maximum learning outcomes because students have experience and participate directly (Y. Rathod, M. Dighole, and R. Sharma, 2018).

The results of this research is Android-based Java alphabet learning media application for elementary school students. This learning media application was tested at SDN 2 Mlati Norowito Kudus. Researchers conducted two meetings and twice learned to use the application. Things that were examined include: (1) the design of the development of an Android-based Java alphabet learning media application; (2) the feasibility of an Android-based Java alphabet learning media application; (3) the effectiveness of Java alphabet learning media applications.

3.1 Product Design

The design of an Android-based Java alphabet learning media application was made based on teacher interviews and syllabus of grade 5 SDN 2 Mlati Norowito Kudus.

Tools and materials used by researchers to create the applications include: (1) Lenovo B40 Intel Core i3 laptop (2) Corel Draw X7 to create application display designs; (3) Adobe Premier Pro 2015 to create animated scripts in a way; (4) Construct 2 for application programming; (5) Website 2 APK Pro to convert the project into an Android application.

3.2 Product Result

The results of this research is Android-based Java alphabet learning media application. Java alphabet learning media application is an android-based application that contains things that can facilitate elementary school students in learning Javanese Script. This application contains three main menus, namely the Learning Menu, Evaluation Menu, and Conversion
Menu. The material in it also varies, ranging from the script carakan, sandhangan, couples, and also the history of Javanese script.

This application has an evaluation feature to test the user's ability after learning and supported by animation and sound effects that make the application more interactive.

4 Test Result

Application testing is one of the stages of the Research and Development method which is carried out after the coding process is completed to determine the feasibility of the application. There are three aspects of testing carried out, namely functionality testing (black-box test), compatibility testing (application testing to several different versions of the Android OS), as well as feasibility tests by media experts and material experts.

4.1 Functionality Testing Result

Functionality testing in this study was carried out using a black-box test which was carried out independently. The testing aspects include testing the function of buttons, menus, and views per page.

The results of the black-box test stated that the javanese alphabet learning media application was in accordance with what was expected by being shown from the acquisition of the testing of each test case. Black-box testing has no bugs that are displayed from the display of the test results of each test case. So it can be stated that the black-box testing of android based javanese alphabet application learning media is valid.

4.2 Compatibility Testing Result

Compatibility Testing is done by testing applications on various mobile device platforms, which include android versions, RAM sizes, internal memory sizes, and different types of processors. Tests carried out using various smartphone devices with Android versions above Android 4.4 (Kitkat).

There are 6 devices that are tested directly then a 100% percentage calculation or can be said to be "very good" from compatibility testing.

4.3 The Effectiveness of Android Based Javanese Alphabet Application Learning Media

User tests were conducted on grade V and class IV SDN 2 Mlati Norowito, with a total 32 students. The average score of student learning outcomes in product trials before using the android-based Java alphabet learning media application was 56.25, while the average - the average score of student learning outcomes after using the application is 75.94. Student learning outcomes after using the Android-based Javanese Alphabet learning media application can be seen in table 2.

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Score</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Lowest Score</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Average</td>
<td>56.25</td>
<td>75.94</td>
</tr>
<tr>
<td>The number of students completed</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Percentage of students completed</td>
<td>31.25%</td>
<td>78.125%</td>
</tr>
</tbody>
</table>

Table 1. Pretest and Posttest Result on SDN 2 Mlati Norowito
4.4 N-Gain Test

N-Gain Test was conducted to determine the increase in the pretest and posttest scores. The formula to find out applying the N-Gain test is as follows:

\[
N\text{-Gain}(g) = \frac{Posttest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}
\] (1)

The results of the average improvement test are presented in the following table.

<table>
<thead>
<tr>
<th>Categori</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average pretest score</td>
<td>56.25</td>
</tr>
<tr>
<td>Average posttest score</td>
<td>75.94</td>
</tr>
<tr>
<td>Difference in average</td>
<td>19.69</td>
</tr>
<tr>
<td>N-gain class</td>
<td>0.45</td>
</tr>
<tr>
<td>Criteria</td>
<td>Medium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categori</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average pretest score</td>
<td>63.6</td>
</tr>
<tr>
<td>Average posttest score</td>
<td>79.6</td>
</tr>
<tr>
<td>Difference in average</td>
<td>16</td>
</tr>
<tr>
<td>N-gain class</td>
<td>0.6</td>
</tr>
<tr>
<td>Criteria</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Based on table 3 it can be seen that the increase in the average (gain) of the pretest data and the posttest score of fifth grade students of SDN 2 Mlati Norowito Kudus is 0.45 with difference in average score of 19.69.

Based on table 4 it can be seen that the increase in the average (gain) of the pretest data and the posttest score of fifth grade students of SDN 2 Jepang Pakis Kudus is 0. 6 with difference in average score of 16.
An increase in the average shows that the Android-based Java alphabet learning media application is effectively used to improve learning outcomes. Improved student learning outcomes are presented in the following diagram.

![Learning Outcomes](image)

**Fig. 1. Improved Learning Outcomes**

## 5 Conclusion

Based on the results of research and discussion that has been outlined, it can be concluded that, Android-based Java alphabet learning media application is proven to be effectively used in learning activities in local Javanese language content. There is an increase in the learning outcomes of elementary school student in Kudus.

## 6 Acknowledgement

Researchers would like to thank for Teachers of SDN 2 Mlati Norowito to complete this research.

## References


The Portrayal of Transactional Distance Theory in Online Learning Model during Learn from Home Period at Engineering Faculty, Unnes

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Abstract. The outbreak of COVID–19 has severe impacts in various sectors including education. All schools and campuses must be cleared from any activities. However, learning process must still run for the students. Distance learning which was previously an option has now become a compulsory means of education. Engineering Faculty, Universitas Negeri Semarang also uses distance learning process. Therefore, this study is aimed at describing the implementation of distance learning. This study employed Moore’s transactional distance theory in online learning model as its theoretical framework. The data were collected from the documents and a website used for distance learning in Unnes. Then, the data were analysed qualitatively and quantitatively by using descriptive statistics. The results showed that the percentage of transactional distance between students and teacher is 83.48%, the percentage of transactional distance between students and content is 90.12%, the percentage of transactional distance between students and student is 95.492%. All of those constructs are categorized as very high.

Keywords: distance learning, e-learning, transactional distance theory

1 Introduction

The outbreak of COVID – 19 has severe impacts in various sectors including education. All schools and campuses must be cleared from any activities including classical teaching and learning process in physical classrooms. However, learning process must still be conducted for the students. Distance learning which was previously an option has now become a compulsory means of education. Because only very few universities in Indonesia have fully online classes. Most of the universities in Indonesia use online classes as substitutions under the circumstances when learning process cannot take place in a physical class. Universitas Negeri Semarang actually has an e-learning platform which accommodates distant learning process called “ELENA”. It has been underused before the pandemic of COVID – 19. However, it has been increasingly used by faculties and students of Universitas Negeri Semarang. The e-learning technology like every other forms of technology is neither good or bad in itself, how we use matters the most (Bates, A. W., & Bates, T, 2005). Therefore, this study is aimed at describing the implementation of distance learning in Engineering Faculty, Universitas Negeri Semarang.
2 Online Learning Model

Online learning is one of the forms of technology which has been widely integrated in education. Courses can be categorized as online courses if at least 80 percent of its content is delivered online (Allen & Seaman, 2013). Online learning can be considered as a part of the distance learning which employs mainly internet as its means of education. The categorization of learning process by its means of delivery is conducted by Allen & Seaman, 2013) which can be seen on this table.

<table>
<thead>
<tr>
<th>Proportion of Content Delivered Online</th>
<th>Type of Learning Process</th>
<th>Typical Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>Traditional</td>
<td>A learning process without online technology to deliver its content. It employs writing or verbal means of communication to deliver its learning contents</td>
</tr>
<tr>
<td>1% - 29%</td>
<td>Web Facilitated</td>
<td>A learning process which is facilitated with a web-based technology to assist its face-to-face meeting. It may use a course management system (CMS) or web pages to post the syllabus and assignments.</td>
</tr>
<tr>
<td>30% - 79%</td>
<td>Blended/Hybrid</td>
<td>A learning process which uses both online and face-to-face meeting. Most of its contents are delivered virtually, it typically employs online discussions, and typically has less significant number of face-to-face meetings.</td>
</tr>
<tr>
<td>80+%</td>
<td>Online</td>
<td>A learning process whose most or all of its learning materials are delivered online. It typically does not have face-to-face meetings.</td>
</tr>
</tbody>
</table>

Table 1. Online learning process categorization by Allen & Seaman, 2013
Online learning is a relatively new in learning process in higher education. However, online education programs across various disciplines has grown steadily (Allen & Seaman, 2013). One of the advantages which drives the growth of the online education is that it can help departments meet increasing demands of students’ registration, and give further supports for students and faculty (Willetta, Chris Brown, Leigh Ann Danzy-Bussell, 2019). The most advantageous aspect of online learning is the flexibility and autonomy for students to take courses in terms of time and their capacity. For the campus, it can widens its students’ intake as it can cover students who cannot go to campus or physical classroom.

3 Transactional Distance Theory

Moore (1973) was interested in investigating the Independent Study program which was the embryo of the distance learning today. The prominent characteristic of the Independent Study program is that the learning process occurs within distant situation in which the lecturers and the students are at separate place and time in planned learning situation (Moore, 1997). Moore (1991) argued that the degree of distance learning in a program is a relationship between three variables: dialog, structure, and learner autonomy. Moore’s definition of dialog is “the interaction between the teacher and learner when one gives instruction and the other responds” (p. 3). Structure is the extent of flexibility or rigidity of the course design. Moore (1991) defined structure as “describes the extent to which an education program can accommodate or be responsive to each learner’s individual needs” (p. 4). Learner autonomy concerns with the amount of autonomy that the learner has in the learning process. Moore (1991) postulated that high structure and low dialog leads to high transactional distance. As a consequence, lowering learning structure while allowing more learner autonomy decreased transactional distance and ultimately leads to high student learning autonomy. The illustration of Moore’s theory on distance learning can be seen on this following figure.

![Fig 1. The relationship between dialog, structure, and learner autonomy](image-url)
Moore (1989) proposed three kinds of interaction during distance learning program: interstudent, student and teacher interaction, and student and learning content interaction. Many researchers have then expanded the interactions which occur during distance learning program: the teacher and student and inter student interactions (Fulford & Zhang, 1993; Sutton, 2001); interactions with the interface of a learning system (Hillman, Willis, & Gunawardena, 1994); and inter teachers interaction, teacher–content interaction and inter contents interactions (Anderson & Garrison, 1998).

4 Method

This study employed a descriptive survey design. Gay & Diehl (1992) argue that survey research methods are common methods of research that mainly uses questionnaires and interviews as instruments to collect data. Zikmund (1997) corroborated that the survey research method is one of the research techniques in which the data are collected from a number of samples in the form of people, through questions. Bailey (1982) argues that the survey research method is a research method in which the data collection technique is performed by either written or oral questions.

Descriptive survey was carried out in this study as the aim of the study is to present a picture of an online learning phenomenon. The data collection technique in this study is an online questionnaire. Statistics used to analyze data in descriptive surveys are descriptive statistics (central tendency, size of distribution, and size of correlation).

This study used revised version of Zhang’s scale of transactional distance (Zhang, 2003) by Paul., et al (2015) as the instrument to collect the data. The revised version of Zhang’s scale of transactional distance can be seen on table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>TDST = Transactional distance between students and teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The instructor pays no attention to me</td>
</tr>
<tr>
<td>2</td>
<td>I receive prompt feedback from the instructor on my academic performance</td>
</tr>
<tr>
<td>3</td>
<td>The instructor was helpful to me</td>
</tr>
<tr>
<td>4</td>
<td>The instructor can be turned to when I need help in the course</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>TDSC = Transactional distance between student and content</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>This course emphasized SYNTHESIZING and organizing ideas, information, or experiences into new, more complex interpretations and relationships</td>
</tr>
<tr>
<td>6</td>
<td>This course emphasized MAKING JUDGEMENTS about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions</td>
</tr>
<tr>
<td>7</td>
<td>This course emphasized APPLYING theories and concepts to practical problems or in new situations</td>
</tr>
</tbody>
</table>
5 – point Likert scale was used for each item of the revised version of Zhang’s scale of transactional distance by Paul., et al, 2015. The questionnaire consisted of 12 items which measure three constructs of the distance learning: TDST = Transactional distance between students and teacher, TDSC = Transactional distance between student and content, and TDSS = Transactional distance between students and students. The population of this study consisted 131 students of Civil Engineering Educational Department; Engineering Faculty; Universitas Negeri Semarang who underwent online courses due to the outbreak of COVID – 19. 70 students were involved as samples of this study. The data were analysed by using a descriptive statistic to show the percentage of the students’ response to each item by using SPSS version 22.

Table 2. revised version of Zhang’s scale of transactional distance by Paul., et al, 2015

<table>
<thead>
<tr>
<th>No</th>
<th>TDSS = Transactional distance between students and students</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>I get along well with my classmates</td>
</tr>
<tr>
<td>9</td>
<td>I feel valued by the class members in this online class</td>
</tr>
<tr>
<td>10</td>
<td>My classmates in this online class value my ideas and opinions very highly</td>
</tr>
<tr>
<td>11</td>
<td>My classmates respect me in this online class</td>
</tr>
<tr>
<td>12</td>
<td>The class members are supportive of my ability to make my own decisions</td>
</tr>
</tbody>
</table>

Table 3. The results of 1st item of the TDST

Table 3 shows the results of the 1st item on the TDST. The mean of the data = 2.2286, with S.E of mean = 0.11895, Median = 2.000, Mode = 2.00, SD=0.99523, variance = 0.990, and range = 4.00. Based on the mean value of score, 55.715% students agree that the instructor pays attention to themselves during the online course.
Statistics

Q2: I receive prompt feedback from the instructor on my academic performance

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.6143</td>
<td>.11741</td>
<td>4.0000</td>
<td>4.00</td>
<td>.98235</td>
<td>1.004</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 4. The results of 2nd item of the TDST

Table 4 shows the results of the 2nd item on the TDST. The mean of the data = 3.6143, with S.E of mean = 0.11741, Median = 2.000, Mode = 4.00, SD=0.98235, variance = 0.965, and range = 4.00. Based on the mean value of score, 90.3575% students agree that the instructor provide prompt feedback on the students’ academic performance.

Statistics

Q3: The instructor was helpful to me

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.8429</td>
<td>.11976</td>
<td>4.0000</td>
<td>4.00</td>
<td>1.00196</td>
<td>1.004</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 5. The results of 3rd item of the TDST

Table 5 shows the results of the 3rd item on the TDST. The mean of the data = 3.8429, with S.E of mean = 0.11976, Median = 4.000, Mode = 4.00, SD=1.00196, variance = 1.004, and range = 4.00. Based on the mean value of score, 96.0725% students agree that the instructor was helpful during the online course.

Statistics

Q4: The instructor can be turned to when I need help in the course

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.6714</td>
<td>.11991</td>
<td>4.0000</td>
<td>4.00</td>
<td>1.00320</td>
<td>1.006</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 6. The results of 4th item of the TDST

Table 6 shows the results of the 4th item on the TDST. The mean of the data = 3.6714, with S.E of mean = .11991, Median = 4.000, Mode = 4.00, SD=1.00320, variance = 1.006, and range = 4.00. Based on the mean value of score, 91.785% students agree that the instructor provided necessary assistance for the students who need help during the online course.

Transactional distance between students and content
The results of the Transactional distance between students and content variable can be seen on this table 7, 8, and 9.

**Statistics**

Q5 This course emphasized SYNTHESIZING and organizing ideas, information, or experiences into new, more complex interpretations and relationships

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.6000</td>
<td>.10455</td>
<td>4.0000</td>
<td>3.00</td>
<td>.87477</td>
<td>.765</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 7. The results of 1st item of the TDSC

Table 7 shows the results of the 1st item on the TDSC. The mean of the data = 3.6000, with S.E of mean = .10455, Median = 4.000, Mode = 3.00, SD=.87477, variance = .765, and range = 4.00. Based on the mean value of score, 90.00% students agree that this course emphasized synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships.

**Statistics**

Q6 This course emphasized MAKING JUDGEMENTS about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.5857</td>
<td>.10274</td>
<td>4.0000</td>
<td>4.00</td>
<td>.85961</td>
<td>.739</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 8. The results of 2nd item of the TDSC

Table 8 shows the results of the 2nd item on the TDSC. The mean of the data = 3.5857, with S.E of mean = .10274, Median = 4.000, Mode = 4.00, SD=.85961, variance = .765, and range = 4.00. Based on the mean value of score, 89.6425% students agree that this course emphasized making judgements about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions.

**Statistics**

Q7 This course emphasized APPLYING theories and concepts to practical problems or in new situations

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>3.6286</td>
<td>.11361</td>
<td>4.0000</td>
<td>4.00</td>
<td>.95054</td>
<td>.904</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 9. The results of 3rd item of the TDSC

Table 9 shows the results of the 3rd item on the TDSC. The mean of the data = 3.6286, with S.E of mean = .11361, Median = 4.000, Mode = 4.00, SD=.95054, variance = .904, and range = 4.00.
Based on the mean value of score, 90.715% students agree that this course emphasized applying theories and concepts to practical problems or in new situations.

**Transactional distance between students and students**

The results of the Transactional distance between students and content variable can be seen on this table 9, 10, 11, 12, and 13

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Q8 I get along well with my classmates</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>70</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.6143</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.13695</td>
</tr>
<tr>
<td>Median</td>
<td>4.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>4.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.14579</td>
</tr>
<tr>
<td>Variance</td>
<td>1.313</td>
</tr>
<tr>
<td>Range</td>
<td>4.00</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 9. The results of 1st item of the TDSS

Table 9 shows the results of the 1st item on the TDSC. The mean of the data = 3.6143, with S.E of mean = .13695, Median = 4.000, Mode = 4.00, SD = 1.14579, variance = 1.313, and range = 4.00. Based on the mean value of score, 90.325% students agree that they can get along well with my classmates.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Q9 I feel valued by the class members in this online class</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>70</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.8000</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.11619</td>
</tr>
<tr>
<td>Median</td>
<td>4.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>4.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.97207</td>
</tr>
<tr>
<td>Variance</td>
<td>.945</td>
</tr>
<tr>
<td>Range</td>
<td>4.00</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 10. The results of 2nd item of the TDSS

Table 10 shows the results of the 2nd item on the TDSS. The mean of the data = 3.8000, with S.E of mean = .11619, Median = 4.000, Mode = 4.00, SD = .97207, variance = .945, and range = 4.00. Based on the mean value of score, 95% students agree that they feel valued by the class members in this online class.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Q10 My classmates in this online class value my ideas and opinions very highly</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>70</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.9286</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.11205</td>
</tr>
<tr>
<td>Median</td>
<td>4.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>4.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.93749</td>
</tr>
<tr>
<td>Variance</td>
<td>.879</td>
</tr>
<tr>
<td>Range</td>
<td>4.00</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 11. The results of 3rd item of the TDSS
Table 11 shows the results of the 3rd item on the TDSS. The mean of the data = 3.9286, with S.E of mean = .11205, Median = 4.000, Mode = 4.00, SD = .93749, variance = .945, and range = 4.00. Based on the mean value of score, 98.215% students agree that they feel valued by the class members in this online class.

### Statistics
Q11 My classmates respect me in this online class

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3.9000</td>
<td>.11357</td>
<td>4.0000</td>
<td>4.00</td>
<td>.95021</td>
<td>.93738</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 12. The results of 4th item of the TDSS

The mean of the data = 3.9000, with S.E of mean = .11357, Median = 4.000, Mode = 4.00, SD = .95021, variance = .93738, and range = 4.00. Based on the mean value of score, 97.5% students agree that classmates respect them in this online class.

### Statistics
Q12 The class members are supportive of my ability to make my own decisions

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3.8571</td>
<td>.11562</td>
<td>4.0000</td>
<td>4.00</td>
<td>.96738</td>
<td>.936</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 13. The results of 5th item of the TDSS

The mean of the data = 3.8571, with S.E of mean = .11562, Median = 4.000, Mode = 4.00, SD = .96738, variance = .936, and range = 4.00. Based on the mean value of score, 96.42% students agree that their classmates are supportive of their ability to make their own decisions.

### 6 Conclusion

Several conclusions which can be withdrawn based on the results of the data analysis in this study are as follows: 1) On the construct of transactional distance between students and teacher, based on the mean value of the score, 55.715% students agree that the instructor pays attention to themselves during the online course; 90.3575% students agree that the instructor provide prompt feedback on the students’ academic performance; 96.0725% students agree that the instructor was helpful during the online course; 91.785% students agree that the instructor provided necessary assistance for the students who need help during the online course; 2) On the construct of transactional distance between students and content, based on the mean value of the score, 90.00% students agree that this course emphasized synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships;
89.6425% students agree that this course emphasized making judgements about the value of information, arguments, or methods such as examining how others gathered and incorporated data and assessing the soundness of their conclusions; 90.715% students agree that this course emphasized applying theories and concepts to practical problems or in new situations; 3) On the construct of transactional distance between students and students, based on the mean value of the score, 90.325% students agree that they can get along well with my classmates; 95% students agree that they feel valued by the class members in this online class; 98.215% students agree that they feel valued by the class members in this online class; 97.5% students agree that classmates respect them in this online class; 96.42% students agree that their classmates are supportive of their ability to make their own decisions.

References


Students’ Perception of The Blended Learning Model Implementation in Vocational Field at Home Economics Department Semarang State University

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2Student of Department of Home Economics, Faculty of Engineering, Semarang State University, Semarang Indonesia

Abstract. Human resources in the industrial revolution era 4.0 are expected to master and to be able taking advantage of digital literacy. Graduates from the Department of Home Economics (PKK) are prospective vocational teachers who will be the agents of reformation to habituate the digital literacy to the students. Because of that reason, the learning activities in the Department of Home Economics is using a blended learning model. The data analysis technique used in this study was descriptive percentages. Statement items related to facilities, motivation, material and tasks, time and cost, independence, communication/interaction, and responses to tasks with categories ranging from strongly disagree to strongly agree were used as the data collection instrument. The results show that the overall perception of students as prospective vocational teacher was “agree” with the percentage of 53.5%, while the smallest was 0% in the category of “strongly disagree”, the second largest was 34% “less agree”. Then 10% “strongly agree” and 1.9% “disagree.”.

Keywords: implementation of blended learning, student’s perception, home economic department.

1 Introduction

The industrial revolution has evolved to the industrial revolution 4.0. The industrial revolution 4.0 is not only faced by the world trade but also the world of education. Education must provide creative human resources using digital technology. Higher education institution must develop a quality culture in order to have global level competitiveness. The world of education in learning activities not only focuses on reading data computation competencies but also complements data literacy, technology literacy, and human literacy. Data literacy is related to the ability to read, analyze, and make conclusions of thinking based on the data and information obtained. In technology literacy related to the workings of machines, the application
of technology to produce maximum results. While human literacy is related to the ability to communicate, collaborate, think critically, creatively, and innovatively.

In higher education institutions, the industrial revolution 4.0 is, among others, addressed with programs and service models that provide more or use digital technology (online) for example the learning activities using online systems which then develop massive open online course infrastructure. Thus Universitas Negeri Semarang (UNNES), developing curriculum that is anticipatory and adaptive so that one of the policies in learning is applying the blended learning model, using Elena, which encourages students to learn independently. In addition to the curriculum, there is a course on Digital Literacy and Humanity.

The curriculum in the Department of Home Economics (PKK) contains practice and theory courses. The distribution of courses in each semester is adjusted to the competencies, lecturers, and facilities of the department. Learning activities are usually carried out face-to-face model and with the assignment of presentations, reviewing articles, and making papers that have been done but the results are not yet satisfied. In the future, the graduates as prospective vocational teachers must have the ability shown in aspects of attitudes, knowledge, and skills. In other activities, approximately 15% of students are involved in student organizational activities such as HIMPROM, ENERC, RISTEK, BEM, and others. The achievements made by PKK Department students are low, less than 2% who have non-academic achievements. Students in the PKK Department come from various provinces, mostly from the Central Java region, which is spread from several districts. According to the previous education level, most of the students are graduated from high schools and around 26.2% of vocational high schools.

The application of the blended learning model is to strengthen the ability of students to face the work era in the future as professional vocational teachers. Learning activities with blended learning models are learning activities that combine face-to-face and online learning. According to Bonk and Graham [1] blended learning is the combination of instruction from two historically separate models of teaching and learning: Traditional learning systems and distributed learning systems. It emphasizes the central role of computer-based technologies in blended learning.

Blended learning gives students the opportunity to determine when to start and when to finish, and which parts of the module or material will be studied first. If there is material that is not yet understood by students, it can communicate according to the specified media.

Blended Learning model uses online media learning and traditional learning, namely face to face. According to Thorne [2] blended learning is learning that combines multimedia technology in the form of a CD-Room, video streaming, virtual classroom, email, conference telephone, and video streaming with traditional learning that is face-to-face learning. Meanwhile, Semier in Husamah [3] stated that blended learning combines online learning, face-to-face, and real-world practice. Blended Learning uses an approach that empowers various sources of information.

In general, this research was conducted to determine the perceptions of students as perspective vocational teachers on the implementation of blended learning model. It is to explore the students’ perception in using blended learning models.

2 Research Method

The study used a qualitative approach; analyzing and describing the perspectives of students as prospective vocational teachers towards a blended learning model. The sample in
this study was taken by means of a purposive random sampling of 210 students who filled out the questionnaire by following the form of a Likert scale. This scale measures students' perceptions on the implementation of the blended learning model with positive answers located on the left and negative answers on the right. Acceptance or rejection is stated in the agreement, starting from “strongly agree” with a score of 5, “agree” with a score of 4, “less agree” with a score of 3, “disagree” with a score of 2 and “strongly disagree” with a score of 1.

The data analysis technique used in this study is descriptive percentages that describe findings in the perception of blended learning model with logical statements about facilities, motivation, material and tasks, time and cost, independence, communication / interaction, and response to tasks.

3 Result and Discussion

Learning is a process with the series of actions between educators and students on the reciprocal relationships that take place in educational conditions to achieve learning objectives. In learning activities, there is a process of acquiring knowledge, mastery of skills, and the formation of attitudes in students. Students have a high role in learning success that is supported by a learning environment such as facilities, materials, learning models used, and others. As the prospective vocational teachers, the graduates of PKK Department must have the ability aspects of professional attitudes, knowledge, and skills to be ready to work in their fields. Through the learning activities of the blended learning model students will interact with learning resources and learning environments that occur inside and outside the classroom.

The results showed that students' perceptions on the implementation of the blended learning model are presented in table 1.

### Table 1. Total Data

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>4</td>
<td>1.9</td>
<td>Disagree</td>
</tr>
<tr>
<td>73</td>
<td>34.8</td>
<td>Less Agree</td>
</tr>
<tr>
<td>112</td>
<td>53.5</td>
<td>Agree</td>
</tr>
<tr>
<td>21</td>
<td>10</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Most of the respondents stated that they are “agree” 53.5%, then 34.76% of respondents “less agree”, 10% of respondents “strongly agree”, and 1.9% “disagree”. It shows that the implementation of the blended learning model supports the learning activities undertaken by students to achieve their abilities as the prospective vocational teachers.

The detailed research data on each item is presented in a row as follows, starting from facilities, motivation, material and tasks, time and cost, independence, communication and interaction, and response to tasks.

3.1 Facilities

The facility is a support facility used in blended learning from students and from the campus. The results of the research are presented in table 2.
Table 2. Facilities.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>12</td>
<td>2.38</td>
<td>Disagree</td>
</tr>
<tr>
<td>73</td>
<td>34.76</td>
<td>Less Agree</td>
</tr>
<tr>
<td>40</td>
<td>14.29</td>
<td>Agree</td>
</tr>
<tr>
<td>95</td>
<td>45.24</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The research data in table 2 shows that most students stated “agree” with a percentage of 45.24%. Then a number of 34.76% of respondents expressed “less agree”, then in a row 14.29% of respondents stated “strongly agree” and 2.38% of respondents said “disagree”.

Facilities are very important in implementing the blended learning model. Support facilities provided by the campus and students themselves make learning activities using the blended learning model run well.

The internet network at UNNES uses a bandwidth of 1.6 GB supported by optical fiber connections between faculties. Hotspots are provided in the classrooms, gazebo, which are installed electricity lines around the PKK Department and the Faculty of Engineering and they can be used by the students. This provides convenience and comfort to the students in accessing the internet related to learning activities and doing assignments.

In addition, students also use their own facilities, such as laptops and smartphones in accessing the internet in blended learning activities. This shows that facilities related to the blended learning model is generally good.

3.2 Motivation

Motivation is the process of encouraging. Related to learning, motivation is an activity that can provide enthusiasm for learning. The results of the study are presented in table 3.

Table 3. Motivation

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.95</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>16</td>
<td>7.62</td>
<td>Disagree</td>
</tr>
<tr>
<td>69</td>
<td>32.9</td>
<td>Less Agree</td>
</tr>
<tr>
<td>91</td>
<td>43.3</td>
<td>Agree</td>
</tr>
<tr>
<td>32</td>
<td>15.2</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Table 3 shows that 43.3% of respondents “agree”. Other responses from students are 32.9% “less agree”, then 15% “strongly agree”, 7.62% “disagree” and 0.95% “strongly disagree”.

In learning activities, motivation is needed. Motivation for learning can come from outside and from within individuals. Most students’ perceptions of learning activities using the blended learning model mostly agree that blended learning can motivate learning. This is in line with research conducted by Handaru [4] that there is an increase in student motivation due to the application of blended learning models by 11.705. The content presented by the lecturer in
uploading material can motivate students to learn. Likewise, research by Farihah [5] stated that the blended learning model has an influence on the motivation and learning outcomes of class X students of SMA N 1 Pitumpapua.

### 3.3 Material and Tasks

The students learn the material and do the tasks from the lecturer.

#### Table 4. Material and Tasks

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.43</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>8</td>
<td>3.81</td>
<td>Disagree</td>
</tr>
<tr>
<td>72</td>
<td>34.3</td>
<td>Less Agree</td>
</tr>
<tr>
<td>90</td>
<td>42.9</td>
<td>Agree</td>
</tr>
<tr>
<td>38</td>
<td>18.1</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

In the content of material and tasks, 42.9 respondents “agree”. Others said that they “less agree” 34.3%, then 18.1% “strongly agree”, 3.81% said they “disagree” and at least 1.43% “strongly disagree”.

Most of the students’ perceptions on learning activities using blended learning stated that they agree with the material presented that is systematic and easy to understand. Material that is systematic and easy to understand makes it easy for students to learn. In addition, students determine themselves when to start and when to finish within a certain time limit. Students’ lack of understanding of the material and assignments can be communicated with the lecturer. The results of this study differ from the results of Nuryansyah's research [6] that a number of 33.33% said “disagree”. The uploaded material was difficult to understand and students kept asking questions until they understand. According to the students, it would be difficult to do online.

### 3.4 Time and Cost

The time and cost means students have perceptions about the efficacy of using blended learning models.

#### Table 5. Time and Cost

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.95</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>10</td>
<td>4.76</td>
<td>Disagree</td>
</tr>
<tr>
<td>49</td>
<td>23.3</td>
<td>Less Agree</td>
</tr>
<tr>
<td>88</td>
<td>41.9</td>
<td>Agree</td>
</tr>
<tr>
<td>61</td>
<td>29</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>
Table 5 shows about the time and cost data. 41.9% of respondents “agree”, 29% stated that they “strongly disagree” then 23.3% of respondents said they “less agree” and another 4.76% of respondents said they “disagree”. The smallest number is 0.95% of respondents who “strongly disagree”.

The applied blended learning model makes the students no longer need to come to campus because students can learn and do it anywhere, so the students have more optimal time. Scheduled time can be used to do other things related to academic and non-academic activities. The students have more time to explore their potential to improve their abilities, where later after graduation they will become professional vocational teacher candidates, so they must study a lot on campus and off campus. In addition, students no longer need to collect assignments in the form of hard copies or do not come to campus to collect assignments so that students can save the costs.

### 3.5 Independence

According to Tirtaraharja [7] independence in learning is learning activities that are driven by the will from within, their own choice, and their own responsibilities from learning. Learning independence is very necessary so that they have the responsibility in organizing and disciplining themselves in completing their assignments. In learning activities using the blended learning model, students have the will to learn even if they are not accompanied by a lecturer.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.48</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>8</td>
<td>3.81</td>
<td>Disagree</td>
</tr>
<tr>
<td>62</td>
<td>29.5</td>
<td>Less Agree</td>
</tr>
<tr>
<td>105</td>
<td>50</td>
<td>Agree</td>
</tr>
<tr>
<td>34</td>
<td>16.2</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

In table 6, a number of 50% of respondents “agree” that the implementation of the learning model of blended learning in has the effect of independence in learning, this is the largest percentage. Then, 29.5% of respondents expressed “less agree”, 16.2% of respondents expressed “strongly agree”, and 3.81% of respondents stated “disagree”, while the smallest presentation of 0.48% of respondents stated “strongly disagree”.

In the implementation of the blended learning model, 50% of the students stated agree. The blended learning model makes students able to learn independently. The online assignments or questions given by lecturers will guide students to be able to study independently. The students learn to manage time for academic activities and other supporting activities. Through blended learning, the students will find their own alternative answers which then determine the correct and correct answers. Husamah stated that students are free to manage the study independently which are available on line. Likewise, according to Aynur Gecer [8] students will be responsible, active, and work hard in participating in learning activities using the blended learning model. It will create the independence of student learning. The students are aware of their responsibilities in the learning environment using blended learning, where they access the internet to obtain material and development. The results of the study conducted by Aynur Gecer, found that students were aware of their responsibilities, they were active and worked hard in participating in learning activities of the blended learning model. In a study conducted by...
Shamsi S. Bawaneh [9], there was a positive relationship between the number of online files seen by students, the number of online discussion messages and their performance. Similarly, the results of research by Mukaddes Erdem and Pinar Nuhgulu [10], the students have quite positive opinions on blended learning and its implementation and Facebook can be the right tools to communicate and interact. In another study conducted by Yunika Lestari et al [11], it was said that blended learning model can increase student learning independence higher than students taught by ordinary learning.

3.6 Communication and Interaction

Communication and interaction between students and lecturers can be done face-to-face or online. Communication between students and lecturers is an important thing to do in the learning process. What the lecturer wants related to the learning objectives will be conveyed to the students. The results of the research are presented in table 7.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.95</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>21</td>
<td>10</td>
<td>Disagree</td>
</tr>
<tr>
<td>64</td>
<td>30.5</td>
<td>Less Agree</td>
</tr>
<tr>
<td>94</td>
<td>44.8</td>
<td>Agree</td>
</tr>
<tr>
<td>30</td>
<td>14.3</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

In table 7, the largest percentage is 44.8% of respondents “agree”. The smallest percentage is 0.95% of respondents who “strongly disagree”. Next, 30.5% of respondents said they “less agree”, then 14.3% of respondents said they “strongly agree”, then 10% of respondents said they “disagree”.

Interaction in the learning process is very important, both between students and students and between lecturers and students. Well established interaction will facilitate the students in learning. Based on the result, the students feel more comfortable communicating and interacting with students and with lecturers. Although they are not face to face, they can communicate and interact with students and lecturers in broader time and opportunities. Moreover, the students still feel the presence of lecturers, although not directly. The students feel more comfortable expressing questions and opinions than directly. Sometimes the students cannot express things directly, so they prefer doing blended learning. It is in line with the research by Nuryansyah and Lestanto, which states that 57.41% of students agree that online lectures make it easier to interact with lecturers.

3.7 Response to Tasks

The students’ response to the task are presented in table 8 as follows.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8. Response to Tasks
In table 8, 40.5% respondents expressed “less agree”. The small percentage of 2.38% of respondents stated “strongly disagree”. Other 30% said they “agree” and 17.1% said they “strongly agree” and 9.52% of respondents said they “disagree”.

In response to tasks, 40.5% of the students stated that they “less agree” with statements preferring to respond to questions or tasks directly compared to online. It means that students have a good perception of the uploaded questions or tasks. Students have time and opportunity to prepare materials to do the tasks or answer the questions. The results of this study are not in line with the results of research by Nuryansyah Adijaya and Lestanto, which is 50% of the respondents “agree” that students prefer to respond to questions directly rather than online. It can be due to the lack of available facilities, so that it will experience difficulties when accessing it.

4 Conclusion and Suggestion

4.1 Conclusion

The results of the research shows that students have a good perception on the implementation of the blended learning model, 53.5% responded “agree”. The existing lectures are theoretical and practical subjects. In online lectures, the material is selected accordingly in the form of videos, PPT, or documents along with the assignments that must be done by the students. Lecturers still provide the necessary feedback and advice so that communication and interaction between students and lecturers remain well established and the most important thing is the learning objectives are achieved. So, the blended learning model is well implemented in PKK Department.

4.2 Suggestion

Although the overall students' stated “agree in the implementation of blended learning, the facilities still need to be improved. For example the use of computer laboratories not only for scheduled learning activities but also can be used for completing lecture assignments outside of the class hours.

References


Puff Pastry Practice Learning Using Search Engines

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¹Lecturer of Family Welfare Education Program, Universitas Negeri Semarang
²Alumnus of Family Welfare Education Program, Universitas Negeri Semarang

Abstract. The search engine can contain all visual information, including the product of puff pastry. Along with the advancement of technology, it is easy for people to obtain information on the internet to learn something new. This research includes the 4th-semester students of the Culinary Department in UNNES who are taking the Pastry class. The sample covers total sampling. The variable of this sampling is the use of a search engine and the practical score of puff pastry creation. Data collected through a closed-ended questionnaire and documentation. The analysis of the data used the Pearson Correlation. The result of the research shows that there is a significant correlation between the use of the search engine and the practical score of puff pastry creation in the range of 0.598 in the significant rate of 0.00 with the linear connection on the ratio of 1.44434.

Keywords: Search Engine, Learning Resources, Puff Pastry, Pearson Correlation.

1. Introduction

In the era of globalization, the advancement and development of technology are very fast. The development of technology will cover the fields of education. Academic search engines such as Google Scholar, IEEE Xplore, PubMed, and SciPlore.org, which greatly increased the ability of researchers to make their articles available to academics public. Like other types of ranking search results, articles displayed in the top positions are more likely to be read [1]. The internet is available with hundreds of thousands of web pages, it's better to use a search engine to reach data that is following what is needed or information [2]. The use of information technology makes the education process easier, through the internet, the source of information can be easily accessed. Learning source is a helpful source for students to learn in the learning process. Learning source comes from a textbook, printed media, electronic media, surrounding nature, et cetera [3]. Learning styles classify the various ways people learn and how they approach information; like acting and reflection; pay attention and listen; memorize and visualize; logical and intuitive reasoning [4,5,6].

Learning style is considered important as a material consideration in the academic world education process which is also supported by a variety of available literature. Among other variables, differences in learning styles can be influenced by the language, the culture, the education department, and gender [6]. Learning source is a set of materials or situation which allows students to learn independently [7]. Learning source is a power that is used for the process of teaching and learning, directly or indirectly [8].

The most advanced learning resources come from the internet [9]. Internet as a medium that does not have restrictions on every Internet user information is very helpful for effectiveness and efficiency [10]. A search engine is a kind of software, which functions to collect data about a website. Data collected related indexed analyzed in the database. All of these operations are
carried out by search engine software. They navigate web pages periodically and capture changes that occur to available websites [11].

In a modern class, there should be an internet connection. The integration of internet connection can help the teaching and learning process to be better in accessing the information, people browse and search on the internet [12]. People access search engines to look out information on the internet [13]. Search engine optimization is based on keywords that are suitable for the website and can be used for searching search engines. To optimize website browsing according to search engines, it must be following some technicalities conditions [14]. The higher and more frequently a site appears in search results, the more visitors who browse using the search engine [15].

The search engine has excellence in practicality amongst other learning sources. Through search engines, people can also get visual information. In this research, the author focuses on the use of a search engine for the learning of puff pastry. Puff pastry is a light and smooth pastry made of laminated dough that can be topped or filled, sweet or savory, allowing the emergence of a wide variety of products of pastry. Unlike other laminated baked goods such as croissants and Danish cakes, puff pastry is made from the unleavened dough without other developer ingredients [16,17].

Puff Pastry is the queen of all pastry. Puff Pastry is a product of bakery from wheat flour, eggs, fats, and water through the oven healing process [18]. People get through this process by layering the cakes. To achieve the best layer, the chef should have strong accuracy and correct technique. Due to this reason, students in the culinary department consider that pastry is the most difficult unit to take.

From the initial observation, students should repeat the practice of making puff pastry in 2 to 3 times to produce the best product in the best criteria. The failure of the product happens since they cannot make a fluffy cake in different layers. In this material, many students are demanded to master it in detail through the existing learning sources. The learning sources come from handouts containing the materials of puff pastry from its ingredients through its procedures. However, conventional materials do not succeed in making the students understand, especially in explaining a certain technique. Therefore, a search engine is proposed to make students able to find information for making puff pastry, whether in texts, pictures, audios, or videos. It is expected that students can easily, practically, and completely comprehend the technique. The premise of this research is visual information in a search engine is better than the verbal information from the lecture. Hence, the research wants to find whether there is a correlation between the use of a search engine and the practical score of students in the puff pastry class.

2. Methods

This research was conducted to the Culinary Department of UNNES who takes Pastry class and practicing on making Puff Pastry. The population of this research is 41 students. The sample of this research is the whole population of it, which contains 30 female students and 11 male students. The variables of this research are 1) the use of a search engine, which includes the indicator of experience, quantity, quality as the independent variables, and 2) the practical score of puff pastry as the dependent variable. The data of this research came from documentation and questionnaire. The questionnaire was used to know the use of a search engine as the learning source specifically for the material of puff pastry. Meanwhile, the practical score of puff pastry came from the documentation. The writer analyzed the data from the correlating analysis of “Pearson Correlation” [19]. The correlation coefficient describes the strength and direct relationship between several variables. Pearson Correlation is a measure of
linearly distributed relationships between two random variables [20]. Pearson correlation coefficient, also known as the product-moment correlation coefficient. The coefficient is measured on a scale with no unit and can take values from 0 to +1 [21].

3. Results and Discussion

Data were obtained through a questionnaire on the frequency of use of search engines as a reference in the media that are presented in the following diagram. The frequency of using search engines as a source of learning seems to be of high intensity, while none of the students have used search engines. No student never uses a search engine. Overall, the search engine completely helps the students in learning how to make puff pastry. The search engine helps students to obtain complete and quick information regarding puff pastry. Media cover people, materials, tools, activities, and behavior [22]. The search engine is an electronic librarian which helps the students to get a book based on a particular topic and author [23]. The use of a search engine is based on three indicators, which are experience, quantity, and quality as in the following table.

Fig. 1. The Frequency of Search Engine Utilization as Learning Sources.

Fig. 2. The Indicator of Search Engine Utilization.
The three indicators have the balances of experience, quantity, and quality of the use of a search engine. The average score of the students’ experience is 36.67% or 3.3 out of 4. Meanwhile, the quantity covers 34.51% or 3.1, and the indicator of quality which is 28.82% or in the average score of 2.6. The result of the practical score can be seen in the following graph as follows.

![Graph showing the distribution of scores among different indicators.](image)

**Fig. 3. Puff Pastry Practical Score.**

The score of puff pastry creation shows that students are in the score of very good. 65.85% of students got AB, and 34.15% of them got A. The practical score of puff pastry consists of preparation, process, and result. The above figure is the score which is obtained after the students use a search engine to find learning sources. The high score indicates that the learning process succeeds. The raw input, instruments, and environment are the influencing factors for the students in learning [24]. Learning outcome from vision sense is 75%, hearing is 13%, and others are 12%. It is confirmed that the research from BAVA (*British Audio Visual Aids*, 1988) that the information from hearing sense is 13% while other senses are 87%. The researches show that visual sense has a better influence than the others. In relevance to this research, the search engine helps the students to create a puff pastry from its visual information [25].

The correlation of the use of the search engine and the score of puff pastry through Pearson Correlation obtain the $r_{hit> r_{table}} = 0.598 >0.308$ with the significance of 0.00. The result indicates that there is a strong correlation between these variables. In detail, students tend to get a higher score if they use the search engine. The linear regression analysis shows that there is a same correlation that $Y=A+BX; r= 0.598$ where $B$ (slope) = 1.44434; $A$ (intercept = 83.7714) ; $Y =$ practical score and $X =$ the use of search engine.

Through the application of Lectora Inspire, students obtain a better score than the use of textbooks ($t=9.226$ and $p=0.004< a=0.05$. 2) [26]. Meanwhile, the use of Computer-animated instruction (CAnI) has a positive effect on teaching students complex, abstract, and dynamic problems for the matriculation in Malaysia. The score was obtained from the open-ended questionnaire, pretest, and post-test [27].

There is a positive and significant effect on the use of Google to the learning result of economy class students from the XI IPS class. The students obtained a score of 3.144 for confidence with a 1.988 table score and the equation of $3.144>1.988$ [28]. There is a positive and significant correlation from the use of the internet as the source of learning for the geography class of XII IPS, since $r_{xy}$ score is 0.556 which is higher than the $r_{Table}$ score of...
1%, resulting in from the r score of 0.351 and 5% Table. The r score resulted 0.271 or rxy of 0.556 which is higher in 5% and 1% is 0.271 < 0.556 > 0.351 [29].

The function of learning resources is to increase the success rate of students. There is a tendency of students who use search engines as a source of learning to have high grades and vice versa high scores on students are the intensity of their use of search engines is also high. Then, students can learn quickly and master the material better. Later, they can get a satisfactory score for the puff pastry class. This can be seen from the value of the correlation between the frequency of search engine users with the practicum value in making puff pastry.

4. Conclusion

The conclusion of this research contains a significant correlation between the use of a search engine and the result of practice in making puff pastry for the 4th-semester students in the culinary education program. The correlation score of this research is 0.598 in the significant rate of 0.00 and the linear correlation ratio of 1.44434. There is a positive and significant effect on the use of Google to the learning result. The search engine completely helps the students in learning how to make puff pastry.

References


E-Learning Development Through The Animated Video Tutorial Media to Improve The Outcomes of Beauty Basic Learning

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Family Welfare Education, Faculty of Technical, Semarang State University

Abstract. The massage theory must be understood and practiced by the students of the Beauty Vocational School in class X, who have been less attractive by using the modules and drawings on paper sheets. The objectives of this research is to find out the feasibility of the video and learning outcomes after applying this tutorial video. The results showed that the animated video tutorial is very feasible (90.73) to improve the development for students in all of the X grade at vocational high schools. The learning outcomes that have increased from an average pre-test results to post test results, and the acquisition of understanding with an N-Gain test of 0.52 in moderate criteria. The conclusion are obtained that the improvement of e-learning through the animated video tutorial media is very feasible and can improve the results of learning outcomes.

Keywords: media, animation-video, massage, learning, results

1 Introduction

The basic of beauty is one of the subjects for the vocational high school students majoring beauty basic, where the students are faced with new material that has never been obtained before. Then the delivery of material will be more interesting with the selection of appropriate learning methods and media. The media is a means used to convey messages from a communicator to the communicant [8]. The use of media in the learning process is more efficient, effective and helps to absorb the subject matter deeper and complete the subject matter [2]. Regarding the media used when learning the beauty basic subjects, so far they still use printed modules and drawings. This media is often used in conveying material because it is easy to develop and search in various sources, but this print media has the disadvantage of not only showing dead images, no sound so it is very unattractive and seems outdated [1]. The media is a determinant of student learning success [9] The media is able to stimulate students' thoughts, concerns, feelings and abilities or skills so that they encourage learning activities that can improve student learning outcomes.

The learning media in the learning process serves to make learning more effective, accelerate the teaching and learning process and improve the quality of the teaching and learning process [4], which means changing the role of students more positively and productively and can help from other educational aspects such as personality formation, helping the learning difficulties and motivate learning. One of the learning media developed is video animation tutorial media with the help of Adobe Animate software that can be displayed via laptops and
mobile phones. Animated videos can enrich students because they gain experience and competence [12]. It is necessary to design a video animation tutorial learning media to overcome the problems that exist in the school, so that learning becomes more effective [6]. By using video learning media, the teacher conveys lessons to students more easily for subject matter [11].

The animated video tutorials about the beauty basic subject can draw attention to the presence of sound and 24 massage movements in the real skin care steps, making it easier to describe the material and be able to explain something complicated to be more precise. The choice of video as a medium are able to combine between visuals and audio, can also be packaged in various forms. The benefits of video as a media are: 1) growing motivation, 2) the meaning of the message will be clearer so that it can be understood, (3) the audience will do more activities during the learning activities. The aims of this study were: 1) to determine the feasibility of the media 2) to determine the learning outcomes of the basic beauty subjects by using animated media tutorials for the Class X vocational high school students.

2 Methods

This research using the research and development (Research and Development) methods. This research is used to produce certain products, then test the effectiveness of these products. This research was conducted to develop and test the feasibility of instructional media animated video tutorials on beauty basic subjects with facial skin care materials for class X vocational high school students in semester I. Testing was conducted with one group pre-test post test, with the aim of obtaining information on whether the learning media was effective or not. Product design can be directly tested after being revised and validated by the experts [10].

The development model of animated video tutorial media for facial skin care that is used refers to the development model [5] which has been changed according to the conditions and needs. This study only took 7 stages out of 10 stages included: needs analysis, planning, development, small-scale trials, initial revisions, large-scale trials, and final products. The research development procedure can be explained as follows:

2.1. Requirements Analysis

At this stage, the needs analysis by observing and gathering information is carried out to study some of the existing literature in the form of books / printed images as initial material in compiling video animation tutorials.

2.2. Planning

The planning phase is carried out to arrange things related to research, starting from the video animation tutorial and everything that supports the research. Furthermore, formulating video content that is adjusted to the curriculum, syllabus, KI and KD, and RPP. This design formulation helps to clarify the direction of learning on the teaching material that will be developed through an animated video tutorial. This stage contains the contents, objectives and storyboard.

2.3. Development
The development phase is the stage where the researcher develops learning media in the form of video animation tutorials using Adobe Animate application. After developing, the product is assessed by 3 experts namely, 1 media expert, 1 educational technology expert, and 1 material expert. This is intended to evaluate the product that has been made, if found some deficiencies that must be corrected, then the animated video tutorial for facial skin care tutorial is revised, therefore it is ready to be tested.

2.4. The Small Scale Test

The small-scale test are conducted as initial trials after the video has been validated by the experts. A small scale trial was conducted involving 6 students as respondents.

2.5. Initial Revision

The media revision is done if in the process of learning media validation, one or more or all of the validator states that the media is invalid. The first stage of the product revision process is carried out in accordance with directions and instructions from the validator which states it is invalid. This process can be continued to the next stage if the learning media is declared valid by all expert validators.

2.6. The Large-Scale Trials

Conducting large-scale trials involving 30 students as samples to apply the product that has been made in the form of an animated video tutorial, with test collection techniques, the test is a pre-test before treatment and post-test after applying the video animation tutorial media in learning with the aim to retrieve data, and provide questionnaires for responses to students.

2.7. Final Product

The final product is produced from large-scale trials. At this stage the product can already be used as a learning media.

There are two research variables, namely the development of instructional video animation as the learning media which were previously in the form of teaching materials (facial care printed images), and the variable learning outcomes of the Class X students. Data analysis used was quantitative. Product data analysis includes media feasibility analysis by the experts, analysis of student responses, analysis of initial data with normality test, and final data analysis with N-gain test and hypothesis test. The sampling technique used was total sampling ie all (30 students of class X TKKR Vocational High School).

Data collection techniques used the observation methods to obtain data on the facial care learning activities. The test methods used to measure the knowledge possessed by students in the form of pre-test and post-test instruments. The questionnaire method in this study is divided into two namely:

1). Questionnaire for the expert lecturers consisting of the 3 expert lecturers to validate the eligibility of facial care tutorial animated videos (media experts, educational technology experts and the material experts)

2). Questionnaire for the responses given to students to obtain the response data on the animated video tutorial for facial treatment.
3 Results and Discussion

3.1. Media Development

Observation and data collection that has been obtained by researchers take action by developing instructional videos animated tutorials using adobe animate software. The next step is testing through validation stage by 3 experts namely material experts, educational technology experts and media experts. Small group tests and initial revisions were also carried out, as well as large-scale trials accompanied by filling in questionnaires about the media that used by the students.

3.2. Media Feasibility

Product viability is determined from the results of the validator evaluation. Material experts, educational technology experts and media experts aim to evaluate how feasible material and media developed and provide suggestions or revisions if deemed necessary. The following table summarizes the results of the average validation assessment of the experts:

Table 1. Average results of The Experts Validation Recapitulations

<table>
<thead>
<tr>
<th>No.</th>
<th>Media Indicators Assessments</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Material</td>
<td>94.44%</td>
</tr>
<tr>
<td>2.</td>
<td>Education Technology</td>
<td>90.97%</td>
</tr>
<tr>
<td>3.</td>
<td>Media</td>
<td>86.80%</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>90.73%</td>
</tr>
</tbody>
</table>

Based on the table above shows that the percentage obtained by the material experts is 94.44%, from the educational technology experts 90.97%, and 86.80% from the media experts. The average result of the three indicators above is 90.73% in the very feasible criteria, meaning that the media is feasible to be used as a learning media.

Table 2. The Learning Outcomes of Class X TKKR

<table>
<thead>
<tr>
<th>No</th>
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<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>67</td>
<td>79</td>
</tr>
<tr>
<td>2</td>
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</tr>
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<td>71</td>
<td>82</td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>5</td>
<td>66</td>
<td>77</td>
</tr>
</tbody>
</table>
### 3.3. The Difference in The Learning Outcomes Before and After using the Media

The difference in learning outcomes before and after using the media can be known after conducting experiments in the sample class, namely the students of class X of Beauty Management at Taman Siswa Kudus, Vocational High School. From the data obtained, the average score of pre-test was 68.9 and post-test was 85.2. As a result students experience improved learning outcomes after using tutorial animation media. In addition to an increase in

<table>
<thead>
<tr>
<th>Amounts</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Average</td>
<td>68.9</td>
<td>85.2</td>
</tr>
<tr>
<td>Difference</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>Lowest grade</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>Highest grade</td>
<td>76</td>
<td>98</td>
</tr>
</tbody>
</table>
learning outcomes between pre-test and post-test, the data collection with a questionnaire was also conducted to determine student responses about the use of learning media that were developed.

Fig. 1. Graph of the students responses

From the graph above shows that students are tend to agree and enthusiastic learning using animated video tutorial media which is very helpful in understanding facial treatment material. The average result of students' responses is 92.1% with very good criteria. The results of the analysis with the N-Gain test to determine the increase in student holding from the pre-test and post-test results obtained 0.52 in the medium category.

4 Discussion

The development of basic beauty subject’s learning media using Adobe CC Animate is carried out in several stages, including needs analysis, planning, development, small-scale trials, initial revisions, large-scale trials, final revisions. The material used in the animated video tutorial is facial care material on the facial massage.

Based on the indicators, the material delivered with instructional video animation tutorials provides effective understanding and can improve learning outcomes. The media selection criteria based on their accuracy with the learning objectives greatly affect student learning outcomes. Those findings are similar with the opinion[3] explained that material delivered using the media can affect the learning outcomes to be improved. The feasibility of the learning media used is very much needed as a tool to make it easier to convey the subject matter to students, so it is necessary to develop an interesting media. This is consistent with the opinion [7] which explains the benefits of learning media can lead to motivation, more interesting lessons, can directly interact actively in learning.
5 Conclusion

1) The development of video animation tutorial learning media on the basic beauty subjects is carried out by researchers through 7 stages developed by Borg and Gall covering analysis, planning, development, small-scale trials, initial revisions, large-scale trials, and final products. The feasibility test are conducted by the material experts, the educational technology experts and the media experts stated that the instructional video animation tutorial media is very suitable to be used as a learning media.

2) The learning outcomes obtained by the pre-test and post-test have increased, analysis with N-gain in the medium criteria. Suggestions from researchers for students are that the developed media can be used as a source of learning independently.

References


Determinants Skills for Vocational Educators Success

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Abstract. Vocational education aims to developing the knowledge, abilities, skills and competence formation of each individual. Vocational education must have characteristics in which individual performance is oriented in the world of work, special justifications for needs in the industrial world, focus on curriculum development in which there are cognitive, psychomotor and affective aspects, benchmarks for success are not limited to academics but the development of skills, sensitivity the development of the world of work, especially those based on technology, requires adequate and adequate support facilities as well as the existence of human resources support. On the other hand, the biggest challenge in facing industry 4.0 by developing learning systems, education units, students, and the educators and education staff needed. The purpose of this research is to describe in depth the role of creative, critical and solutions thinking skills that must be possessed by vocational educators in the industrial era. This research is a quantitative research. Primary data in this study are the results of a questionnaire, while secondary data obtained through supporting documents that are the results of observation and interviews. This research was conducted in the civil engineering education department of UNNES. Data was collected through filling out questionnaires and then the data were analyzed using SPSS to find out how far the influence of creative, critical and solutions thinking skills on the success of vocational educators in learning. The results showed a significant influence between creative thinking, critical and solutive to the success of teaching learning process.

Keywords: creativity, critical thinking, Solving Problem, success.

1 Introduction

Vocational education is undergoing metamorphose very quickly. Vocational education is a work that is needed in the future. A person who graduated from vocational education must have some special skills to achieve success in the world of work later. No exception for prospective teachers from civil engineering education that is because later the workforce of civil engineering graduates is someone who masters a field that inherently broadly covers various technical fields that
contribute to infrastructure, public health, and safety. Civil engineers must have technical breadth and strong problem-solving skills in various technical fields from civil engineering disciplines [1]. Therefore when they are still prospective civil engineering teachers they need to master some skills, knowledge, and behavior [2].

Schools and companies will need a workforce that has competitiveness in the labor market; quality assurance requirements and soft skills; scientific and technological development [3]. Based on research results, a graduate from civil engineering and civil engineering education must have good interpersonal skills [4]. Engineering graduates face critical problems during the transition from university to an engineering career. Civil engineering graduates and civil engineering education experience problems when they work, especially when communicating and solving problems that are still rather slow [5].

Critical thinking is very important to be owned by a teacher because critical thinking is considered by some people as a meta-skill needed by humans in integrating practice and technology [6]. Even a civil engineering teacher must have strong, high cognitive, and good interpersonal skills [7]. Christian thinking becomes a bridge in facing the times that are so fast and full of challenges [8]. Critical thinking is not only the ability to summarize what reading is. Critical thinking is the ability to explain and evaluate an argumentation as well as analyze and conclude a problem and provide assumptions / assumptions. Critical thinking skills are basically competencies that are intertwined in which an individual can explain and evaluate arguments, critical questions, or discourse in terms of: (a) problem / question, (b) goals / objectives, (c) inference / argumentation, (d) evidence / information, (e) concepts / ideas, (f) nature of assumptions / assumptions, (g) types of assumptions, (h) implications / consequences, (i) point of view, and (j) criteria for reasonableness [9].

Creativity seems to be one of the core components of this new capability and is considered an asset for the development community. Although creativity is widely recognized as an Asset for the community, it remains a vague concept and there are many definitions of this competency in the literature [10] of teachers and business and education experts. The skills that must be mastered by students majoring in civil engineering education are learning skills and innovation (creativity,
critical thinking, communication, and collaboration), technological and digital skills, life and career skills (social and emotional competence to succeed in life and work environment). Creativity needs to be integrated in every curriculum in tertiary institutions [11]. Developing creative potential requires time and patience. If prospective teachers have creativity during college, the teacher will be able to integrate teaching that is more easily creative in the classroom.

One indicator of intellectual behavior is the ability to solve problems (problem solving)[12]. Civil engineering education students are expected to have adequate problem solving skills, so that they will help students solve academic and non-academic problems. In addition, with adequate problem solving skills will facilitate students in dealing with work situations that are full of various problems that must be resolved. The lack of problem solving skills in students is also shown by complaints from the world of work that many complain about college graduates who seem unprepared to face the world of work and are still often confused when faced with problems and are required to solve these problems. The lack of ability to overcome problems in the world of work is due to the quality of college graduates who are considered inadequate in terms of the ability to think divergent, which is needed in solving problems.

2 Method

The research approach used is qualitative by using descriptive research. The study was conducted at Education of Civil Engineering Department in UNNES. Researchers collected information from the students, then researchers analyzed the important factors to get success in world work. The primary and secondary research data collection techniques used unstructured interviews with student of education of civil engineering department. The instrument of this research consist of the following: (1) is creativity needed for civil engineering educator’s candidates? (2) Is critical thinking skill needed to mastering by civil engineering educators candidates? (3) Is problem solving ability needed to mastering by civil engineering educator’s candidates? (4) What is another factors should mastery by civil engineering educator’s candidates? It uses educators because they are considered to understand most of what researchers are expected to test the validity of data in the form of interviews. The study population consists of 40 civil engineering educators’ candidates. The
researcher uses triangulation technique on sources. To test the validity of the research instruments which were in the form observations, the researcher first determined what theory or concept will be used as a reference for the interview. The concept or theory is then categorized into several indicators used to serve as operational benchmarks. Regarding the reliability test in the interview instrument, there is more emphasis on the constancy of results raised by the sources. Reliability of observation instruments was based on rules/guidelines made by researchers and tracked at the time of observation. Data analysis technique from the data source of informants’ interview results of civil engineering educator’s candidates used field data analysis model of interactive analysis models from Miles and Huberman, where the stages of data collection, data presentation, data reduction, and conclusion are completed simultaneously with the process of collecting data and interacting with each other. On the other hand, data analysis of the results of observation was done through a checklist method.

3 Results and Discussion

Critical thinking, creativity and problem solving are the main keys to achieving success in the world of work. Based on the results of the questionnaire given shows that civil engineering education students argue affect success in the world of work, namely critical thinking has a role of 30%, creativity has a role of 25%, and problem solving that determines success in the world of work is problem solving has a role of 35%. While the remaining 10% is found there are other factors that influence the level of success when in the world of work.
Based on the diagram above, it can be analyzed that among the three skills analyzed, the results of the questionnaire show that critical thinking has an effect of as much as 30% in achieving success in the world of work, that is because critical thinking is needed in the world of work in providing arguments or analyzing things that need to be updated in the learning process. While creativity gets a percentage of 25%. High creativity can be useful when in the world of work to bring up ideas, ideas and innovations in the learning process, so learning becomes more enjoyable and students can absorb quickly the material presented so that student achievement can increase. Teacher's performance is very good. Problem solving gets a percentage of 35% higher than the other two skill factors. Problem solving is really needed in the world of work, because with very good problem solving skills can make decisions and solutions in every problem precisely and quickly. While 10% are influenced by other factors such as cooperation, good communication, networking, digital literacy skills. These other factors also require attention when lectured.

1. Critical Thinking

As prospective educators at the level of vocational education units apparently have to have very high critical thinking skills, because they can affect the level of success in the future. Critical thinking can be used to vary ideas about critical thinking that makes it difficult for educators to plan instructions for teaching and assess critical thinking in their students. The education curriculum is hinted at in all disciplines but does not appear to be fully formed [13]. Critical Thinking is emphasized in education, lecturers can provide repeated and varied exercises in thinking exercises
to prospective civil engineering education teachers, teaching students to analyze the difference between evidence and conclusions. The lecturer supports students to be bold in arguing in class discussions. The lecturer asks students to analyze the papers and correct if there is anything wrong [14].

These strategies can help students become more independent thinkers. Lecturers can regularly give questions to students in a Socratic way by exploring the various dimensions of their thinking, including their goals, the purpose of their evidence, reasons, data, claims, beliefs, their interpretations, deductions, conclusions, implications and consequences of their thinking, and responses they. Critical thinking has been defined philosophically and psychologically by many authors [15]. In fact, from a psychological point of view, critical thinking can influence the cognitive development of students and critical arguments that point to a problem [16]. Cognitive perspectives with high critical thinking skills will benefit when civil engineering education students organize instructional mental activities depending on their level of difficulty in the classroom context, analyzing problems, ability to organize and compare information, synthesis, gathering information and evaluating, and making information judgments [17].

2. Creativity

Introducing creative teaching in the classroom can bring benefits such as developing children's imagination [18] and increasing the probability for large discoveries and economic development for the future [19]. Creativity is also considered as an important component of personal well-being [20] and creativity can also develop curiosity, openness, and communication skills [21]. Creative and critical thinking are the two competencies that have received more and more attention this past year, especially, because of the need to develop information and communication technology in schools. In fact, the digital revolution brought new problems to education, in particular, the impact of new technologies means that changes in everyday life often occur and it is necessary for individuals to adapt to this situation. Also the use of the internet by children means they must choose information from various sources and know how to use information in a useful way.

3. Problem solving skills

Problem solving is a cognitive skill that is complex, and perhaps the most intelligent ability possessed by humans [22]. This is because when solving problems, students not only need to think,
but they need to think critically to be able to see a problem and think creatively to be able to solve the problem. Skills in problem solving need to be sharpened during the learning process, because later after being in the world of work, civil engineering education students will encounter many problems that must be given a solution immediately and appropriately. It cannot immediately appear but must begin to get used to since college. Skill and precise problem solving will greatly support their performance when in the world of work. Making policies and making decisions appropriately can remind their professionalism and have a good impact on the agencies where they work.

4 Conclusion

Critical thinking is needed in the world of work in providing arguments or analyzing things that need to be updated in the learning process. High creativity can be useful when in the world of work to bring up ideas, ideas and innovations in the learning process, so learning becomes more enjoyable and students can absorb quickly the material presented so that student achievement can increase. Teacher's performance is very good. Problem solving is really needed in the world of work, because with very good problem solving skills can make decisions and solutions in every problem precisely and quickly. In addition to the three dominant factors, there are other factors such as collaboration, good communication, networking, digital literacy skills. These other factors also require attention when lectured. All factors that influence the success of teaching staff in the work world can be integrated directly into the learning process in each subject, so students are ready to enter the workforce and have the provisions to achieve success in the work world.

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Strengthening the Professionalism of Lecturers Through Improving the Productivities in Publishing Articles

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{fathonah@mail.unnes.ac.id¹, adiet000@gmail.com², febrian.arif.budiman@mail.unnes.ac.id³, sitiayya55@gmail.com⁴}

Faculty of Engineering, Universitas Negeri Semarang¹²³⁴

Abstract: Professionalism of lecturers is shown by their ability in publishing articles in national and international journals. Journal publications are used for promotion, continuity of teacher certification, and research and service activity outcomes. The research aim to determine the factors that influence the productivity of the publication of the article lecturer of the Engineering Faculty. The research approach uses vacto exposure. The research subjects were 25% of FT lecturers as many as 38 lecturers. Factors that influence the publication of articles in journals known by structured questionnaire include english proficiency, publication method, administration cost, academic environment. The factors were analyzed by simple regression and multiple regression analysis. The result showed that 1) The productivity factors of publication of journal articles in the category are quite good with details of the average value of english proficiency 3.2, publication method 3.0, administration cost 3.0, and academic environment 3.4 (maximum score of 5); 2) The four factors partially and synergy significantly influence the productivity of article publications with p value = 0,000; 3) The multiple regression line for the productivity factor of the publication of the journal article Y = - 0.11 + 0.242 X1 + 0.260 X2 + 0.259 X3 + 0.243 X4. Research suggestions for strengthening professional lecturers require motivation and journal writing workshops with assistance, and the process of providing rewards is carried out thoroughly.

Keywords: strengthening the professionalism, lecturers, publishing articles

1 INTRODUCTION

In the Permenpan (The Regulation of Indonesian Ministry of State Apparatus Utilization) number 17 Year 2003 [1] paragraph 14 about the Functional Position of Lecturer and The Credit Point, the main academic duty of lecturers educating, researching, and conducting community service. The evaluating component for lecturer’s academic position is research (including the execution of research and producing scientific/technological/artistic/literary research). Besides, the Regulation of Indonesian Ministry of Research, Technology, and Higher Education Number 20 year 2017 [2] about the Lecturer’s Professional Allowance and the Professor’s Honorarium Allowance obliges lecturers who have an academic position as a Head Lector and
Professor to publish scientific research. The paragraph 4 clause 1 mentions that to improve the quality and the quantity of scientific research in Indonesia, in three years, a Head Lector should publish a. minimum three nationally accredited scientific journals; or b. minimum one internationally accredited scientific journal. For a Professor (in paragraph 8 clause 1), they should produce minimum a. three internationally accredited scientific journals; or b. one scientific journal in a reputable international journal. The scientific journal is called an article. The article is a text made by students, lecturers, researchers, and scientists in an academic context [3].

Besides, lecturers should have a publication as the output of their scientific activities and community services. The publication should be an article in a nationally accredited/internationally accredited/unaccredited national journal publishing [4]. In two years there is no significant professional improvement of lecturer in the Engineering Faculty. They do not get any accepted funding from the DRPM DIKTI (Directorate General of Research and Development for Higher Education) or DIPA of UNNES (Universitas Negeri Semarang’s or the Faculty’s Budget Implementation Checklist), except the activities for the community service form the funding of DPRM. In 2018, there are 18 researches and 9 community service proposals funded by DPRM, 18 researches and 7 community service proposals funded by DIPA UNNES, and 70 researches and 58 community service proposals funded by DIPA PNBP of the Faculty. In 2019, the number added into 19 researches and 5 proposals funded by DPRM, 30 researches and 36 proposals to DIPA UNNES, and 73 researches and 56 community services by the DIPA PNBP of the faculty. The total of the activities are added from 2018 to 2019, from180 to 219. The outputs of these activities are scientific journals, and ISBN proceedings [5] [6].

The obligation for publishing journals to the Lector and Professor is related to the motivation of increasing the quantity and improving the quality of the education in national and international level. The increasing number of the publication in the international and reputable international journal publishings will help Indonesia’s academicians to compete with other countries. Currently, the number of scientific journals in Indonesia is lower than many developing nations, even under the neighboring countries, like Malaysia, Singapore, and Thailand.

International publication through scientific journals is a medium of communication between researchers around the world to explain their most recent modern researches. In writing the journal, the authors should use proper writing in English. Moreover, they need two years to publish the journals with a high cost for the publication. The cost will be higher for the publisher which have strong citation index and impact factor, such as Nature and Science, Elsevier, Springer, Blackwell, et cetera. Prior researches found that the low number of the publication is caused by minimum understanding of how to publish, limited sources of funding, impatience in revising, and unsupportive academic environment. There is no any significant problem in the substances of the researches proposed by the authors [7]. Mudasir, a lecturer of the Faculty of Mathematics and Natural Science of UGM, mentions that there is a minimum award or appreciation from the university or faculty to publish. In addition, some articles are rejected due to limited scope, insignificant contribution, inadequate data, weak argumentation, and incorrect methodology [8].

From the problems above, it is known that Lecturers have the obligation to publish journals from the Permenpan Number 17 year 2013, Permenristekdikti Number 20 Year 2017.
They should also conduct research and hold community services. The lecturers, including the lecturers from the Engineering Faculty are **obliged to publish articles in a journal publisher**, whether in a national or a reputable international journal. Therefore, this research explores the influencing factors for the productivities of the lecturers in the production issues. From the exploration, the researchers expected to find solutions to strengthen the professionalism of lecturers from Engineering Faculty in publishing international journals.

## 2 RESEARCH METHODOLOGY

The subject of this research is lecturers of Engineering Faculty in Universitas Negeri Semarang. The researchers used ex-post facto and causal comparative research to dig the research problems. Then, the researchers describe the findings of the observations. Sugiyono explains that ex-post facto is an approach of observing something that has already happened to reveal the influencing factors of it [9].

The authors made a questionnaire which contains the productivity factor of the lecturer in publishing journals. The factors are 1) English proficiency, 2) publication methods, 3) administration cost, and 4) academic environment. The questionnaire is made in the responding scale of 1-5, which are 1) N/VP= Nonexistent/Very Poor, 2) F=fair, 3) M=moderate, 4) G=Good, and 5) VG=Very Good. Table 1 portrays the classification of the factors.

### Table 1. Classification of Lecturers’ Productivity Level

<table>
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<tr>
<th>No</th>
<th>Intervals</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.0 – 1.8</td>
<td>Nonexistent/Very Poor</td>
</tr>
<tr>
<td>2.</td>
<td>1.9 – 2.6</td>
<td>Fair</td>
</tr>
<tr>
<td>3.</td>
<td>2.7 – 3.4</td>
<td>Moderate</td>
</tr>
<tr>
<td>4.</td>
<td>3.5 – 4.2</td>
<td>Good</td>
</tr>
<tr>
<td>5.</td>
<td>4.3 – 5.0</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

Each factor are mentioned in a description and featured with the minimum and maximum score, average score, and standard of deviation. The researchers measured the influential possibility of the factors with simple regression analysis and multiple regression [10].

## 3 Results

Almost all factors have similar results within the research. All factors which influencing the productivities of lecturers in producing the journals are in the average of 3.0-3.4, or in the category of moderate (Table 2). The highest average is in the indicator of academic environment. The result specifically shows that the facilitation from the faculty exists, but it is not optimum.
Lecturers have moderate English proficiency level. They have the average score of 3.1 in the indicator of moderate capability in communicating in English, whether oral or written. However, proper English skills are needed to publish journals. Lecturers should concern on the grammar, formatting, reviewing process, and the plagiarism possibility of it. They usually have a problem in the long reviewing process. They also do not have any interest to send a publication to a predatory journal.

The administration cost for research and community service are usually come from the university funding or private funding. The support of the Engineering faculty are from the availability of online journal and learning sources to lecture. The faculty also supports the lecturers by holding group discussion, providing printed journals, and conducting a workshop for the lecturers. Somehow, the lecturers are not taking full advantage of it. They were also not taking the advantage from the helps of their peers.

The result of the simple and multiple regression analysis showed the significance of 0.000. The number shows that all indicators influence the publication number of journals. The coefficient of regression to each indicator are 0.660 for English proficiency, 0.759 for publication method, 0.696 for the administration cost, and 0.832 for the academic environment. The multiple regression obtained the constanta of 0.11, which means that the additional score in each criterion will decrease the score in 0.11.

### Table 2. The influencing factors to Lecturer’s Publishing Productivity

<table>
<thead>
<tr>
<th>Publishing Productivity Factors</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Rerata</th>
<th>SD</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Proficiency</td>
<td>1.0</td>
<td>4.5</td>
<td>3.2</td>
<td>0.76</td>
<td>Moderate</td>
</tr>
<tr>
<td>Publication Methods</td>
<td>1.0</td>
<td>4.5</td>
<td>3.2</td>
<td>0.81</td>
<td>Moderate</td>
</tr>
<tr>
<td>Administration Cost</td>
<td>1.0</td>
<td>4.5</td>
<td>3.0</td>
<td>0.87</td>
<td>Moderate</td>
</tr>
<tr>
<td>Academic Environment</td>
<td>2.1</td>
<td>4.6</td>
<td>3.4</td>
<td>0.61</td>
<td>Moderate</td>
</tr>
<tr>
<td>Publishing Productivity</td>
<td>1.5</td>
<td>4.4</td>
<td>3.2</td>
<td>0.66</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

### Table 3. The result of Simple Regression and Multiple Regression Analysis for the Factors of Publishing Productivity in Engineering Faculty

<table>
<thead>
<tr>
<th>Factors of Publishing Productivity</th>
<th>Sig partial</th>
<th>Sig synergy</th>
<th>Regression line</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Proficiency</td>
<td>0.00</td>
<td>0.00</td>
<td>$Y = 1.114 + 0.660 X_1$</td>
</tr>
<tr>
<td>Publication Method</td>
<td>0.00</td>
<td>0.00</td>
<td>$Y = 0.790 + 0.759 X_2$</td>
</tr>
<tr>
<td>Administration Cost</td>
<td>0.00</td>
<td>0.00</td>
<td>$Y = 1.095 + 0.696 X_3$</td>
</tr>
<tr>
<td>Academic Environment</td>
<td>0.00</td>
<td>0.00</td>
<td>$Y = 0.357 + 0.832 X_4$</td>
</tr>
<tr>
<td>Multiple Regression</td>
<td>0.00</td>
<td>0.00</td>
<td>$Y = -0.11 + 0.242 X_1 + 0.260 X_2 + 0.259 X_3 + 0.243 X_4$</td>
</tr>
</tbody>
</table>
The regression line in Table 3 is portrayed in Figure 1. The factors have the same pattern in a positive way. They have similar levels of coefficient of regression (0.66 – 0.83). The highest criterion is English proficiency as the most dominant (1.114) one in influencing the publication of articles, followed by administration cost (1.095). The value of Adjusted R square is 0.997, which means that 99.7% productivity of publication is explained from the English proficiency, publication method, administration cost, and academic environment.

Figure 1. Simple Regression Line for each indicator (English proficiency, publication method, administration cost, academic environment) with the factor of Publishing Productivity

4 Discussion

The lecturers in Engineering Faculty scored 3.1 in terms of English proficiency. They have a moderate English level, however, they do not apply it into their daily life. They should habituate writing in English at university. According to Spira, a language which is known by most people nowadays is English; therefore, people should use it as early as possible [11]. A research by a young urologist in Turkey shows that English proficiency and high level of publication is in line with the improvement of academic career [12]. English proficiency is highly needed in publishing articles. A research in Southern America proves that the lack of English proficiency can cause a loss of science in a workshop called as “English-Language Publication for Nonnative English Speakers” [13].

Engineering lecturers in UNNES do not send their paper to a predatory publisher. It is proven with the average score of 2.6. The condition should be maintained. Predatory journal is a publishing of journal which exploits the author. It opens a chance for the predator to charge
money for their service without any proceeding steps (expert judgement, editing, archiving, and indexation). The writer can send the journal into predatory publisher without concerning the quality of the journal. All lecturers in the faculty are recommended to choose publisher with a reputation of open access [14]. The impact factor of journal is important to academician [15] (Binns and Low, 2019).

The lecturer from Engineering faculty has already done anti-plagiarism check. They scored 3.4 or moderately good. The score reflects that the lecturers have the integrity to do that. Based on Suter and Suter [16] plagiarism can break the career of the writer. For an amateur writer, plagiarism is always be a problem in beginning their career.

The academic environment of Faculty of Engineering is moderately good. The environment is supportive for the lecturer to be productive in publishing articles. As in Bonaccorsi [17], a scientific community results valid knowledge in an evaluative and productive way. Besides, Binns and Low [15] suggests to evaluate the strategy of communication and publication of journal to be advantageous for the society in general. Apart from the support, there should be a workshop for the lecturers in academic writing. The result of a research in the formal postdoctoral program shows that there should be a clinical and translational knowledge given to the lecturer to improve their academic productivity in significant way in the speed of \( p=0.002 \) and H-index of \( p=0.013 \) [18]. Internet access is also important to browse relevant journals. Irawan et al [19] says that Indonesian journal should improve its accessibility, quality, and relevance for the sake of scientific development in the society, industry, and government.

All the factors above are supporting the publication level of lecturers. The factors should be supported continuously and constantly. Besides, lecturers should be active communicating in English whether in verbal or written to support their publishing level. Meanwhile, the faculty can help their environment by providing them with fast internet access. Personally, lecturers should be patient and persevering in applying journal’s formatting until they got their article published. The final publication can make lecturers more confident to write more article which eventually increase the number of invention [20]

Funding is a vital thing for a research and community service. The element allows all lecturers to do these obligations. The idea is relevant to the example of research about Benign Prostatic Hyperplasia (BPH). Due to excessive support, many articles about BPH can help the society [21]. Rewarding is important to motivate lecturers to publish in a reputable international publisher. The process of it should be careful only based on the merit.

They should be developed to optimize the publication in maximum level. The other research regarding publication shows that the obstacles of journal production are burdening working load, high administration price, limited subscription of printed journal, limited subscription of online journal, and limited access to printed journal [22]. The lack of technological understanding also inhibits lecturer to publish scientific journal [23].
5 CONCLUSION

All the productivity factors (English proficiency, publication method, administration cost, academic environment) of article publication by Engineering Faculty’s lecturers are moderately good. These factors have partial and synergical influence in the value of $p = 0.000$. The research also results the simple regression line on the multiple regression factor of $Y = -0.11 + 0.242 X_1 + 0.260 X_2 + 0.259 X_3 + 0.243 X_4$.

Based on the result, it is suggested to 1) motivate the lecturers to be active in writing articles, 2) provide workshop of article writing and journal publication for the lecturers, and reward the lecturers who published carefully.

REFERENCES


Batik Education and Competency Certification in Indonesia

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Abstract. Along with one decade of the inauguration of batik as the world intangible cultural heritage of humanity, various conservation efforts have been done, including education. Batik education and training programs are growing rapidly through formal, informal and non-formal education. For tourism, people introduce batik to foreigners in their workshop. Batik also becomes an excellent program in 30 of Textile Craft Vocational Secondary Schools spread throughout Indonesia including Papua, to create human resources in batik industries. Besides, batik workshops are also organized in non-formal education. At least there are about 33 Balai Latihan Kerja (BLK) the Competency Based Training under government and private organized batik program. Ministry of Industry as the leading sector of batik industry, also develop education and training program through Industrial Training Agency (BDI). To assure the professional competency of batik worker and worker candidate, certification is conducted by Professional Certification Authority or Lembaga Sertifikasi Profesi (LSP) Batik. This paper will analyzed all aspect about batik education and certification program in Indonesia.

Keywords: Batik, Education, Competency, Certification

1 Introduction

In 2009, when UNESCO recognized batik as the intangible cultural heritage of humanity origin from Indonesian, the batik industry resumed its rise from lost generation to a business with bright prospects. Batik industries in Indonesia, especially in Java was ups and downs along the centuries. Reached the golden age of the 9th to 20th centuries, and rapid development in 1970 till 1997, the industry suffered a setback caused by monetary crisis, followed by various natural disasters and riots in Indonesia. However, batik industry could survived the crisis compared to other industries, though some were collapse, some reduced their production, and some diverted their products. For example, In Yogyakarta as much as 1200 unit batik industries in the early 1970s, remaining to be only 400 industries survived. The same thing happened in various regions, up to 70 percent of the craftsmen members were no longer active as batik producers.

Start from 2007 batik industry rose from its downturn and adversity. Data from The Ministry of Industry said that batik sector is dominated by small and medium industries (IKM), has spread to 101 centers in Indonesia, with a total of around 47,755 batik industries in micro, small and medium scale exist in Indonesia spread in many areas, with 14% growth rate in 2019. Batik industry is a labor-intensive industry that is able to absorb up to 212,000 people, with a growth
rate of 18.98%. This figure can be compared with data from Indonesian Batik Craftsmen and Entrepreneurs Association or Asosiasi Pengrajin dan Pengusaha Batik Indonesia (APPBI) which noted that craftsmen who are members of APPBI are 151,565 people, while the number of batik industry 4393 industries consists of 502 (11%) large industries, 1279 (29%) medium industries and 2612 small industries (60%). Meanwhile, there are still around 10% of micro and small industry becomes members of the association (APBBI, 2020).

The batik industry gets development priority because it is considered to have a great leverage in the creation of added value and trade. Economically, batik products give the second largest contribution of 20-30% of gross domestic product (GDP) in the creative economy subsector. Evidently, the batik products produced have enormous opportunities for world trading, as a part of fashion. Batik leading in Indonesia product exports and contributors to foreign exchange through exports. Director General of Small, Medium and Various Industries of the Indonesia Ministry of Industry noted that exports from the batik industry during the first semester of 2019 reached US$ 17.99 million or around 253 billion Rupiahs. Over the past year, batik exports reached US$ 52.4 million or around 747 billion Rupiahs. Batik exports have penetrated a number of major destination countries such as Japan, the United States, and Europe. Besides, batik industry is part of the textile and clothing industry, which is one of the main sectors in the implementation of the Making Indonesia 4.0 road map. Batik industry received development priority because it was considered to have a large leverage in creating added value, trade, the amount of investment, the impact on other industries, and the speed of market penetration. With the world trade value of apparel products reaching a total of US $ 442 billion, the Indonesian batik industry has the opportunity to increase market share. In addition, the development of industry 4.0 and various advanced technologies and digitalization are expected to make the national batik world more competitive. Indonesian batik is also believed to have comparative and competitive advantages in international market competition.

Batik industry is a tough industries, it could pass any difficult situation. In the Covid-19 pandemic, Darmawan (2020) reported that sales of handwritten batik and stamped batik have decreased dramatically, where the loss reached 25 billion rupiah. However, creatively the batik businessman and entrepreneurs shifted the sales system from direct sales towards social media-based online sales. Batik production is partly diverted to the production of protective equipment such as masks, and the production of house clothing that can be used for work at home. Sales of house clothing increased.

Batik education becomes critical in relation to the development of industry 4.0, because education is a means for preparing human resources. As the cultural heritage, batik transferred from one generation to the next generation through oral tradition or in-formal education. Though this type of education were lasted for centuries, but proved was less successful in creating the new generation. After monetary crisis in 1997 there are lost generation in batik, since many of young people chose other profession which they consider more prestigious. One year after UNESCO recognition, batik began to be taught in schools, and included in the formal education curriculum starting from primary, secondary, to higher education. Syamwil (2010) states that according to the level of age development, there are differences in the material taught at each level. At the elementary school level, batik education is only at the awareness stage, at the junior secondary level, it is at the orientation and operation stage, at the high school / vocational level, batik education is at the vocational or occupational stage. The entry of batik into the education curriculum, is an effort to safeguard the sustainability of batik in Indonesia, and also aims at creating a competent workforce in the field of batik expertise.
The purpose of this study is to figure the current condition of batik workers, who are self-taught, or train in any school or training program, as well as mapping the competency gap of these batik workers.

2 Theoretical Background

The definition of competency standards in Indonesia as the description of competencies embracing knowledge, skills, expertise and work attitudes that are relevant to tasks and requirements of regulatory authorities [Peraturan 2007 Sayuti, 2015]. The policy of national competency standards (NCS) is discussed as an integral component of the broader policy of national qualification framework (NQF). The development of Indonesian Competency Standards was underpinned by four regulations, i.e. (a) Act Number 13 regarding manpower in 2003; (b) Ministerial Decree (KEPMEN) number 227 in 2003, 2004 and 2007; (c) Government regulation number 23 about Indonesian Professional Certification Authority (BNSP) in 2004; and (d) Government regulation (PP) Number 31 about national system for manpower training (SILATKERNAS) in 2006. The BNSP is the institution responsible for the development of the competency standards and for the certification of Indonesian Competency Standards.

3 Research Method

The objects of the research are the portrait of batik education in Indonesia, figured out kinds and level of education for batik, the position of competence workers as human resources, typical in gender and age, and the competency assurance for the workers. Data were collected through documents, observation, and open interview to the respondents consist of representative of Indonesian Batik Craftsmen and Business Association (APPBI), batik teachers and instructors, as well as some assessors from Batik Professional Certification Authority (LSP Batik). Data analyzed in qualitative approach.

4 Research Findings

4.1 Condition of Batik Worker Today

A decade ago, it was found that more than 85% of batik workers in some traditional batik centers were old people (over 60 years). However, in their old age, they are proven competent, such as in Bayat Klaten Central Java, there are number of woman aged over 80 years who are still competent in making handwritten batik. This condition foster worries about regeneration. From the gender aspect, 91.2% of handwritten batik were produced by female crafter, though it was also found some good male doing the job. Stamped batik crafter are generally male, but in Jambi, the stamping work was also done 90% by female crafter. Coloring batik with brush, known as coletan work are generally carried out by female, while dyeing are usually carried out by male and female respectively 50%. Canting pen and canting stamp makers are generally male and 70% of the younger generation have entered this job market, but there is also one
women who is competent in making canting stamp. The work of releasing batik wax is 100% done by male with varying ages. However in overall batik business is still dominantly controlled by female.

In the past, each batik maker must be able to work on batik from beginning to end. At that time, a batik crafter was able to make a motif, copy the motif onto the fabric, attach the batik wax to the cloth in accordance with the motif using canting, dye batik, and release the night. The creation of batik motifs is done through reflection and inner behavior. Although there is some work done together, but in principle every batik must be able to work on the entire batik process. At present, every step of batik process are done by different people. There are segmentation in the field of work, division of tasks, so that a piece of batik cloth is completed collaboratively. For example, there are some people who are competent in using canting for handwritten batik only, and know nothing about coloring or wax removing. A person could be very competent in designing batik motifs but do not competent at all in the work to make batik wax mixture. So there are specialization in task and duty.

In 2015, the only one and first authority for batik professional certification was formed, known as LSP Batik. The aim of is to give recognition and appreciation to professional batik workers in their field of work, refer to the Indonesian National Work Competency Standards (SKKNI Batik). Moreover, certification also aim to ensure the competence of 212,000 batik workers related to their competence. Information from LSP Batik shows that there are 14 certification schemes for professional referring to existing work specialization in batik sector, those are: (1) Batik Motif Drafter; (2) Batik Patern Maker; (3) Batik Motif Designer; (4) Handwritten Batik Crafter; (5) Stamped Batik Crafter; (6) Batik Wax Maker; (7) Synthetic Dyes Color Mixer; (8) Synthetic Color Dyer; (9) Natural Dyes Color Mixer; (10) Natural Color Dyer; (11) Wax Removing Worker; (12) Canting Maker; (13) Batik Stamp Maker; (14) Computer Based Batik Designer. Until 2019 LSP Batik has certified 71% batik worker out of 11.000 person who were joint competency assessment. From 29% declared not yet competent, a competency gaps or lack of skills to produce product which standard operation.

4.2 Batik Education and Training

The results showed that people study batik for different reasons. Some people do it for awareness, some do for livelihood, however there are also do it just for hobbies and happiness. Batik education and training programs are growing rapidly through formal, informal and non-formal education. Batik industries introduce batik to their guest or foreigner in their workshop, just for awareness. However, generally industries train their batik workers by their own, to meet their standard. Batik also becomes an excellent program in more than 30 of Textile Craft Vocational Secondary Schools spread throughout Indonesia including Papua, to create human resources for industries. Government and private organization facilitate the Competency Based Training for free in Balai Latihan Kerja (BLK) in every province, city and district in the effort to create new entrepreneur and worker. Ministry of Industry as the leading sector of batik industry, also develop education and training program through Industrial Training Agency (BDI). Certification process showed that only 72% SMK graduate are competent, while it was only 46% competent, and fulfill the minimum requirement of National Batik Professional Competency Standard (SKKNI). The gaps happened, since many of training and education programs did not use SKKNI as a curriculum reference.

Along with the growth of the industry and the development of batik trade to the export level, more and more people want to learn about batik. At first batik was taught by oral tradition, word of mouth, but now batik has entered the school curriculum generally in the form of local
content. Batik education is now a prima donna and something that attracts the interests of all walks of life. Tourism also offers batik tours to local and foreign tourists. Batik higher education programs have also been opened in several cities known as batik centers. For example, the Faculty of Batik which was opened at Pekalongan University, also in the form of polytechnics such as Pusmanu Polytechnic in Pekalongan. Some quality universities also open batik programs, such as Binus International, Semarang State University and other educational universities that have a Fashion Study program.

Batik education and training programs are growing rapidly through formal, informal and non-formal education. For tourism, people introduce batik to foreigner in their workshop. Batik also becomes an excellent program in 30 of Textile Craft Vocational Secondary Schools spread throughout Indonesia including Papua, to create human resources in batik industries. Besides, batik workshops are also organized in non-formal education. At least there are about 33 Balai Latihan Kerja (BLK) the Competency Based Training under government and private organized batik program. Ministry of Industry as the leading sector of batik industry, also develop education and training program through Industrial Training Agency (BDI).

Batik education development cannot be separated from vocational education concept i.e.: education for all, education for life, education for earning a living, inclusive education.  
1) “Batik Education for All” is one of the conservation efforts so that knowledge about batik is spread to various levels of society, various levels of education. In addition, batik knowledge must also be spread throughout the world. It can be said that batik education is intended to increase awareness of batik. This education for all comes in the form of local and extra-curricular curriculum in schools at elementary and junior high school levels. Or in the form of one day workshops or short-courses that are held in industry, at education centers, or at batik exhibitions. Simple knowledge and skills are taught here in a practical and fun way.

2) Batik Education for Hobby and Leisure, where batik program usually attended by retired people, or housewives to fill their leisure time and gain happiness for that.

3) Batik Education for Therapy, where the process of making batik is considered as fun and relaxing activity. Therefore doctors recommend to cancer survivors or those who are stressed to learn batik. The results have been proven, that some cancer survivors in Jakarta got their spirits up when given the opportunity to make batik in an easy way. They produce batik paintings on display at a batik festival.

4) Batik Education for Earning a Living, is the concept of vocational education or occupational education in the level of development, advancement and establishment. Syamwil and Soenarto (2010) state that batik education is included in the formal education curriculum as both local and extra-curricular content. in there are various vocational levels according to age and education level. At the kindergarten and elementary level, they are in the awareness stage, in junior high at the Orientation and Exploration level, SMK at the Development level, at the Higher Education Advanced stage, and while working at the Establishment Stage. This education is carried out for batik workers, according to their profession. Batik has becomes an excellent program in 30 of Textile Craft Vocational Secondary Schools spread throughout Indonesia including Papua, to create human resources in batik industries. Besides, batik workshops are also organized in non-formal education. At least there are about 133 Work Training Centers (BLK) of the Competency Based Training under the government and private organized batik program. Ministry of Industry as the leading sector of the batik industry, also develops education and training programs through the Industrial Training Agency (BDI). At the end of education and training, competency assessment and certification were conducted by LSP P1, P2, or P3.
5) Batik Education for Disability. This kind of batik training is inclusion in nature, where batik work can also be done by people with disabilities, to provide an opportunity for them to be able to live independently not dependent on others. Ani Ulfatus and Rodia Syamwil (2014) stated that people with disabilities can be trained in batik making with the assistance of experts. LSP Batik can also certify competencies for them with the help of experts.

5 Conclusion

There is a change in batik education which was initially informal in the family to formal and non-formal education. In forming and supporting the development of robust batik industry, they require professional and competent human resources or workers. Therefore, all formal and non-formal education must refers to the SKKNI in developing a competency-based curriculum. Certification was carried out by an independent institution namely LSP in the P1, P2, and P3 categories under BNISP supervision. Not all batik workers are certified. Only 71% of the 11,000 of batik workers who performed the competency test was passed the test.

References

The Analysis of Entrepreneurship Character of University Students in Supporting the Development of Business Incubator

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Abstract. With a business incubator, students will be easier to assist in developing a business, even becoming an alumni and also as a promotional event and meet the needs of the community. This study aims to describe the readiness of the entrepreneurship character of fashion students for the development of production units and the development of higher education business incubators. Quantitative research approach with a survey, respondents PKK study program students. fashion and catering and beauty using the purposive random sampling technique, with the method of collecting data through a questionnaire as an instrument then the data were analyzed with descriptive percentages. The results showed that the entrepreneurial character of students was at a very high criterion of 78% and a high criterion of 22%. The entrepreneurial spirit in this study included eight indicators representing self-confidence, initiative, achievement motives, leadership spirit, risk-taking, commitment, originality, and managerial skills.

Keyword: Entrepreneurship, Business

1 Introduction

To support the elevation of a State Higher Education to become a State-Owned Legal Education Service, there should be a supporting fund to the university’s administration. This institution is designed to maintain the businesses in the university and the surrounding community. That is to say, the university synergize its elevation within the importance of academic escalation and business development. Business incubator plays the role in improving the tenants’ performance, where it helps the Small and Medium Enterprises to increase the number of workers, turnovers’ rate, marketing areas, and autonomous access. The decentralization of education in Indonesia demands higher education to become a State-Owned Legal Entity or BHPT. The autonomy means that the university should be independent in terms of funding. The development of entrepreneurship in the university should grow with the support of academic goals in the Regulation Number 12 Year 2012 that it aims to produces human which is obedient and faithful to God the almighty with noble act, healthy life, knowledge, skills, independence, competence, and culture for the sake of the nation.
Universitas Negeri Semarang or UNNES as an internationally reputable university collaborates with UPSI of Malaysia. The collaboration focuses on the entrepreneurship. The reason behind this is UPSI has the department of Home Economics which focuses on the same fields with the Family Welfare department of UNNES. UPSI also has the entrepreneur unit of Culinary for the product of PAO, opens a beauty salon, and holds a fashion event. The collaboration of both universities focuses on the training, conferences, comparative study, and credit transfer.

This study is a form of research collaboration between both universities concerning on the empirical findings of students’ entrepreneurial behavior in developing business incubators. The research focuses on the mental readiness and characters. This research aims to describe the students’ characters and compare the characters of students in UNNES and UPSI.

2 Materials and Procedures

This research is a descriptive research. The researchers conducted a survey of one variable which is students’ entrepreneurial character. This research happens in both the Family Welfare Department of UNNES and the Home Economic department of UPSI. The researchers employed purposive random sampling to obtain the data. The size of the sample is based on the table of Herry King. The data of this research came from the questionnaires or surveys in a Likert-scale which is supported with interview, observations, and documentations.

3 Methods

3.1 Questionnaire

The questionnaire in this research contains opinion questions from set of statements to a Likert-scale in the range of 1-10. The data is in the form of interval. The score ranges from 1 as “completely disagree” to 10 as “completely agree”. The questionnaire faced a validity and reliability test before given to the respondents.

3.2 Interviews and Observation

This research uses observation sheets to support and validate the questionnaires and interviews.

3.3 Documentation

The researchers obtains related-documents of the research’s findings from the pictures or related files to the respondents of the research.

4 Data Analysis

4.1 Descriptive Statistics

After collecting the data, the researchers tabulated the data and preceded to the Descriptive Analysis. The analysis identified respondents’ personal data, such as age, sex, semester, major,
entrepreneurial experience, brand of their products, marketing medium, address. Besides, the analysis also showed students’ entrepreneurial characters. The formula of the descriptive percentage is as follows.

\[
P = \frac{f}{N} \times 100\%
\]

\(P\) = Percentage of Answers  
\(f\) = Obtained Score  
\(N\) = Total Score

### 5 Results and Discussions

This research utilized descriptive percentage to analyse the findings. The data show that the students of Family Welfare Department scored 74.46% for their entrepreneurial behavior. The description of the result is displayed in Table 1 as follows.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Criteria</th>
<th>Frequencies</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>81.25% &lt; skor &lt; 100.00%</td>
<td>Very High</td>
<td>22</td>
<td>19.64%</td>
</tr>
<tr>
<td>62.50% &lt; skor &lt; 81.25%</td>
<td>High</td>
<td>86</td>
<td>76.79%</td>
</tr>
<tr>
<td>43.75% &lt; skor &lt; 62.50%</td>
<td>Low</td>
<td>4</td>
<td>3.57%</td>
</tr>
<tr>
<td>25.00% &lt; skor &lt; 43.75%</td>
<td>Very Low</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>112</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

The findings in the table is also portrayed in the following diagram.

![Fig.1. Students Entrepreneurial Character](image-url)
Table 1 and Figure 1 show that from 112 students, 22 scored very high (19.64%), 86 scored high (76.79%), and 4 scored low (3.57%). The indicators of the entrepreneurial characters are confidence, initiatives, achievement-oriented, leadership, risk-taking, commitment, originality, and strong managerialism. The depiction of these aspects are projected in Table 2 and Figure 2.

Table 2. The indicators of students’ entrepreneurial characters

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>8.07%</td>
</tr>
<tr>
<td>Initiatives</td>
<td>10.29%</td>
</tr>
<tr>
<td>Achievement-oriented</td>
<td>11.69%</td>
</tr>
<tr>
<td>Leadership</td>
<td>8.39%</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>8.44%</td>
</tr>
<tr>
<td>Commitment</td>
<td>8.73%</td>
</tr>
<tr>
<td>Originality</td>
<td>8.67%</td>
</tr>
<tr>
<td>Strong Managerialism</td>
<td>10.19%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>74.46%</strong></td>
</tr>
</tbody>
</table>

The findings in the table is also portrayed in the following diagram.

![Diagram](image)

**Fig 2.** The indicators of students’ entrepreneurial characters

Table 2 and Figure 2 show that students got 8.07% for confidence, 10.29% for initiatives, 11.69% for achievement-oriented, 8.39% for leadership, 8.44% for risk taking, 8.67% for originality, and 10.19% for the managerialism. The highest score is the achievement-oriented, and the lowest one is the confidence. This research was conducted to students of Entrepreneurship unit in the year of 2014, 2015, 2016, and 2017. The pictures of students’ level of entrepreneurship in each batch is reflected in the table and figure as follow
Table 3. The entrepreneurial characters of students in each batch

<table>
<thead>
<tr>
<th>Year of entrance</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>73.49%</td>
<td>High</td>
</tr>
<tr>
<td>2015</td>
<td>74.25%</td>
<td>High</td>
</tr>
<tr>
<td>2016</td>
<td>74.22%</td>
<td>High</td>
</tr>
<tr>
<td>2017</td>
<td>75.56%</td>
<td>High</td>
</tr>
</tbody>
</table>

Fig 3. The entrepreneurial characters of students in each batch

Table 3 and Figure 3 show that all students in four batch have high level of entrepreneurship spirit in the details of 73.49% for the 2014 batch, 74.25% for the 2015 batch, 74.22% for the 2016 batch, and 75.56% for the 2017 batch. The highest score was obtained by batch 2017, while the lowest one is in batch 2014.

6 Conclusions

The students of Fashion department in UNNES has high entrepreneurial characters in the score of 76.79%. The indicators of the characters are confidence, initiatives, achievement-oriented, leadership, risk-taking, commitment, originality, and strong managerial skills. From the comparative study, students of UNNES scored higher than UPSI in the percentage of 75.56% and 73.49% respectively.

7 Acknowledgements

The authors would like to thank those who were involved in this research, DIPA of the Faculty of Engineering and the Department of Chemical Engineering, Universitas Negeri Semarang for funding of this research.

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Tri Siwi Agustina .2015. Peran Inkubator Bisnis Perguruan Tinggi Dalam Meminimalkan Resiko Kegagalan Bagi Wirausaha Baru Pada Tahap Awal (Start-Up) Majalah Eco Nomi Tahun Xxi, No. 1 April 2011


Model Of Assessment For Learning Based On Higher Order Thinking Skills For Computer Network Learning For Students Of Vocational School

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Abstract. Vocational High School (SMK) as one of the vocational schools plays a strategic role in fulfilling the workforce. One of the competencies that must be possessed by vocational graduates is the ability of HOTS. Many SMK graduates are not absorbed into the industry because they don't have HOTS ability. This study aims to develop AFL model based on HOTS that can be applied to the learning of computer network for vocational high school students. This research is a development research using the HC-ADDIE modification model, which is collaboration and modification of Hopkins and Clark's research, development and diffusion model of the ISD ADDIE and classroom action research (CAR) models. The development stage involves the activities of the design prototype model, validating models, readability testing, training teachers/observers, and conducting limited and expanded trials. The results showed that AFL model based on HOTS of computer network learning for students of vocational high school were successfully developed through the HC-ADDIE modification model.

Keywords: AFL, HOTS, computer network learning, students of vocational high school.

1 Introduction

Vocational High School (SMK) is a formal education that aims to prepare students to enter the workforce, prepare students to master the knowledge, skills, attitudes and values needed by the workforce [1]. SMK graduates are required to be able to work independently, have a professional attitude in the area of expertise they are interested in and have competence in accordance with the chosen expertise program.

The fact is that SMK graduates have not been able to answer the labor problems needed by the workforce (Alimudin et al., 2018). Moreover, if we look at BPS data as of 2018, South Sulawesi Province ranks the 6th highest SMK Open Unemployment Rate which is 12.48% even above the national average of 11.24%. For example, the number of alumni especially in the Department of Computer and Network Engineering produced by a number of favorite SMKs in South Sulawesi also shows a sad phenomenon, namely those who work in accordance with the background of expertise taken at SMK not more than 5% of the average graduate. Even though this subject of expertise is a very favorite major in SMK. Can we predict how the conditions of other schools. On a national scale, the majors of computer engineering and informatics occupy the third position of contributors to unemployment alumni in 2018, amounting to 228,554 people.

One obstacle of acceptance of vocational graduates in the world of work is the ability to think at a high level. This is consistent with the opinion of Delise, Rose and Nichole that the
ability to think and work at a high level is one of the competency requirements that must be possessed in the world of work [2], [3]. The ability to think at a high level is now known as Higher Order Thinking Skills (HOTS).

**Higher Order Thinking Skills**

At present, the design of learning in vocational schools has been directed to HOTS. One reason is that the construction of National Examination questions continues to be improved so as to measure students' abilities in the higher cognitive domain ... "[4]. On the other hand, many vocational teachers still use low-level thinking skills (LOTS) assessments, which only facilitates students in short-term memory [5]. This phenomenon is not only a local problem, but also a global problem. There are international concerns about the dominant practice of LOTS assessment which only encourages students to focus on learning that emphasizes rote learning [6]. As a result, graduates are less skilled and lack high-level thinking skills to solve problems in their lives [7] (Yee et. Al., 2015).

Vocational schools must also be able to prepare graduates to be able to enter the workforce according to specified requirements. Cotton [8] and Robinson [9] state that in order to enter the workforce, prospective workers must have the readiness, abilities, and skills required by the workforce (employability skills), one of which is HOTS. According to Robinson (2000: 3), by having HOTS, a person will be able to learn, provide reasoning, think creatively, make decisions, and solve problems (problem solving).

Some of the capabilities mentioned above can be achieved if someone is able to apply knowledge, analyze problems, evaluate problems, and arrange alternative designs of problem solving based on the knowledge and understanding they have. Some indicators of this ability are summarized in HOTS, so this HOTS must be owned by all students including computer and network engineering students. Therefore, the development of HOTS has become a very important matter in the educational curriculum for computer and network engineering students.

**Assessment For Learning**

At present, the design of learning in vocational high schools has been directed to HOTS, so the development of HOTS assessments is a priority. Assessment is a process that is carried out as a step to evaluate the performance of the whole system, analyze the effectiveness of teaching, and obtain information within the decision making framework of students aimed at improving the quality of learning [10].

The assessment process in Vocational High Schools must be carried out on all aspects of student ability so that the results of the assessment have meaningfulness for students, both to enter the workforce and to continue their education to a higher level. This is in accordance with Indonesia Minister of Education and Culture Regulation No. 66 of 2013 concerning Educational Assessment Standards, stating that the scope of assessment of student learning outcomes includes attitudes, knowledge and skills competencies that are carried out in a balanced manner so that they can be used to determine the relative position of each student to the standards that have been set. This was agreed by Brookhart [11] that by conducting regular HOTS assessments, there would be positive developments in their students, namely thinking skills and performance would increase overall.

Learning in Computer and Network Engineering In general, vocational students' thinking skills are still low. When doing exercises, students can do a good job based on teacher demonstrations and worksheets. But when they find an error, they have not been able to analyze the cause of the error (the C4 analysis level), evaluate the error steps (the C5 evaluation level) and make a solution to manage the error (the C6 creation level). The biggest problem faced by
students is the difficulty in generating ideas [12]. This pattern is the same as research which states that the highest learning styles in vocational students are perpetrators and the lowest are thinkers [12]. Therefore, it is necessary to think about how the HOTS development strategy of computer and network engineering students is.

Assessment with these characteristics has advantages such as being able to detect weaknesses and strengths of students, being able to detect positions of students’ abilities in learning based on criteria not compared to other students, involving teachers and students in the implementation process, and can assist teachers and students in achieving learning goals which are expected. In addition, assessment can foster motivation, responsibility, self confidence, independence, honesty, and student achievement in learning [13]. It was agreed by Yusuf that the function of assessment is as a provider of information and quality control of education, which includes all components of education starting from the implementation process to the educational product [14].

The development of HOTS computer and network engineering students is a demand that must be done immediately, bearing in mind the characteristics of work in computer and network engineering is to produce or produce products related to the world of networks that require critical and creative thinking skills. This is because in general the installation and configuration process requires a long problem-solving process and that is: (1) compiling network concepts; (2) designing a network that includes making topology and making network design; (3) selection of materials (raw materials); (4) determination of the technology used; (5) installation and configuration process; and (6) testing; Therefore, students as computer and network engineering must be ready and able to master well in accordance with the demands of the global world.

Based on the description above, it can be said that an increase in assessment of student learning outcomes can be done by developing a HOTS-based assessment model. Therefore, this research was conducted to develop a HOTS-based assessment model for learning computer and network engineering for students, which included designing prototype models, model validation activities, model readability tests, teacher training / observers (lectures and observers training), and model trials both limited and

2 Method

Step 1: Research

The stages of research in this study include the following activities: (a) problem analysis; and (b) needs analysis based on the results of a preliminary study of HOTS, learning motivation, positive attitudes and behavior of students, curriculum (syllabus, lesson plans, learning materials, and assessment systems) and theoretical and empirical studies of related theories and research results with HOTS, assessment systems, AFL, vocational education, & the demands of the global world.

Step 2: Development

Based on the results of the research stage, the next stage of development is carried out. This stage of development was carried out to produce a model and set of HOTS-based AFL model instruments for learning computer and network engineering for students, which included designing prototype models, model validation activities, model readability tests, teacher training / observers (lectures and observers training), and model trials both limited and
extended trials using a classroom action research (CAR) approach so as to produce a HOTS-based AFL model that is good, fit, and feasible to use.

**Step 3 : Diffusion**

The diffusion stage is the final stage of this research which includes the dissemination of development models that are intended to disseminate the results of this research either through socialization in the form of publication of research results in the form of research seminars, national and international seminars, and journals.

### 3 Results

**Step 1 : Research**

**Results of the Preliminary Study Review**

HOTS vocational education students in the field of computer networks which include the ability to apply, analyze, evaluate, and create in general are still quite low so it needs to be improved and developed. This is indicated by the low ability of students in terms of applying theories to solve problems, thinking critically, giving reasons and logical arguments, solving problems, making decisions, and arranging concepts and designs / designs in the process of creating new products when students complete assignments given by the teacher. Most students also experience difficulties when writing or compiling scientific papers. This was apparently due to the lack of time to read and was not accustomed to using the ability of HOTS during the learning process and in the process of completing assignments / questions.

**Results of Theoretical and Empirical Studies**

The development of HOTS, learning motivation, positive attitude and student motivation in the field of computer networking are very important. Therefore, learning strategies and teaching models in the field of computer networks in SMKs must be able to develop HOTS, learning motivation, positive attitudes and student motivation, in order to produce pious, intelligent, and independent learning outcomes and be able to bring increasingly complex global challenges. HOTS development, learning motivation, positive attitude and student motivation can be done by applying HOTS-based AFL in the process of learning computer networks in the classroom as an effort to prepare the workforce needed in the 21st century.

**Results of Problem Analysis and Needs Analysis**

The results of the problem analysis show that: (1) vocational students in the field of computer networks still have HOTS which is quite low, even though students should already have HOTS high enough to be able to face the challenges of an increasingly complex global world; (2) students also still have low motivation to learn, positive attitudes and behaviors, even though this aspect is very important to support the success of student learning; (3) learning strategies and assessment systems that have been applied so far have not been able to develop HOTS, learning motivation, positive attitudes and positive student behavior even though they should have been developed both through the learning strategy and the assessment system; (4) in the learning process in the field of computer networks have not yet integrated the assessment model that is as an assessment for learning (AFL) for the purpose of developing HOTS, learning motivation, positive attitudes and behavior of students while actually being developed through the application of AFL in classroom learning; (5) most of the questions / assignments given by the teacher still measure students' cognitive abilities at a low level (low order thinking skills, LOTS), whereas at the student level the questions / assignments should have measured and developed students' cognitive abilities at the level higher (higher order thinking skills,
HOTS); and (6) HOTS-based AFL models for computer network learning for SMKini students do not yet exist, so it is necessary to develop a HOTS-based AFL model for computer learning so that they can be immediately applied in classroom learning as an effort to develop HOTS, learning motivation, attitudes and behavior positive students and improve and improve the quality of learning in the computer field in college.

Step 2: Development

Results of HOTS-Based AFL Model Development

Fig. 1. HOTS-based AFL models in learning computer networks
Fig. 1. Results of Observation of the Application and Implementation of the HOTS-Based AFL Model

<table>
<thead>
<tr>
<th>Siku</th>
<th>Jumlah Skor</th>
<th>Skor-rata (%)</th>
<th>Keterlaksanaan Model</th>
<th>Rata-rata</th>
<th>Ket</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rater 1</td>
<td>Rater 2</td>
<td>Rater 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UT</td>
<td>22</td>
<td>79</td>
<td>24</td>
<td>86</td>
<td>24</td>
</tr>
<tr>
<td>UP</td>
<td>28</td>
<td>100</td>
<td>28</td>
<td>100</td>
<td>28</td>
</tr>
<tr>
<td>Rata-rata</td>
<td>24</td>
<td>88</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Keterangan: DTDB = dapat terlaksana dengan baik
UT = Ujicoba Terbatas; UP = Ujicoba Diperluas

References

Improving Students’ Learning Outcomes in Advanced Fashion Design Course by Using Portfolio Instrument

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Universitas Negeri Semarang ¹,²,³,⁴,⁵,⁶

Abstract. In the instructional process, there are so many activities, before the lesson begins, during the lesson and after. After the lesson the lecturers always do the assessment. The developing portfolio as an assessment was one of many assessment techniques in Advanced Fashion Design Course. The aim of the study was to find the improving students learning outcome in Advanced Fashion Design Course by applying portfolio as an assessment instruments. The research method was experiment design. By using pretest-posttest design the research was conducted. The data was analyzed by using descriptive percentage and gain score. The students’ outcome before the experiment was 70.26 % and after 80 %. By using gain score to analyze the improving the students’ outcomes were 0.33 it was medium category. This was because students were not familiar with portfolio as an assessment and lack of discipline in submitting the assignments.

Keywords: Improving, the students’ learning outcomes, Advanced Fashion Design, portfolio.

1 Introductions

The Fashion Education study program in addition to preparing graduates to become teachers at vocational high schools, also prepare graduates to work as fashion designer who can work independently as fashion designer or work in fashion industry, and entrepreneur. The Fashion Education is one of Study program in Department of Family Welfare Education. There are 4 study programs in Department of Family Welfare Education, Fashion Education, Culinary Education, Cosmetic Education and Family Welfare Education. The Fashion Education study program began in 2014, previously a expertise program in The Family Welfare Education Department. After the students finished their study, they have some qualification such as professional skill in fashion, teaching, concerned about environmental, social and culture [1]

There are many courses in Fashion Education Study Program, including Pattern Making (manual and computerized), Basic of Fashion Design, Fashion Design, Fashion Trend, Clothing Technology, Draping, Fashion Complement, Fashion enterprise and Ultimate Service, Advance Fashion Design, and other. One subject which prepares the students to be a fashion designer is Advanced Fashion Design. All of the subjects need a good instructional process. In the instructional process, there many activities, before the lesson, include lesson plan, preparing evaluation instrument, instructional media, during the lesson, the lecturers always do the assessment. The assessment of students’ learning outcome is basically an integral part of the
instructional process, which needs to be directed to assess student performance [2]. There so many instruments can be used in assessment the students outcomes, one of the way in assessments are applying portfolio as assessment instrument. The portfolio can be used at various level of education [3], it can be used as self-assessment [4].

The impact of portfolio in the research by Scartabello, Abate, Slimak, can develop students’ self-assessment skill, it can be improvements and can be extrapolated to students on many academic disciplines [4]. The assessment portfolio model is suitable for subject that requires students learning out puts in terms of knowledge, skill and attitude [5].

This assessment is in the form of an assessment of a group of students’ works that are systematically arranged and organized which are taken during the learning process within a certain period of time. Therefore teachers should use this assessment so that the quality of learning can be improved.

In Advance Fashion Design course, the students are required to create various design for various occasions, based on analysis of fashion from time to time. These assignment are collected and assessed using a portfolio as instrument.

The aim of the study, was to know the improving students’ learning outcomes in the Advanced Fashion Design course by using portfolio as assessment instrument.

2 The Portfolio in Advanced Fashion Design

The Advanced Fashion Design course is one of the subjects in Fashion Education study program. Some of the subjects are offer to the students. One of the subjects is Advanced Fashion Design. The Advanced Fashion Design consist of several topics, including: fashion proportion, design development from part of clothing, fashion analysis, creating new design based on fashion analysis, fashion design portfolio, collection creating, and designing based on films local or international.

The abilities that be mastered by students after attending the Advanced Fashion Design course were: Fashion illustration concept, drawing body proportion without measuring instruments, skilled at developing designs by imitating and arranging (stylists), analyzing the form of fashion from the past until now by research, compiling collection, creating fashion designer portfolio and drawing fashion for promotion manually or digitally for various fashion businesses.

In Advanced Fashion Design instructional process starts with planning, actuating and evaluating. In evaluating process always needs instrument for assessment. There are several evaluation instruments. Portfolio instrument is one of instrument in assessing students work individual or classical in period for a teaching material.

In general, a portfolio is a collection of document of a person, group, institution, company, organization which documenting the progress of a process in achieving predetermined goals [5]. Now a days the portfolio is recommended type of assessment which can be used by teacher at school [6]. The portfolio provides several benefits for teacher [7] including the teacher will concentrate of development rather than on the final results. The portfolio can be used by students to collect all documents relating to the science that are learned both in the classroom and outside the classroom, including outside of school [8]. At the end of period of work is collected and assessed the lecturers and the students themselves.

The advantages of portfolio lie in its ability to increase student activity, because motivation can increase. The condition makes students feel more value, so that their motivation to learn
increases. The portfolio can describe the continuity of student progress rather than snapshot of students’ outcome in single occasion test [6]. The disadvantages lie in the difficulties of matching students’ environmental condition when taking grades, even though the assessment takes place over a long period of time. The weakness also lies in the higher cost, time requirements which are more complicated because of comparing the work of one student from time to time, the lecturer also compares the result between the students.

The application of the portfolio in Advanced Fashion Design course, was giving assignments to the students, including the objectives, materials, assignment to create some new fashion designs, then conducting an assessment. The assessment was carried out by the lecturer with assessment criteria in fashion design, including body proportion, inspiration, fashion drawing technique, creativity, coloring, type of fashion, cleanliness, discipline.

3 Research method

Fashion Education Study Program students were the samples in this research, consisting of 4th semester students, totaled 27 people. By using pretest-posttest experiment design the research was conducted.

The first analysis used percentage descriptive [9] and the second analysis used gain score. The gain score analysis is used to determine the increase of students’ learning outcome in the Advanced Fashion Design course [10]

The first data analysis

\[ P = \frac{f \times 100 \%}{N} \]  \hspace{1cm} (1)

Where:

- \( f \): Subject frequency
- \( N \): Total number [9]

The second data analysis

Gain score analysis was used in this research, to determine the increasing of students’ outcome in the Advanced Fashion Design course.

\[ (g) = \frac{[\% (S_f) - \% (S_i)]}{[100 - \% (S_i)]} \]  \hspace{1cm} (2)

Figure 2. Average Gain Formula

Where:

- \( g \): Gain score
- \( S_f \): final test (post)
- \( S_i \): initial (pre) test
4 Research result and discussion

4.1. Research result

The results of the research, by using descriptive analysis, showed the students outcome in Advanced Fashion Design course, before and after being given learning by applying a portfolio as an assessment instrument, were 70.26% for the pretest and 80% for the posttest, as shown on table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Pre-test and Post-Test</th>
<th>Persentasi</th>
<th>Kriteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre - Test</td>
<td>70.26 %</td>
<td>Baik</td>
</tr>
<tr>
<td>2</td>
<td>Post - Test</td>
<td>80 %</td>
<td>Baik sekali</td>
</tr>
</tbody>
</table>

(Research data)

The result on the table above, then to determine the increasing students’ outcome in Advanced Fashion Design, used gain-score analysis, obtained 0.33 including the medium category (medium –g criteria)

4.2. Discussion

The result showed the pre-test was 70.26%$ in the good category. This was because the Advanced Fashion Design course was the third subject in Fashion Design in Fashion Education study program. The first was Basic Fashion Design, Fashion Design. The third was Advanced Fashion Design. However, there are still deficiencies, when viewed from body proportion, application of design element and principles, selection of source based on fashion analysis, understanding of fashion style, presentation techniques still need a lot of practice.

During the learning process, in 3 credits of semester, the duration of the lecture was 6 x 50 minutes, it was hope that students could develop the creative design. The students outcomes in post-test was 80%, in good category. The higher score was 86 and the lowest score was 72. The improving of students’ outcome was 0.33 based on the gain-score analysis, it was medium category. This showed the increase from pre-test to post-test score was not so high. It can be higher in the future time by improving learning facilities and infrastructure, providing motivation for students, that to become fashion designers must be proficient in developing ideas based on everything in this world.

The study conducted by Nurhayai and Yulistiana, contributed to learning, titled ribbon embroidery competent in the subject of decorating clothes at SMK Budi Utomo Perak Jombang, was successful, by applying the portfolio as assessment, the study was successful. The average
The higher score was 91 and the lowest was 70. This showed that portfolio can be used as an alternative evaluation tool in the subject of Fashion Decoration. It can even be applied to other subjects [11]. The portfolio assessment can increase students’ English motivation, this finding can help the lecturer improve their pedagogical skill, help the students, while helping to increase their students’ learning outcomes [12]. The use of a portfolio-based learning model can improve students learning outcomes and learning activity [13].

The portfolio instrument can improving students’ learning outcomes in Advanced Fashion Design course, based on the analysis data and some researcher results. Assessment portfolio apart from being carried out by lecturers, parents, and students. In this research the parents did not do the assessment, because the parents live outside the city of Semarang, only the lecturer did the assessment.

5 Conclusion
There was improvement in students’ learning outcomes in the Advanced Fashion Design course by using the portfolio as an assessment tool
The overall improvement students’ learning outcomes was 0.30 including in the medium category.

References
Students’ assignment in Advanced Fashion Design

Designed by Wirda and Siswanti Ade
Analysis of Implementation of Fashion Learning in SMK Thailand and Indonesia
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Fashion Design Study Program, Home Economic Department, Technic Fakulty UNNES

Abstract. Education system between countries is not the same, each has a vision and mission in accordance with the interests of a country’s human resources. The curriculum is created and developed to meet and answer the needs of the community for education and as a reference in learning. This study aims to analyze the implementation of fashion learning in the home economics department at the Luangprathanratnikorn Industrial and Community Education College Thailand school and at the fashion design expertise vocational school in Kota Semarang. The method of collection by interview is supported by documentation and observation. The results showed that learning to fashion learning based on the 2008 curriculum in Thailand supports the decentralization of education so that it focuses on intensive academic assessment by the school as well as through a national exam. The learning activities of fashion are theoretical and practical, emphasizing the objectives to be achieved, and the competencies that must be met and applying technology to be one of the educational goals. Students design products according to their creativity and practice in school. Learning in the Fashion Management expertise program at SMK N 6 Kota Semarang is based on the implementation of the basic core curriculum 2013 which must master compulsory and vocational group subjects (basic fields, basic competencies and vocational competencies). The teacher implements according to standard processes including, planning the implementation of learning, implementing the learning process, and evaluating learning outcomes. Learning activities are emphasized to be able to think critically or have HOTS (High Order Thinking Skills) and use scientific learning. Learning activities also include practical activities and theory using project-based learning methods supported by teaching factory. Assessment is carried out by the school, academics, industry and also through national examinations.

Keywords: Analysis, Curriculum Implementation, Learning, Fashion, Thailand, Indonesia.

1 Introduction

Each country has an educational goals, each of which is demonstrated by the existence of educational standards that must be achieved by every educational institution in any country, especially in Indonesia and Thailand, both of which are ASEAN member countries. The curriculum is an important reference that must be implemented during the learning process. The application of the curriculum in learning is an attempt to create directed, structured, effective and efficient learning activities. The application of the curriculum is carried out at all levels of education, by utilizing various elements contained in the curriculum, namely teaching materials, experiences, learning processes, learning competencies, and evaluation tools in the implementation of learning.

Vocational schools in Thailand have the same level as vocational schools in Indonesia, with a vision of creating a skilled workforce in accordance with their respective fields. Vocational education curriculum is developed by always referring to the principle of Relevance.
relevance of the curriculum is interpreted as the adaptive curriculum (Sanjaya, 2008). The curriculum has a function as an adjustment. The meaning of adjustment is the curriculum must have the ability to adjust to the development of society, science, technology, and the needs of the workforce. The development of the world of work is dynamic and changes rapidly in accordance with the development of science and technology. Relevance will connect the potential of existing employment and the ability of graduates to meet the requirements of the job. If graduates from vocational education cannot meet the requirements and needs that have been set employment, then vocational education is considered "failed" (Canavan, 2005; Hodge, 2011; Miller, 1985). Rapid changes in the world of work suggest that the curriculum needs to be constantly reviewed to see if there is still a match between what is taught in schools and the needs of the world of work. This relevance becomes a very important word to achieve the goals of vocational education itself. Vocational education curriculum must be designed according to the needs of the world of work. Vocational education curriculum and the needs of the world of work must have the principle of go hand in hand (Miller, 1985; Oloruntegbe, 2010). Vocational High Schools (SMK) as an important part of the vocational education system has the goal of "..... preparing students especially to work in certain fields". (National Education System Law No. 20 of 2003 article 15). The Education Attache of the Indonesian Embassy in Bangkok (2014: 6) stated that the opportunity for those who had worked to obtain a certificate of expertise was very open. Because of this need finally created a curriculum in Thailand 2008 which was formulated to provide opportunities for local communities and schools to take a role and orientation in preparing the school curriculum.

The Luangprathanratnikorn Industrial and Community Education College applies the 2008 curriculum in all of its educational studies, including vocational home economics. Halima Sidi (2014: 55) states that vocational home economics is a skill-oriented field of study that equips students with marketable skills that make them independent / self-employed. The subjects given in home economics vary greatly, including arranging flowers, decorating, cooking, sewing, and many others. One of the learning materials provided is making a mini dress in advanced sewing subjects. State Vocational School for fashion expertise in Semarang is SMK N 6 Kota Semarang, which applies the 2013 curriculum and implements teaching factory.

The formulation of the problem in this study are 1) how the implementation of sewing learning in Luangprathanratnikorn Industrial and Community Education College. 2) How is the implementation of learning to sew fashion in State Vocational School 6 according to the applicable 2013 curriculum.

2 Research methode

This study uses a qualitative research approach analysis method. Mills Haberman in Moleong Farida (2014: 23) which bases itself on natural paragraphs that focuses on efforts to find new elements of knowledge that did not exist in previous theories. Qualitative research refers to the analysis of non-mathematical data by collecting data through various means, namely interviews, observations, documents or archives, and tests. The validity of the data is determined using the triangulation method based on data sources, theories, and data obtained in the field.
3 Results and Discussion

The curriculum is an educational program not a teaching program, which is a planned, programmed, and designed program that contains a variety of teaching materials and learning experiences both from the past, present and future (Dakir 2010: 2). The curriculum has a big influence on education because it is used as a guide and benchmark in learning in schools.

According to the Thai National Education Act 2542 (1999) Article 6 in managing education must be able to develop Thais who are physically, spiritually, intellectually, as well as moral, cultural and customary in their daily lives so that they are able to coexist with others. Article 7 in the learning process must be able to plant true awareness about politics and governance in the democratic system of the King as Head of State. Defending human rights, following the constitution, respecting each other proudly as Thai citizens, safeguarding the public and state interests, including developing a culture of local products and universal science and preserving natural resources and the environment into creative, professional careers and curiosity in seeking knowledge.

There are several curriculums that are applied in Thailand, such as the 2001, 2003, 2008, and 2011 curriculums. In its application, Thailand seeks to answer the needs of the community by providing opportunities for schools to choose and apply the curriculum independently, adjusting to the school's own criteria. This freedom is arranged in such a way that the graduation of students is not determined by the national exam, but rather the school exam. Ten national economic and social development plans (2007-2011) emphasize the need to shift the focus of human development. This has become important for Thai people to be equipped with desirable moral values and intelligence. Students must be able to enjoy full physical, intellectual, emotional and spiritual development. Students will be able to adjust to changes that cannot be avoided, and lead to a transformation. These priorities are in line with the Thai Children's Ministry of Education's policy of guiding students towards the 21st century. Emphasis is placed on morality, preference for patriotism, analytical and creative thinking skills in technology, teamwork capacity and ability to live in peace and harmony in the world community (Thai Ministry of Education, 2008).

The study, monitoring and evaluation of the implementation of the 2001 basic education curriculum, together with the principles of the tenth National economic and social development plan for human capacity development, as well as the priorities recommended by the Ministry of education for youth development for the 21st century led to the revision of this curriculum. As a result, the 2008 basic education core curriculum has been formulated for greater clarity and accuracy. Improvements were made to present the objectives and process of implementing the curriculum at the local level and in the education service school. Concise vision, goals, significant capacity and desired characteristics of students, and learning standards and indicators have been delivered, providing guidance for preparation. The foundation of the 2008 core education curriculum is formulated so as to provide the community and school with a framework and orientation for preparing books. Teaching and learning activities organized for all Thai children’s and young people at primary education level aim to improve the quality of students regarding the important knowledge and skills needed for their lives in a changing society. As such they will be empowered to seek further knowledge for continuous lifelong self-development.

The Thai Ministry of Education in The Basic Core Curriculum (2008) explains that the 2008 curriculum upholds the principle of decentralization with a vision to create harmony in development in all aspects of physical aspects, knowledge and morals, which ultimately leads to the development of the country. This vision can be achieved by fulfilling key student
competencies, desired characteristics, and learning standards. The content of the key competencies includes (1) communication capacity to receive and send information; (2) the capacity of thinking to analyze, synthesis, constructive, and critical and systematic thinking; (3) problem-solving capacity; (4) capacity to apply life skills; (5) capacity to apply technology. Furthermore, the desired criteria from students include (1) love for the country, religion, and king; (2) honesty and integrity; (3) self-discipline; (4) a great desire to learn; (5) adherence to the principle of economic sufficiency; (6) dedication and commitment to work; (7) respect for Thailand; (8) public thinking.

The Luangprathanratnikorn Industrial and Community Education College chose to use the 2008 curriculum which was deemed most appropriate to the needs of the school. This is in accordance with the vision of the Luangprathanratnikorn Industrial and Community Education College as a vocational school to create skilled and professional workforce in their respective fields.

The 2008 curriculum is applied in all studies in the Luangprathanratnikorn Industrial and Community Education College, including advanced sewing subjects in home economics. Advanced sewing subjects are theoretical and practical subjects aimed at equipping students with sewing knowledge and skills.

One of the subject matter received in advanced sewing is making a mini dress, where new students are first taught to make a complete fashion, by developing knowledge from previous subjects where students make pieces of clothing separately.

The advanced sewing learning activity itself is a form of school to apply the key curriculum competencies of 2008 points 1, 4 and 5, namely the communication capacity of receiving and sending information, the capacity to apply life skills, and the capacity to apply technology.

Based on the results of recapitulation of data collected, it was concluded that the process of making a mini dress in advanced sewing subjects in the home economics department was simple, flexible, tolerant, referring to existing learning resources. Learning activities are supervised by the teacher, requiring students to always consult with the teacher in every step taken. This is due to the complexity of sewing techniques and the lack of complete learning resources outside of school, emphasizing the role of the teacher as a skilled person as the only concrete source of learning. Students are allowed to look for as many learning resources for later discussion in class, but are not allowed to directly use these learning resources before consulting with the teacher.

Students are not even allowed to bring work home, but are only allowed to do work at school during school hours to reduce the risk of cheating and provide more space for students to explore the world outside of school. This policy is a form of applying the third point in the desired student criteria in the 2008 curriculum, which is honesty and integrity.

The teacher does not give specific criteria to the mini dress that will be made, but instead frees students to be creative, one simple focus is enough. The teacher also does not provide specific criteria for selecting mini dress material, giving more space for students to choose independently, adjusting the characteristics of the mini dress they want to make. Most students prefer to use cotton because it is easy to sew.

Learning activities take place by upholding the use value of the product to be made, then making a mini dress tailored to the needs and desires of each student. Although the subject matter is making a mini dress, the teacher allows Muslim students to make maxi dresses so that the dress can be used by students everyday.

The high tolerance upheld in the advanced sewing class illustrates the second point in the desired student criteria in the 2008 curriculum, which is the love of religion. The teacher implements this to students without being pushy, calm and very understanding. This treatment
also provides standards for student behavior to treat each other according to the teacher's reflection.

Each stage in making a mini dress is done with a simple structure, both in designing, making patterns, cutting, and sewing. Students are not required to design mini dresses using proportions of design, because the teacher is more focused on the description of the mini dress to be realized than the description on paper. Furthermore pattern making is done using the body size of each student with a practical pattern system. The pattern that has been made is then pinned to the material and then cut by giving the seam cut with 1.5 cm from the seam because the technique of finishing the cloth using the open seam is fixed. Before the pieces are sewn together, students are required to bare first in each rader line on the material, then put the pieces together with the material. This is intended to ensure accuracy when stitching each piece, so as to create a neat and accurate product after stitching using a machine.

The making of a mini dress is different for each student, adjusting to each design. One definite path is that each student completes the difficult part on each piece before putting it together with the other pieces. There are students who work their arms first, and there are students who work their bodies first.

Making mini dresses in advanced sewing applies the principle of decentralization which is upheld in the 2008 curriculum by freeing students to make mini dresses according to their individual needs.

Other research on curriculum application that has a connection with this research is a study from the 2015 Komnas Community titled New Trends in Higher Education Towards the 21st Century in Thailand. This research focuses on the circumstances as well as threats to higher education in Thailand. Prathip (2015: 17) concludes that in the next 5 years, what is critical for the higher education system is how to adopt a personal regulation strategy and increase effectiveness and effectiveness in dealing with scarcity of resources. Similar findings were also found in this study, that teachers are the main source of knowledge required to carry heavy responsibilities in daily learning and curriculum application. The high demand for responsibility and the difficulty of finding other sources of knowledge that are as accurate as the teacher creates difficulties for the teacher to meet the competency standards and lead to scarcity.

Another study was conducted by Jason L. C. in 2015 entitled Marketing Curriculum Preparedness for Thailand: Comparing Research for Marketing Curriculums is Colleges and Universities for Higher Education Institutions in Thailand. Jason (2015: 1022) found that Thai education needs to develop productivity in social responsibility, by enabling the marketing curriculum to stay centered on areas that are more effective than what is covered in the marketing mix. This finding is in accordance with the application of the 2008 curriculum which was made with the hope to answer the needs of the community.

Subsequent research was conducted by Sanit Srikoon et al in 2013 entitled Research Synthesis of Research-Based Learning for Education in Thailand. Sanit Srikoon et al. Quote Baldwin (2013: 916) that students in Thailand can develop strong intellectuals and practical connections between research boundaries by mastering learning itself. special education towards inclusive. The law mandates that (1) inclusive education be an option for the education of students with disabilities; (2) individuals with disabilities have the right to be included at every level of the education system from the beginning of the intervention and 12 years of basic education to the level of tertiary education; (3) it is against the law for schools to refuse entry to students with disabilities, and (4) students with disabilities must be provided with an Individual Education Plan (IEP) based on at least an annual update (Rajkijjanubaksa, 2008).

2013 Indonesian curriculum.
The basic 2013’s curriculum is a curriculum that was developed after the 2006 curriculum. 2013 curriculum focuses on improving the quality of education by balancing hard skills and soft skills through the ability of attitude, skills and knowledge in order to face the evolving global challenges. This curriculum is focused on the formation of competencies and characteristics of students, in the form of a blend of knowledge and skills, and attitudes that students can demonstrate as a form of understanding of the concepts they learn contextually. This curriculum began to be implemented in the 2014/2015 school year which emphasizes on eight standards. The eight standards are the Content Standards, Process Standards, Graduation Standards, Education and Education Staff Standards, Facilities and Infrastructure Standards, Financing Standards, Management Standards, and Education Assessment Standards. According to Hidayat (2013: 29) 2013 Curriculum orientation is an increase and balance between attitude competencies (attitude), skills (skills), and knowledge (knowledge). Professional teachers have pedagogical competencies, social competencies, personality competencies and professional competencies.

Teachers before teaching must have the provision of teaching skills such as: opening lessons, conditioning student learning situations, providing reinforcement, communicating with students, giving questions, giving feedback, assessing learning outcomes and closing lessons.

Opening the lesson is done by the teacher greeting, then conditioning students. After that the teacher gives apperception to students.

Conditioning the learning situation so that students are calm and able to concentrate fully, actions taken by the teacher such as the teacher not only stand or sit during the KBM, the teacher pays attention to all students, so that the attention of all students is focused on the learning process. The use of learning methods and media and variations in learning.

Giving reinforcement to students is a motivation so students become more interested in the lesson. The teacher provides reinforcement if the students' answers are correct and to increase students' interest in the lesson. Strengthening is given verbally (verbally), nonverbally (body cues), and a mixture of both. Good communication will make the learning process run smoothly and the learning outcomes will be maximized. The methods and media used in learning must be in accordance with the material, the state of students in class and the condition of students' classrooms.

In delivering the material, the teacher must be able to manage variations in sound, technique or media. The teacher's voice must be loud and vary in tone and intonation, so that students can be heard and noticed. Sound variations are made so that students do not get bored and stay focused in learning.

Questions must be in accordance with the material provided. The questioning is intended so that the teacher knows whether students are able to accept the material being taught. The teacher always gives feedback so that all learning activities that have been carried out are in accordance with the objectives or not. The assessment of student learning outcomes is based on the assignments given and the daily tests. These daily assignments and tests can be given at the end of each chapter or at the end of each sub-topic taught.

Closing the lesson begins with concluding the material then giving home assignments for the material at the next meeting or assignments from what has been taught. Then close with greetings. Opening the lesson is the beginning of the teacher before starting a lesson. These activities can be in the form of reviews such as checking homework or student assignments with
the aim to find out the readiness of students to continue the next lesson. Learning activities begin with opening activities starting with communication with students.

The teacher is effectively able to communicate and explain learning activities in the classroom. Orientation on assignments must be completed at school by being monitored by a team of teachers. Teacher clarity in providing the context of the activity is important not only to make the activity effective, but also can increase understanding of the activity.

The teaching method in the learning process as one of the teacher's creative strategies uses a way of delivering lessons in the hope that subject matter can be accepted by students as well as possible. Some learning methods used by teachers include: lecture, question and answer, tutorial mastery, problem solving, project based and discussion.

The educational method applied is no longer in the form of teaching for the passing of the test (teaching to the test) but a comprehensive education that pays attention to social abilities, character, character, national cultural love, and so on. The media used in teaching is very varied according to the needs of the training course. The media that are always in the classroom are blackboards and textbooks, as well as LCDs, while the media practice subjects are adapted to the equipment needed to achieve the competency standards.

The Variative learning methods and strategies are carried out by the teacher in determining strategies to deliver a material that can be received by students optimally. Basically students will experience boredom if a given material requires heavy thinking, without any variation of the teacher in delivering the material or can be said to be monotonous delivery. These variations can be in the form of humor, intonation processing, pronunciation of words, quizzes, emphasis on material that is considered important so that it is easy to understand and utilizes assistive media as a means of material explanation. The teacher also provides reinforcement after completion of learning so that a shared decision is obtained by an in-flight decision term, the decision made during the activity. Vocational competencies of students include making decorations, designs, patterns, making industrial clothing and making costumed clothing.

Syllabus of the subjects of industrial fashion making has core competency 1 (KI 1) is a graduate of Appreciating and practicing the teachings of the religion he follows, KI 2 Living and practicing honest behavior, discipline, responsibility, caring, mutual cooperation, cooperation, tolerance, peace, courtesy, responsive and proactive and shows attitude as part of the solution to various problems in interacting effectively with the social and natural environment and in placing itself as a reflection of the nation in the world. KI 3 Understanding, applying, analyzing and evaluating factual, conceptual, basic operational and metacognitive knowledge in accordance with the field and scope of work Dressing on a technical, specific, detailed and complex level with respect to knowledge, technology, cultural arts and humanities in the context of development self potential as part of the family, school, community, national, regional and international, KI 4 Carry out specific tasks, using tools, information and work procedures that are commonly done and solve problems in accordance with the field of dressmaking, displaying performance below guidance with mutan and measured quantities according to work competency standards. Demonstrate the skills of reasoning, processing and serving effectively, creatively, productively, critically, independently, collaboratively, communicatively, and solutically in the abstract realm related to the development of what they learn in school, and able to carry out specifics under direct supervision. Demonstrate skills, perceive, readiness, imitate, proficient movements make natural movements in the realm of
concrete related to the development of what they learn in school and are able to carry out specific tasks, under direct supervision.

The core competencies of subjects to make costumed clothing include KI 1. To appreciate and be grateful for the teachings of the religion that it adopts KI 2. To live and practice honest behavior, discipline, responsibility, care (mutual cooperation, cooperation, tolerance, peace), responsiveness and proactivity and being proactive, show attitude as part of the solution to various national problems in interacting effectively with the social and natural environment and in placing oneself as a reflection of the nation in the world community of IP 3. Understanding, applying, analyzing and evaluating factual, conceptual, and procedural knowledge and cognitive eyes in science, technology, art, culture, and humanities in humanity, nationality, state and civilization insights related to the causes of phenomena and events in specific fields of work to solve KI problems 4 Cultivate, serve, reason, and create in the realm of concrete and abstract domains related to the development of what he learned in the school independently, and is able to carry out specific tasks under direct supervision.

Some basic competencies related to sewing advanced clothing from KI 3 are 3.1 Analyzing party dresses 3.2 Formulating techniques to cut out party dress materials 3.8 Formulating the skirt cutting technique. Demonstrating how to iron the skirt. 3.10 Formulating the skirt sewing technique. 3. Demonstrating how to calculate the selling price of the skirt. The basic competency of KI 4 includes 4.1 Identifying party dresses (understanding, types, finishing / manufacturing techniques, characteristics / characteristics of material types) 4.2 Cutting the material of the party dress 4.3 Ironing the party dress 4.4 Sewing the party dress 4.5 Calculating the calculation of the sale price of the party dress 4.6 Packing the dress party.

The learning activities of tailoring fashion are theoretical and practical, emphasizing the objectives to be achieved, and the competencies that must be met and applying technology to be one of the educational goals. Students design products according to their creativity and practice in school. Learning in the Fashion Management expertise program at Vocational School Semarang is based on the implementation of the 2013 KTSP curriculum which must master compulsory and vocational group subjects (basic fields, basic competencies and vocational competencies). The teacher implements according to standard processes including, planning the implementation of learning, implementing the learning process, and evaluating learning outcomes. Learning activities are emphasized to be able to think critically or have HOTS (High Order Thinking Skill) and use scientific learning. Learning activities also include practical activities and theory using project-based learning methods supported by teaching factory. Assessment is carried out by the school, academics, industry and also through national examinations.

The learning process of sewing practices is done in several stages.

1. Design Determination
   The design determination is carried out by a team of teachers who teach sewing practices or who teach sewing practice subjects at SMK N 6 Semarang by taking several samples made from both the teacher and some students. Samples taken about 1-2 designs that will be realized in class.

2. Make a Pattern
3. Determination of ingredients
Material was determined by a team of sewing practice teachers who consulted with the department's financial department. Determination of the material has previously been done material estimates by making material design and price design.

4. Cutting material
The cutting of material is done en masse which is guided by the teacher by using an industrial cutting tool, after that it is budded, then marked by the students. Usually the marking step is done at home as homework.

5. Sewing Process
Sewing is done individually by using industrial sewing machines for classes XI and XII and manual machines for class X. The sewing process is guided by the teacher who explains first at the beginning of learning, things to consider before sewing, such as sewing steps, reminds to use work clothes, provide trash bins. After students start sewing, the teacher examines one by one the student's sewing process and evaluates at the end of sewing learning. The sewing process is carried out entirely in school, it is due to the method used by the teacher, which is using the teaching demonstration method and also lectures.

6. Rating
The assessment is done before, during the process and after becoming a product. The final assessment was also carried out by involving outside parties, namely academics and industry/practitioners as a test of student competence.

Research on the curriculum was also conducted by Heri Retnawati et al in 2013. The study was titled Vocational High School Teachers' Difficulties in Implementation Assessment in Curriculum 2013 in Yogyakarta Province of Indonesia, which aims to describe the difficulties of vocational teachers in implementing the assessment system in the 2013 curriculum. The results of this study, Retni, et al (2016: 45) conclude that the key to teacher difficulties is the lack of comprehensive understanding of teachers about the 2013 curriculum, including the implementation of assessments, such as planning, implementing and reporting student achievement. Implementation of Curriculum 13 in SMK Indonesia Revised 2013 Curriculum Implementation 1) More students are required to be more active, creative and innovative, 2) assessment standards lead to competency-based assessments such as attitudes, skills and knowledge proportionally, 3) Teachers play the role of facilitators, 4) Student-centered learning becomes more active learning.

4 Conclusion

The application of learning to sew clothing all goes well and in accordance with aspects that have been arranged in the curriculum in preparing graduates to enter the workforce in accordance with their respective fields. Learning to make clothes at vocational schools in Thailand is based on the implementation of the 2008 curriculum while Indonesian and vocational schools implement the 2013 curriculum. Learning fashion that takes place has almost the same process starting from design, pattern, cutting, and sewing. The design process is more emphasized creativity, but for sewing techniques get more attention to be completed with the
techniques conveyed by the teacher so that the work is done at school and should not be taken home. costumed fashion manufacture. Vocational competencies of students include making decoration, design, pattern, make clothes and make clothes customized.
References


Relevance of Vocational High School Curriculum with Civil Engineering Vocational Education

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Abstract. Educational components that play an important role in improving the quality of education are the curriculum. The curriculum serves as a tool and guidance on the progress of the learning process. Relevance of the curriculum is a major factor between education taught in college with the competencies expected in the workforce, in this case especially on the relevance of the curriculum between building engineering education and the curriculum Lessons taught at Vocational High School. This research aims to determine the level of relevance of vocational high school curriculum with civil engineering vocational education. The method of collecting data in this study is a questionnaire and documentation. The data analysis technique used is descriptive quantitative. Results of research percentage level relevance of vocational high school curriculum with civil engineering vocational education with the number of respondents 20 teachers from some vocational education in the Central Java region is 82.86%.

Keywords: Relevance Curriculum, Vocational Education

1 Introduction

The curriculum is a series of planned program activities to achieve the expected competencies. “Curriculum planning is a process in which participants at many levels make decisions about what the purposes of learning ought to be, how those purposes might be carried out through teaching-learning situations, and whether the purposes and means are both appropriate and affective” (Beane, 1986), in planning curriculum for tertiary education and vocational high schools (SMK) must pay attention to several aspects, one of which is the aspect of competence expected in the world of work or competencies required by stakeholders. Curriculum planning in general must consider the needs of the community, the characteristics of learners, and the scope of knowledge in the hierarchy of knowledge (Taba dalam Saylor, et al., 1981). The curriculum in the study of building engineering education aims to be able to print the competencies of graduates as Vocational High School teachers in building engineering in a professional manner. Therefore this study discusses the relevance of the Building Engineering Education study curriculum with the Building Engineering SMK curriculum.
2 Method

The type of research used is descriptive quantitative. Research on Professional Competence of Productive Teachers on Building Engineering Study Program graduates at PTB UNNES to find out how much the level of professional competence of technical teachers graduated from the UNNES PTB study program.

The method used is the method used is a questionnaire / questionnaire and documentation. The research was conducted at several vocational schools in Central Java including the SMK N 1 Kedungwuni, SMK N 1 Adiwerna Tegal, SMK N 1 Blora, SMK 2 Cilacap, SMK N 2 Kebumen, SMK N 2 Sragen, SMK Ganeshatama Boyolali, SMK Sunan Kalijaga, SMK N 1 Blora. Thenonprobability. The sampling technique in this study was carried out by nonprobability sampling technique, there is a saturated sampling technique, which is a sampling technique if all members of the population are sampled (Sugiyono, 2010: 124). This sampling technique is used when facing a relatively small population. The number of respondents in this study were 20 people who were alumni of the PTB UNNES study program from 2008 to 2011 with a total of 14 questionnaire questions, with the following assessment criteria:

Table 1. The descriptive criteria of the curriculum relevance percentage

<table>
<thead>
<tr>
<th>No</th>
<th>Interval</th>
<th>Relevance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84 % - 100%</td>
<td>Very relevant</td>
</tr>
<tr>
<td>2</td>
<td>67 % - 68 %</td>
<td>Relevant</td>
</tr>
<tr>
<td>3</td>
<td>52 % - 52 %</td>
<td>Slightly relevant</td>
</tr>
<tr>
<td>4</td>
<td>36 % - 51%</td>
<td>Irrelevant</td>
</tr>
<tr>
<td>5</td>
<td>20 % - 35%</td>
<td>Very irrelevant</td>
</tr>
</tbody>
</table>

3 Results and Discussion

The results of the analysis showed one competence / curriculum at vocational schools that was not relevant with the 2008 curriculum of the Civil Engineering Vocational Education Department, UNNES. The 2008 curriculum of the Civil Engineering Vocational Education Department, UNNES has 43 subjects with these following categories: Personality Development Subjects (MPK), Scientific and Skills Subjects (MKK), Productive Skills Subjects (MKB), Productive Behavior Subjects (MPB), Community Behavior Subject (MBB). The existing curriculum of Civil Engineering Vocational Education Department was the 2013 curriculum. It has the different names for each skill program and skills competencies. However, the content of the coverage is similar to that of the previous curriculum.
Table 2. The results of curriculum relevance

<table>
<thead>
<tr>
<th>No</th>
<th>Relevance Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very relevant</td>
<td>82.86%</td>
</tr>
<tr>
<td>2</td>
<td>Relevant</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Slightly relevant</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Irrelevant</td>
<td>17.14%</td>
</tr>
<tr>
<td>5</td>
<td>Very irrelevant</td>
<td>0</td>
</tr>
</tbody>
</table>

The data were obtained from 20 respondents who have become teachers in Civil Engineering Vocational Education Department. The data showed the percentage of relevance between 2008 curriculum of Civil Engineering Vocational Education Department, UNNES with the curriculum of the vocational schools is 82.86%. It is categorized as very relevant. 17.14% do not respond to the item. The relevance results of the Curriculum Relevance of Vocational High School Curriculum with Civil Engineering Vocational Education with a percentage of 82.86 is relevant.

References

Management Of Work Conflict, Work Stress In The Organization And How To Overcome Them

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Abstract. Work conflict and work stress are unavoidable work problems. Both of these things often happen in an organization. Work conflicts can arise from yourself and the workplace environment. Meanwhile, from the work environment, for example, there is competition among coworkers, unable to meet the targets set by the company or organization. Broadly speaking, work conflicts are divided into two types, namely: Substantive conflicts, namely disputes related to group goals, allocation of resources within an organization and division of job positions and emotional conflicts that occur due to feelings of anger, distrust, unsympathetic feelings, fear and rejection, and the presence of interpersonal clashes (personality clashes). The consequences of work conflicts can be positive, it can be negative. As a result of increased work productivity because each individual tries to give his best, while the negative result of work conflict is that work stress will arise because each individual feels uncomfortable and each individual looks for the truth on his own.

Keywords: Management, work conflict, job stress.

1 Introduction

Many people hold the opinion that conflict is something negative and should be avoided, even though sometimes conflict is something that can make things better. Conflict can increase work motivation, improve product quality (because each will try to achieve the best), make competition healthy and so on. Besides having positive consequences, the negative consequences of conflict are job stress. There are organizations or companies that apply this conflict to achieve organizational or company goals, because they see conflict as very effective in improving performance. Several kinds of work conflicts, including conflicts that arise between individuals and groups or organizations and conflicts that occur within individuals themselves. What often happens is conflict between individuals and groups, because it involves a lot of other parties or work. This type of conflict will be very useful when the organization can manage it so that it can increase worker productivity. Emotional Conflict is more individual because it involves the feelings of each individual in doing his job and each individual will be different from one another.

Work conflict and work stress are two interrelated variables, because work conflict will cause someone to experience work stress if they cannot manage conflicts that occur in their work environment. Job stress can occur anywhere, not only in large companies. Usually work stress occurs because someone is being chased to achieve certain targets.
2 Work conflict

The main text should be written using Times New Roman, 10pt, fully justified. Italics can be used for emphasis and bold typeset should be avoided.

2.1 Definition of Work Conflict

Conflict is a conflict that occurs between what a person expects of himself, other people, the organization and what he expects. Every human being will always have a perception of inequality or different points of view on something, so that these differences can lead to conflict [1]. Furthermore, according to [2] provides a definition of conflict as a struggle between needs, desires, ideas, interests or conflicting parties, as a result of differences in goals (goals); value (values); mind (cognition); feeling (affect); and behavior (behavior).

In a large organization, of course there will be conflicts, this cannot be avoided. Conflict can make an organization stable and develop, but it can also put an organization or company out of business. This conflict will continue as long as each party is still searching for the truth of each, so that mutually beneficial resolution of both parties is needed. Stress is one of the main areas of concern today in any organization and can be considered as a result of the pressure of various problems faced by humans in the organization. So that stress is manifested when people are faced with so much stress that their normal behavior patterns are affected. In other words, stress generally occurs because of a tense condition that affects one's emotions, thoughts and physical conditions [3].

[4] states that work stress is a condition of tension that creates a physical and psychological imbalance that affects emotions, thought processes, and the condition of a worker towards their environment. The occurrence of work stress can be understood as a situation where a person faces a task or job that cannot or cannot be reached by his / her abilities, for example if someone's ability only reaches 5 (five) but faces a job that demands ability with the number 9 (nine), then it is very possible once a person will be exposed to work stress [5]. [6] states that work stress is a condition of tension that affects a person's thought processes, emotions, and psychological conditions, the result is that too much stress can threaten a person's ability to face the environment and will ultimately interfere with the implementation of his duties.

[7] outlines that work conflicts that occur are divided into two types, namely: Substantive conflicts (conflict between individuals and groups). This type of conflict often occurs because it relates to individuals and groups or companies. Each of them has a stand that is considered correct. An example for this case is the conflict between the finance department and the sales department. The sales department tries to meet the target by trying to sell as many products as possible, so the production must be large. On the other hand, the finance department is making cost savings, thereby reducing the cost of certain raw materials that are deemed less important. This conflict can be resolved if each of them sits together to find a solution.

Emotional conflicts (conflict because in the individual itself). Occurs as a result of feelings of anger, distrust of other people / the environment, unsympathetic to someone, fear of unclear reasons and rejection of the environment because it is not in accordance with expectations, as well as interpersonal conflicts. This personal conflict is more individual in nature. An example for this case is the individual feeling displeased with the leader because according to the individual the leader does not always listen to his aspirations or input, there can also be discomfort that has been brought from home (usually occurs in women).
Furthermore, [7] further explains in organizational life, opinions about conflict can be seen from three perspectives, including:

Traditional view. In this view, conflict is something that is unwanted and dangerous for organizational life. For example, if there is a conflict between the leader and the worker, the leader tries to get rid of the worker because he thinks this worker will hinder or make him uncomfortable.

View of behavior. This view argues that conflict is an event or event that usually occurs in organizational life that can be beneficial (functional conflict) and can also be detrimental to the organization (dysfunctional conflict). This view emphasizes that conflict can have both positive and negative consequences. Examples for functional conflicts include conflicts that occur in each part of an organization, for example conflicts between production and financial View interactions. According to this view, conflict is an event that cannot be avoided and is indispensable for organizational leaders, conflict can increase morale because each will compete to achieve goals. Examples of conflicts that occur between trade unions and employers. The union wants to increase the UMR, while the employer will increase the UMR after workers show their work results or improve the quality of their work. Each has a goal, the entrepreneur has the goal of improving the quality of the product, while the labor union has the goal of increasing the UMR.

Based on the three views above, the leadership of the organization needs to analyze the real conflicts that occur in the organization and how conflict management has a positive effect on organizational progress. Conflict is inevitable, every organization must have experienced conflicts, it remains how to manage the conflict itself so that it becomes positive both for the organization and for the workers.

2.2 Types of Work Conflict

According to [7] there are five known types of conflict, namely: Conflict Within A Person (Intrapersonal)
A person can experience internal conflicts in himself because he feels uncertain about which one he should choose, do or because the demands of too many tasks. Intrapersonal conflict is a person's conflict with himself. Conflict occurs when a person has two desires that cannot be fulfilled at once. As it is known that in a person there are usually the following things: A number of competing needs and roles. A variety of different ways in which these roles and needs are generated. There are many forms of obstacles that can occur between motivation and purpose. There are both positive and negative aspects that hinder the desired goals. An example of an intrapersonal conflict, for example, a lecturer who happens to be concurrently a teacher must choose one, to become a lecturer or a teacher even though he / she already has the teacher's functional allowance.

The things above in a person's adaptation process to their environment often lead to conflict. There are three types of intrapersonal conflict, namely:
Conflicting approaches. For example a person who is faced with two equally attractive choices, for example a person is offered two jobs that he both likes.
Conflict-avoidance approaches. For example, a person who is faced with the same two choices makes it difficult, for example someone has to make a choice of two jobs that have the
same risk. Avoidance-avoidance conflict. For example, people who are faced with one thing that has both positive and negative values, for example, a worker who works for a company that has strict regulations (it is very difficult to ask for permission to not come to work) but gets large compensation.

Interpersonal Conflict
Interpersonal conflict is a conflict between a person and another because of a conflict of interest or desire. This often occurs between two people with different status, position, field of work. Each individual competition occurs because they have different interests.

Conflict between individuals and groups
This conflict involves individuals with groups. If there is an individual who cannot fulfill the group's wishes, he will be punished.

Conflict between groups within the same organization
This conflict is a type of conflict that often occurs in organizations. Conflict between lines and staff, workers and management workers are two areas of conflict between groups.

Conflict between organizations
An example is in the economic sector where Indonesia and China compete in batik products. This is a form of conflict. Based on experience, this conflict has resulted in the development of new products, new technology and new services, lower prices and more efficient use of resources, as each country tries to produce products with low prices and quality.

In order for stress to be managed and minimized, individual workers and management should know the factors that cause work stress in the organization.

According to [8], in the context of daily work, workers who experience stress are caused by factors, including: (1) Types of work such as monotonous tasks, less challenges, lack of variety, unpleasant tasks. (2) Workload and work speed such as too little time to do, work under time pressure, tight and inflexible work schedules, unpredictable working hours, poorly designed shift schedules. (3) Participation and control such as lack of participation in decision making, lack of control (e.g., over work methods, working at high speed). (4) Career development, status and compensation such as job security, lack of promotion prospects, weak payment schemes, minimum payment amounts, unclear performance evaluation systems, interpersonal relationships. (5) Work relations such as bad relationships with co-workers, bullying, harassment and violence, there is no work procedure. (6) Organizational culture such as poor communication, bad leadership system, lack of clarity about organizational goals. (7) Personal problems such as conflicts over work and home demands, lack of support at work, lack of support for work at home problems.

The results of the study explain that all the causes of stress are negatively related to job performance and organizational performance [9]. This means that the higher the level of stress experienced by workers, the lower their performance will eventually affect the performance of their organization as a whole. In a study conducted by [10] at Islamic banks in Indonesia, it was found that job stress is a factor that has a significant effect on the performance produced by workers.
2.3 Factors - Factors Causing Occupational Conflict

The factors that influence conflict can be grouped into two major groups, namely internal factors and external factors. [7] In terms of internal factors, several things can be mentioned:

Organizational stability. Organizations that are already established are usually able to resolve any conflicts because they respect the differences that occur. These organizations are used to dealing with conflicts so they know and resolve them quickly.

Value system. The value system of an organization is a set of boundaries that include the basis for the purpose and way of interacting with an organization, whether something is good, bad, wrong or right. The value system formed by the organization can be in the form of the rules applied in the organization, the organizational culture that has been running for years, and the habits that have occurred during the organization's existence. If this value system is good then it should be continued, but there are times when the value system is not quite right but it is considered correct. This needs to be addressed.

Purpose. The goals of an organization can form the basis of the behavior of the organization and its members. From one organization to another, of course the objectives are different, there are non-profit organizations (foundations, orphanages) and profit organizations (companies).

2.4 Forms of Conflict and Work Stress in Organizations

It was further explained by [7] that there are three forms of conflict in organizations, including:

Hierarchical Conflict (Hierarchical Conflict), Namely conflicts that occur at the level of the organizational hierarchy, for example conflicts between leaders and department heads. Hierarchical conflicts occur because of differences in the interests of each individual, differences in perceptions and possibly different goals.

Functional Conflict (Functional Conflict), Namely conflicts that occur from various departmental functions in the organization. For example, a conflict between the production department and the financial department. This conflict occurs because of differences in the goals of each part of the organization.

Formal - Informal Conflict (Formal-Informal Conflict), Conflicts that occur, for example, norms in formal organizations are carried out in non-formal organizations

The research problems of this study can be formulated as follows: why can work conflicts and work stress occur in an organization or company? Is there any effect of the conflict on performance or productivity? Can conflict and work stress be avoided?

3 Discussion

Conflicts can happen to anyone, both individuals and groups, this needs to be realized that each individual is different and each has different interests and goals. Based on the theoretical basis that has been stated above, it can be concluded that the causes of the conflict are:

The uniqueness of the individual, each of which has differences that are not owned by other individuals.

The nature of individual egoism. This attitude is reflected when the individual does not appreciate input from other parties. For him his opinion was the most correct and considered the opinions of others to be wrong. Differences in goals, especially between personal goals and organizational goals.
The situation that has been brought from the previous place. If the individual has experienced problems from home, it will directly affect him when he goes to the office / workplace. The economic condition of the family which is completely deprived. This will have an impact on work because the individual will definitely be affected, especially if the compensation is not sufficient to meet the needs of the family.

Conflict prevention and management measures in organizations that can be implemented by management, namely:

(1) Management implements predetermined policies without tolerance for actions that violate these rules.
(2) Ensure that the established policies do not contain discrimination.
(3) Ensure that managers set a professional example in preventing and managing conflicts.
(4) Educating all members of the organization in communicating especially on any problems that occur and implementing strategies to reduce stress among staff.
(5) Assisting workers with problems as soon as possible, especially during busy times and ensuring a comfortable and safe physical work environment. Furthermore, [11] explains that the initial management can take steps to help them through facilitating, reconciling, mediating and negotiating those who are in dispute.

How to manage and manage work stress strategies according to [12], making organizational strategies will be able to help in overcoming stress in the workplace. Organizational strategies that can be implemented can include:

Determination of health and welfare procedures for workers. This includes various forms of health surveillance, health promotion activities, counseling on health-related issues and provision of adequate welfare facilities etc. These standards encourage managers, workers, workers and their representatives to work together to identify potential causes of stress in the workplace and then take action to improve the situation.

Management style. Here regarding environmental care is very important, the application of a good communication system and openness to all problems faced by workers. Change management. Management must recognize that impending change of any kind, is one of the most significant causes of stress in the workplace. This is generally related to job insecurity, insecurity, threats of termination of employment, loss of promotion prospects and so on. To eliminate the potentially stressful effects of change, a high level of communication as to what happened must be maintained and any such change must be properly managed step by step. Training activities. Worker training activities must consider the potential stress in certain work activities. People must be trained to recognize the elements of stress in their work and the strategies available to deal with this stress. In addition, job design and work organization must be based on the principles of their competence and expertise.

Strategies to deal with stress can also be done from the individual's side, for example by keeping away from stressors, processing thoughts by changing perceptions of stress, eliminating stressors, controlling increased stress and asking for social support from people around them. In addition, it can also be done through self-discipline by making regular work plans, work targets or work programs that can be reached.

[13] states that stress in an organization does not always endanger organizational life, as long as the stress that appears will only be at a low or moderate level. There are several ways that
can be done to manage conflict and work stress. Troubleshooting. In the face of conflict trying to resolve it. This method can be done with the help of friends or closest people. The sooner the conflict is resolved the better. How to deal with conflicts and deal with problems include immediately dealing with people who have problems with you, because letting problems drag on is not good and it is getting harder to solve them. Furthermore, speak well and be calm, remain neutral, respect opinions, invite peace and ask for help if needed.

Avoiding conflict. Usually it happens to people who really don't like noise or conflict. Every time there is a difference the individual will try to avoid in any way, even he is willing to give in to avoid conflict. Compromise. Compromise is a good solution in resolving conflicts, because each individual can accept the decisions that have been agreed upon. Not all conflicts can be resolved by compromise. Order from authority. This method may not be suitable for some people, because this method of settlement is based on orders from the leadership, which inevitably must be completed. Maybe this method can be said to be forced to be completed. Change structural variables. Because this type of conflict involves individuals who are involved in a leadership, conflict can be resolved by changing the organizational structure. This type of change often occurs in a company or organization.

The effect of conflict on performance or productivity. The existence of conflict will certainly have an impact on individuals, the positive influence will certainly have an impact on increasing productivity or performance. Examples of conflicts that have a positive effect are: if in each part there is competition to show its quality, it can be declared that there is a conflict. Each division responded positively to this competition by competing to produce quality products. Thus, conflict affects the performance or productivity of workers.

There is a theory that someone who is under pressure will produce optimal performance, so it can be concluded that when a person experiences stress, he can produce optimal work. Conflict is unavoidable. Conflict can animate an organization and can bring about change in the organization. Changes that can result from a conflict are:
(1) The company can produce products at low prices and quality. If this happens continuously, then the Indonesian State will be able to compete in the era of globalization.
(2) Each individual learns to appreciate differences and not selfishness, practice resolving conflicts wisely, patiently and not emotionally.
(3) Trying to solve every problem by means of compromise, discussion and together, so that the decisions taken are mutually agreed.

Besides having a positive impact, it is also necessary to know the negative impacts caused by conflicts that occur including the emergence of work stress which can be in the form of disharmonious relationships, decreased productivity, job insecurity, waste of working time and resources, decreased morale, loss of commitment to work, increased resignation, moral injury, unwarranted absence, and legal effects [14]. So it can be summarized that the role of conflict to be positive or negative depends on how we manage and negotiate the challenges and obstacles faced, influence, strengthen, or make peace with the conflicts faced.

Conclusion
The more a company develops, the higher the performance demands or the performance target standards set by the company, this will lead employees to strive to achieve the performance targets set by the company. Workers will maximize their work, adapt to environmental
changes that occur, so that this condition will be vulnerable to work conflicts and work pressures that can cause stress to their workers. Stress and conflict cannot be separated, because severe and prolonged conflict will trigger conflict within individuals and between individuals in the organization. Conflicts and stress that are not handled properly will have an impact on employee performance which will later affect the overall performance of the organization.

Research conducted by [14] on the hotel industry in China has proven that conflict in organizations and job stress affect employee performance. It was found that conflict and work stress have a negative effect on worker performance, meaning that the higher the workers experience work conflict and the higher the stress they feel, their performance will decrease significantly, and vice versa. Where the conflict and stress felt by workers also affect their productivity and comfort at work. In this study it is suggested to managers that workplace conflicts cannot be avoided, especially when conflicts involving task completion or conflicts over interactions with work teams. Managers or leaders should assist their team in diagnosing the types of conflicts that arise and teach team members how to manage those conflicts.

Knowing the causes or sources of stress and work conflict triggers needs to be studied by company leaders so that they can develop strategies in anticipating and managing these two problems in their organization. Professional organizations will certainly find a way for the problems that occur so that their workers can work optimally and be productive in achieving the stated organizational goals.

Suggestion

It is necessary to carry out activities or programs that are familial in nature to strengthen the relationship between fellow workers
Management of tasks and roles as well as a clear organizational structure so that there is clarity of work for each worker, and there is no overload or excessive pressure.
Creating a strategy that involves workers can cause workers to get jobs that are in accordance with their abilities and they work for the goals they want as well as good interpersonal relationships

References

Integration Model of Conservation Values in The Subject of Study in The UNNES Faculty of Engineering to Support The Vision of Conservation Knowledge And International Reputation

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Abstract. The purpose of this research is to explore the conservation values that are most suitable for lectures in fields of study that support the university's vision. This research uses a quantitative approach, which measures the Integration of Conservation Values Model into the Field of Study at the Faculty of Engineering, UNNES. Conclusion; 1). Conservation values contained in concrete character conservation activities, the internalization process of conservation learning, lecture integration, and long-term vision can be applied in lectures in fields of study that support the university's vision. 2). Conservation values that are most suitable for lectures in the field of study that support the university's vision are the application of a long-term vision.

Keywords: Conservation values, integration, the vision of UNNES

1 Introduction

The constitution states that one of the Indonesian state government's objectives, which was carried out by the struggle for the Indonesian independence movement, is to promote the general welfare and educate the nation's life. Educational orientation is the development of quality education with one of the Sustainable Development Goals (SDGs) to encourage the welfare of all groups (Kemenristek Dikti, 2019).

One of the steps taken includes building quality human resources for young and adult people to have relevant knowledge and skills, including technical and vocational skills, to realize competitive, innovative, and human character resources. This theme is relevant in dealing with world conditions becoming increasingly sophisticated at an increasingly rapid pace of change. The software revolution has transformed economic activity, with some jobs requiring the education system to evolve accordingly.

Higher education is required to produce graduates who have adaptable, critical, creative, and innovative abilities. Starting from the above opinion, the General Course (MKU) of Conservation Education, which is implemented at UNNES, is a teaching material that supports the achievement of the university's vision, namely the University with Conservation Knowledge and International Standard. Philosophically, the study of conservation education means that the UNNES academic community is a living creature who is obliged to be responsible for
preserving and developing culture, superior civilization, environmental preservation towards balance and order (Amin Retnoningsih, 2017: 34)

The integration of conservation values into subjects in the field of study within the Faculty of Engineering UNNES is an urgent and relevant need when the university has the desire to establish and establish itself as a university with conservation insight and international reputation. Therefore, it is natural and logical that the various subjects taught need to relate these values in an intense, in-depth, and comprehensive manner. Because of that, a suitable, precise, and effective integration model needs to be explored carefully.

1.1 Research Purposes

The purpose of this research is to explore conservation values that are most suitable for lectures that support the university’s vision.

1.2 Theoretical Review

Several studies that discuss the development of a learning model concerning non-cognitive aspects, especially in soft skills and character, are often found in research on the psychology of the child, adolescent, and adult development. Research conducted by Sudana (2017) suggests that the soft skill aspect of the top category will color individual success in the world of work. Soft skills are a marker of the fundamental character of a person having positive behavior.

Research conducted by Supraptono (2018), which involved Bidikmisi students at UNNES, showed that soft skills training was proven to create positive attitudes towards students' productivity values in carrying out their academic life. They become aware of the meaning of a sense of responsibility as an educated group who must be role models for the environment, ready to carry out meaningful developmental tasks for life. In line with the research above, students' character building will be more effective if carried out through the internalization of fundamental values that, by design, are carried out carefully in every meaningful teaching material. Wangid (2015) emphasizes that it is possible to internalize the values of goodness for students more effectively by developing thematic specific subjects. The case discussion that affects an object shows that students are much more sensitive in developing themselves into individuals who are aware of social and environmental responsibility.

The research discussed above has a strong enough relationship and becomes the basis for the research. From this research, sufficient meaning can be drawn to formulate strategies, the latest methods that can be applied in the FT UNNES environment. This method aims to develop conservation values that are integrated into the lecture process of subject areas of study so that the output can be used as a benchmark for the success of the university's vision, namely the development of character strengths for the growth of science, art, culture and the development of the environment in harmony with national development and the international community.

1.3 Priority of Research

1) It has strategic value for universities that declare themselves universities that carry the vision of conservation and internationalization. 2) Research is in line with the efforts of higher education institutions to instill the values of innovation, creativity, honesty, environmental awareness as proclaimed by the Ministry of Research, Technology, and Higher Education in its long-term programs. 3) This research will contribute to the concepts of educational, scientific
theories, particularly in terms of methodologies and learning strategies that integrate the dimensions of conservation values into the scientific disciplines of the field of study.

2 Methodology

2.1 Research Critical Approach

Starting from the primary research issue that prioritizes a model of integration of conservation values in subject areas of study, a closer perspective is the concept or perspective of models, learning strategies in universities with an orientation of learning outcomes. Thus, this study's critical approach is to use a phenomenological epistemological approach, which means that variables, methods, and interpreting research data will be studied based on the urgency and demands that develop in the research setting environment.

This research is a research with a quantitative approach, which measures the Integration of Conservation Values Model into the Field of Study at the Faculty of Engineering, Semarang State University.

2.2 Data Source

According to (Sukestiyarno, 2010) the source of the data generated is a source of data in the form of numbers or numbers where the data is the result of observations (questionnaires), numeration (calculations), and or measurements of a variable.

2.3 Research Subject

The subjects of this study were several students who had taken the general course (MKU) on Conservation Education. The population in this study is within the Faculty of Engineering, State University of Semarang. The determination of the sample size of the respondents refers to Jackob Nielsen (2012), who says that the user test for quantitative research is at least 20 respondents. In this study, the number of samples determined was as many as 60 students of the Faculty of Engineering, Semarang State University from various fields of study who had taken the Conservation Education MKU course.

2.4 Data Collection Instruments and Techniques

The instrument used in this study was a questionnaire sheet that was used to determine the reliability of the model. In contrast, the data collection technique in this study the writer used the distribution of instruments in the form of a questionnaire filled out by Faculty of Engineering, State University of Semarang students who had attended conservation courses.

2.5 Test Data Validity or Test Validity and Reliability

According to (Sugiyono, 2012), there are two kinds of validity: internal validity, and external validity. Internal validity relates to the degree of accuracy of the research design with the results to be achieved. Meanwhile, external validity relates to the degree of accuracy of
whether the research results can be generalized or applied to the population where the sample is taken.

Validity and reliability testing, according to (Sugiyono, 2012) includes credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity). In this study, the author used triangulation credibility testing, namely checking data from various sources in various ways and at various times.

2.6 Data Analysis Technique

Following the type of data obtained and the problems and expected research objectives, the data collected was then analyzed. To analyze the data obtained using descriptive analysis techniques with percentage presentation. The category level of application of conservation values can be seen in Table 1.

Table 1. Level Category of Conservation Values Application

<table>
<thead>
<tr>
<th>Values Application</th>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lowest</td>
<td>0% — 20%</td>
</tr>
<tr>
<td>2</td>
<td>Low</td>
<td>21% — 40%</td>
</tr>
<tr>
<td>3</td>
<td>Moderate</td>
<td>41% — 60%</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>61% — 80%</td>
</tr>
<tr>
<td>5</td>
<td>Highest</td>
<td>81% — 100%</td>
</tr>
</tbody>
</table>

2.7 Result

Based on the data obtained, then the analysis is carried out, which is described as follows:

The frequency distribution and frequency percentages are obtained from the results of students’ application responses to real activities of conservation character as in Table 2 below.

Table 2. Frequency Distribution of Student Application Levels on Conservation Character Activities

<table>
<thead>
<tr>
<th>Instrument Items</th>
<th>The lowest</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Highest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>1. I am determined to be a person who benefits society</td>
<td>0 0 0 0 0 0</td>
<td>0 0</td>
<td>13,3 52 86,7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Carrying out worship is the main thing</td>
<td>0 0 0 0 0 0</td>
<td>0 0</td>
<td>23,3 46 76,7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I put the best possible process in order to achieve the best results</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cheating is not considered a responsible person</td>
<td>0 0 0 0 6 10</td>
<td>26</td>
<td>43,3 28 46,7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I dare to pay dearly for the status of goodness</td>
<td>1 1,67 10 16,7 18</td>
<td>30</td>
<td>19 31,7 12 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Helping and being ready to sacrifice for others has become my behavior</td>
<td>0 0 0 0 0 0 13</td>
<td>21,7 47 78,3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The frequency distribution of student application level to real activities of conservation character shows that the level of application is dominated by the "Highest" category as much as 62% and the "High" category by 28%. The percentage of the highest application level in the "Highest" category is found in instrument items 1, 2, 3, 4, and 6. At the same time, the percentage of the highest application level in the "High" category is found in instrument item number 5. This data indicates that conservation values, which are contained in real activities of conservation character, are appropriate and can be applied in lectures in fields of study that support the university's vision.

From the results of student application responses to the internalization process of conservation learning, the frequency distribution and frequency percentages are obtained in Table 3 below.

<table>
<thead>
<tr>
<th>Instrument Items</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conservation principles guide my interactions on campus</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>27</td>
<td>45</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>2. A culture of excellence is built with personal awareness</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>22</td>
<td>36,7</td>
<td>35</td>
<td>58,3</td>
</tr>
<tr>
<td>3. Students need to have ethical integrity in achieving their goals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1,67</td>
<td>14</td>
<td>23,3</td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td>4. Students need to have ethical integrity in achieving their goals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>20</td>
<td>33,3</td>
<td>37</td>
<td>61,7</td>
</tr>
<tr>
<td>5. Maintaining and caring for social cohesiveness is an equally important and fundamental task</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3,33</td>
<td>11</td>
<td>18,3</td>
<td>32</td>
<td>53,3</td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

The frequency distribution of student application level to the internalization process of conservation learning shows that the level of application is dominated by the "Highest" category by 54% and the "High" category by 38%. The percentage of the highest application level in the "Highest" category is found in instrument items 1, 2, 3, and 4. In contrast, the percentage of the highest application level in the "High" category is found in instrument number 5. This data indicates that the conservation values contained in the process of internalizing conservation learning, appropriate and applicable in subject areas of study that support the vision of the university.

From the results of student application responses to lecture integration, the frequency distribution and frequency percentage are obtained as in Table 4 below.
The frequency distribution of student application levels towards lecture integration shows that the level of application is dominated by the "Highest" category as much as 55% and the "High" category by 40%. The percentage of the highest application level in the "Most High" category appears on all instrument items. This data shows that the conservation values contained in the integrity of the lecture are appropriate and can be applied in lectures in fields of study that support the vision of the university.

From the results of students' application responses to long-term vision, the frequency distribution and frequency percentage are obtained as in Table 5 below.

The frequency distribution of student application levels towards long-term vision shows that the "Highest" category dominates the level of application at 69% and the "High" category by 28%. The percentage of the highest application level in the "Highest" category is found in instrument items 1, 2, 4, 5, and 6. At the same time, the percentage of the highest application level in the "High" category is found in instrument item number 3. This data indicates that the values of conservation contained in the long-term vision is appropriate and can be applied in lectures in fields of study that support the vision of the university.

### Table 4. Frequency Distribution of Student Application Levels on Lecture Integration

<table>
<thead>
<tr>
<th>Instrument Items</th>
<th>The lowest</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Highest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>1. Conservation values can be applied to group lectures in the field of study</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2. Material for the field of study can be inserted with conservation material at the beginning of the lecture</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Subjects in the field of study that can be inserted into the pillars of conservation are in each semester</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4. The number of courses is at least 2 to 4 courses</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5. The foundation of conservation education is vital for other subjects</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6. Conservation value learning is very supportive of forming excellent graduate candidates</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
Table 5. Frequency Distribution of Student Application Levels to Long-Term Vision

<table>
<thead>
<tr>
<th>Instrument Items</th>
<th>The lowest</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Highest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The principle of developing conservation values in line with development needs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2. The development of moral values is a necessity to build superior human resources</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. The maintenance of art and culture is the duty of the student community in any field</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>4. The sublime culture inherited from its predecessors must be adequately preserved</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Natural resources need to be preserved as the capital for sustainable development</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. For UNNES, the internalization of conservation values is a strategic vision needed for long-term development</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

3 Discussion

Following the 2017 RENIP UNNES that in the future, conservation learning will become a superior university program in line with the development of superior character values, noble arts and culture, natural resource management, and a wise environment to create future national leaders. On the other hand, it is based on research that conservation insights allow giving direction and guiding attitudes and behaviors that are responsible, polite, and understand the meaning of sustainable development (Saratri, 2016).

Suppose we examine the intention of students concerning real activities related to the character of conservation. In that case, it can be found that personal development, which has conservation value, is closely related to the commitment that is beneficial to society, the belief that carrying out conservation is part of worship, prioritizing the best possible process to achieve the best result. On the other hand, he refuses to cheat and is brave enough to pay dearly for his dignity, ready to sacrifice to help others. This description is a personal picture of the superior character of students as an impact of the process of planting conservation values through lectures.
In the context of the relationship between individuals and the community, conservation principles are found to be guidelines, raise personal awareness towards a culture of excellence, form integrity in achieving future goals, have creative, innovative principles and care for social cohesiveness. This condition is in line with research about students' moral and real behavior on campus (Sarlito Wirawan, 2002).

The application of conservation values as a result of integration in lectures is possible to be applied through lectures in groups of subject areas, at the time of introductory lectures, in general subjects and subject areas of study. Concerning the long-term vision, students who realize and understand that the principle of developing conservation values is a personal need, are believed to be able to build superior human resources in the future, develop a high culture, and develop long-term development vision. The conservation value integration model that can be developed in this research is through lectures in the field of study, through learning general subjects, through real work lecture activities, practical field experiences, through laboratory practicum learning. The completeness that needs attention is the development of RPS per the spirit of conservation values, benefits, and the accuracy of the learning process. Teaching materials that have a significant contribution to conservation behavior, both through digital sources and other sources, can be used by students.

Lecture strategies that can be carried out are FGD (Focus Group Discussion), field visits, student activity portfolios, completion of projects that contain real benefits.

To be able to find out the conservation value that has been received by students, it is necessary to measure the authentic evaluation. What is meant by authentic evaluation is a direct measurement of real behavior or real activities. Through an authentic evaluation process, lecturers can measure the impact of integration conservation learning into lectures in the field of study within the engineering faculty. Through subject areas of study, conservation learning has a meaning that is in line with the learning process in higher education.

3.1 Output Reached

Starting from the research results, the results of this study resulted in a concept of integrated conservation value models in lectures through the preparation of conservation-based RPS, teaching materials that have conservation content, lecture strategies, evaluation techniques, and continued with extra-curricular activities that are related to the material. -the material of the field of study by their respective disciplines. See Figure 1.
4 Conclusion

Based on the data analysis that has been described, the research conclusions can be drawn; 1). Conservation values contained in real activities of conservation character, the process of internalizing conservation learning, lecture integration, and long-term vision can be applied in lectures in fields of study that support the university's vision. 2). Conservation values that are most suitable for lectures in the field of study that support the university's vision are the application of a long-term vision.

Suggestion. 1). Conservation values contained in real activities of conservation character, the internalization process of conservation learning, lecture integration, and long-term vision can be used as references in developing curriculum and learning tools in subject areas of study. 2) Conservation values applied in field subjects studies should be well instilled in all students to support the university's vision.
References

Model for Government Procurement of Good / Services Training

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Department of Civil Engineering, Faculty of Engineering, Universitas Negeri Semarang¹

Abstract. This study aims to: (1) analyze the training model for procurement of goods and services that have been carried out so far, (2) return the training model for procurement of goods and services (3) produce a model that suits your needs. The subjects of this research are training participants of goods and services registered with the Government's Goods and Services Procurement Policy Institute who have graduated. The research location is taken from data in LKPP. The sampling technique uses stratified random sampling, so how to take a sample is divided by age level. Data analysis techniques in this study used research and development (research and development). The results show that of the various training models available, the most suitable and appropriate use the problem-based training model.

Keywords: Development, Education, Goods and Services

1 Introduction

Training is part of investing in human resources (human investment) to improve job abilities and skills, and thereby improve employee performance. Training is usually carried out with a curriculum that is tailored to the needs of the position, given in a relatively short time, to equip a person with job skills (Simanjuntak, 2005).

The implementation of good governance is highly believed to have made a strategic contribution in improving the people's welfare because the implementation of good governance is expected to be able to avoid deviations which are the beginning of acts of corruption and bribery (Kristiadi, 2006).

The procurement of goods/services at government institutions are the main tasks of the government institutions which are not to produce goods/services aimed at profit-oriented, but rather provide services to the public. Therefore, the government needs goods/services in order to improve public services based on logical and systematic thinking, following principles and ethics and based on applicable procurement methods and processes. Training and certification examinations as an effort to improve the competence provided to training participants and the
certification exam for the procurement of goods/services aims to increase the competence and professionalism of participants and their function in goods/services procurement services.

Training planning has not provided maximum results. From the available data, there are only 29,000 of the 102,000 training participants who have successfully passed and are entitled to obtain certificates, or only around 31%. After the participants who passed the training have become procurement officials, more than 50% of them have low competence, graduates have difficulty in dealing with the problem of the procurement of goods/services in their respective institutions. It is suspected that this problem is caused by poor planning for procurement of goods/services, ranging from inaccuracies in determining the learning method which focuses more on lectures, the curriculum that is rarely reviewed, exam questions in the form of case studies that are given a smaller percentage, material memorizing training and textbooks have not led to real-life cases and practices carried out in the field, LKPP has not made a graduation test specifications, the validity and reliability of exam questions have never been carried out, low instructor pedagogical competence, input of training participants who are not selected from the agency of origin. Due to poor planning, the implementation and evaluation stages of the procurement of goods/services training are also not good.

The learning methods have been lectures, brainstorming, question and answer, exercises, and discussions. These methods are not effective for the purposes of training in the procurement of goods/services because: (1) they cannot provide practical experience in the process of procuring goods/services; (2) unable to provide examples of practical problems encountered in the process of procuring goods/services; (3) does not provide examples of practical solutions in the process of procuring goods/services; and (4) does not provide examples of regulatory developments, prices for goods/services in the market, and specifications for prices of goods/services in the market. The four reasons were explained by several representatives from LKPP and the training participants. LKPP explained that the learning methods that have been used need to be reviewed because: (1) examples of cases and their solutions are considered impractical and textual; (2) participants do not feel like they are working in the goods/services procurement department; and (3) they have difficulty understanding the regulations and procedures for the procurement of goods/services.

Theoretically, the lecture method has the weakness that what participants can master because of the lecture is limited to what the instructor can master. This is indeed the most dominant weakness, because what the teacher gives is what he/she is good at, so that what the trainees master depends on what the instructor has mastered. The question-and-answer method has a weakness because it is not easy to make questions that are appropriate to the thinking level and easily understood by the participants. In the brainstorming method, participants are more dominated by understanding the material and being active, while training participants who do not understand the material less and are less active have difficulty following the training material.

Implementation of problem-solving methods requires good planning. Planning must understand well that compiling a plan means trying to systematically decide what to do by the organization in the future to realize certain future conditions that are expected to benefit the organization. Therefore, all plans that are drawn up must continuously pay attention to
efficiency factors, which means that with a variety of resources and limited resources optimal results are obtained.

The Planning of the Training Model in Procurement of Goods / Services Government is based on the pattern of planning of the training related to designing the training can be a solution to the problems of training planning procurement of goods / services Government.

According to Mujiman (2011: 19), training planning is one of the keys to overcoming training problems. The planning of the training can lead to the process of achieving that goal. Planning a good training will manage the training program systematically through these following: identification of training needs, design planning, training methods, develop training materials, training delivery, training evaluation and determination of follow-up training.

A study conducted by Arthur & Bennet (2016) states that gaps in the training effectiveness literature by conducting a meta-analysis of the relationship between defined designs and evaluation features and training effectiveness in organizations. Empirical studies that involve evaluating training programs or measuring some aspects of training effectiveness. The training evaluation criteria obtained additional results indicating that the comparison of the learning criterion with the next criterion, which is the behavior and outcome showed a significant decrease in the effect of learning to this criterion. Then, the researcher found in the meta-analysis that the strong effect of the lectures, as opposed to its poor public image, appeared to be quite effective in practicing certain types of skills and assignments. The effectiveness of multiple training methods for the same content and a single training method across multiple skills and tasks is guaranteed.

Armstrong (2009: 67) argues training is a systematic behavior modification through learning, which occurs because of education, the development of learning and experience are planned. Noe (2010: 351) argues training is an effort planned by an educational institution to facilitate learning about work-related competencies, which include knowledge, skills, attitudes and behavior.

Beets & Goodman (2018) explain that certain aspect of the results of an executive coach training program, and the extent to which the knowledge, skills and attitudes acquired during the program are applied in a practical setting. The method widely used is SCM which follows a mixed methods approach. Six trainers successfully applied the proximal results of the training. The trainers saw the results and value of this training. In addition, identifying the aspects that help and obstruct the result during the implementation of knowledge, skills, and attitudes can lead to suggestions to improve the training. The six successful cases show that these successes help clients become self-correcting, self-producing, and have excellent long-term performance. The results show that the SCM proves to be a useful and practical evaluation tool for conducting evaluation of this training which produces results to motivate future participants and is a practical way to evaluate the success of an intervention.

Gaengreco & Carugati (2019) explain that the evaluation system which allows for the collection of information that is useful to trainees, trainers, and HR professionals as well as the conditions that can be taken to facilitate action in a changing environment. Based on those considerations, the researcher understands the different time frames for developing the
evaluation process. Evaluating follow-up training uses a multi-level model to collect information which includes affective reactions to training, knowledge acquisition and retention, changes in job behavior, and improved organizational outcomes. In dealing with choices and understanding various options, training evaluation is used, and the results are compared with the evaluation method. The evaluation is based in part on Kirkpatrick's model. Kirkpatrick's model is based on the model used in this study, because the instrument allows the identification of indicators that can be quantified in the short term, but their use is limited to the first level. The evaluation at the fourth level is costly because it requires time and costs that cannot be accepted by the certification auditors of quality control and monitoring. Therefore, the evaluation is limited to answering questionnaires on topics such as logistics, content, and worker satisfaction. The procedure is completed when collecting questionnaires and entering data into a correspondent database.

A model is defined as a pattern (example, reference, variety) of something to be created or produced (KBBI, 2015). Learning is an activity of educators in teaching students or placing students in learning conditions (Syahza & Irianti, 2008). The learning model is a design of the learning model used by educators to assist learners to acquire information, ideas, skills, ways of thinking, and expressing their own ideas (Joyce et al., 2011).

The learning model serves as a guide for instructional design and educators in carrying out learning. Choosing a learning model is influenced by the characteristics of the instructional material, the teaching objectives, and the characteristics of the learners. Each learning model has stages (syntax) that learners can do with the guidance of educators (Komalasari, 2011).

Utomo (2016) shows that the factual models, the needs analysis on training was not performed. Therefore, the relevance is low, and the learning process be less attractive and meaningful. In addition, controls were also not carried out effectively so that they cannot assess the reaction and impact of the training.

This study employed research and development design. The development was carried out in three stages: (1) preliminary studies including literature studies, field studies and preparation of prototype products; (2) model development includes product preparation, product validation, product revision, limited trial, and trial result revision; (3) model testing includes product testing through experiments, final product preparation, and product socialization. Product socialization is not carried out with time considerations and the consideration that at the model development stage, a valid model has been produced (Borg and Gall, 2007 : 772).

The output target is to produce a Good/service Procurement Training Model to increase the number of passing participants and effective instructor competencies that can be used in a wider audience. The data were analysed qualitatively and quantitatively on the implementation of the training model. Qualitative analysis was used to describe the results of preliminary study, quantitative analysis was used to the implementation and influence of the developed model. Quantitative analysis was used to analyse the difference (gain) of competency mastery according to its components before the implementation of the model (pretest), with mastery of competencies after the implementation of the model (post-test). Furthermore, the results of the pre-test and post-test were compared between the treatment group instructors and the control group instructors. Therefore, it will be able to determine the amount of net gain, gain is
interpreted by the amount of increase in instructor competence which is more convincing as an effect of the implementation of the developed training model. The effect of implementation model of training to increase the competency is indicated by the comparison between gain score on the treatment group with that on the control group as net gain (Kirkpatrick, 2006).

Factual data collection was performed in all of Indonesia by LKPP and number of certificate holder skills up to the period of 2005 to 2018 consisting of 271,365 people. Methods / Techniques of the current training exists consisted of lecturing, brainstorming, discussion, buzz groups, exercises, and discussions. The current methods and techniques still did not make the goods / services training participants understand the material presented by the instructor. This can be seen in the passing rate on the goods / services procurement certification exam held by LKPP based on the age range.

The results of the planning analysis for the procurement of goods / services that are used as the basis for developing a training model. The development of the training model was conducted by using survey research with the observations of the learning process, interviews with goods / services procurement instructors, and distributing questionnaires to participants who take training and certification of goods / services procurement. Based on the results of the analysis of the survey research, it is recommended to develop a new training model that can overcome some of the problems above and a training model that is able to improve the competence of participants in solving problems related to the procurement in their respective institutions.

2 The Results of Product Validation

Validation of the developed products which include training model, book models, and the learning administration was performed by asking for a expert judgment in the field of Goods / Services procurement. The results of the validation assessment are described in detail as follows.

2.1. Results of Input from the Procurement of Goods / Services Experts from LKPP

<table>
<thead>
<tr>
<th>No.</th>
<th>Assessment Aspects</th>
<th>Information</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Model Clarity</td>
<td>Good</td>
<td>Adjust training needs</td>
</tr>
<tr>
<td>2</td>
<td>Content accuracy</td>
<td>Good</td>
<td>It needs to be adapted to the conditions of the participants</td>
</tr>
<tr>
<td>3</td>
<td>Relevance</td>
<td>Enough</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Systematics Model</td>
<td>Good</td>
<td>We recommend that you add the outcome of the training model</td>
</tr>
<tr>
<td>5</td>
<td>Model outcome</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>
2.2. The Results of Expert Validation

2.2.1. The Results of Validation of Model Book Contents

The results of the recapitulation of the model book content validation can be seen in Table 2 as follows.

Before being used for field trials, the contents of the model book were revised according to input from experts.

2.2.2. Results Construct Validation of Model Book

Before being used for field trials, the construct of the model book was revised according to input from experts. The results of the model book construct validation recapitulation can be seen in Table 3.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Percentage of Validity (%)</th>
<th>Information</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material Planning</td>
<td>86.5</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
<tr>
<td>2</td>
<td>Material Delivery Planning</td>
<td>77</td>
<td>Valid</td>
<td>feasible</td>
</tr>
<tr>
<td>3</td>
<td>Instructor’s material mastery</td>
<td>86</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
<tr>
<td>4</td>
<td>The Content of the training the Material</td>
<td>88</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
<tr>
<td>5</td>
<td>Purpose of the training Material</td>
<td>77.5</td>
<td>Valid</td>
<td>feasible</td>
</tr>
</tbody>
</table>

### Table 2. Recapitulation results of the validation of model books

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Percentage of Validity (%)</th>
<th>Information</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material Planning</td>
<td>86.5</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
<tr>
<td>2</td>
<td>Material Delivery Planning</td>
<td>77</td>
<td>Valid</td>
<td>feasible</td>
</tr>
<tr>
<td>3</td>
<td>The Content of the training the Material</td>
<td>88</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
<tr>
<td>4</td>
<td>Material Purpose</td>
<td>77.5</td>
<td>Valid</td>
<td>Well feasible</td>
</tr>
<tr>
<td>5</td>
<td>Material Evaluation</td>
<td>85</td>
<td>Very Valid</td>
<td>Very feasible</td>
</tr>
</tbody>
</table>

Conclusion: 82.8

Very Valid

Very feasible

### Table 3. The Expert Validation of the Model Book Construct during the Trial

Before being used for field trials, the contents of the model book were revised according to input from experts.
### 2.2.3. Validation Results of the Evaluation Sheet

The recapitulation of the validation on the evaluation sheet can be seen in table 4.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Percentage</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The Planning of the Training Material</td>
<td>77</td>
<td>Valid</td>
</tr>
<tr>
<td>2.</td>
<td>The Content of the training Material</td>
<td>79</td>
<td>Valid</td>
</tr>
<tr>
<td>3.</td>
<td>Material Evaluation</td>
<td>77.5</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>77.5</td>
<td>Valid</td>
</tr>
</tbody>
</table>

### 2.2.4. Validation Results Keterlaksanaan Sheet P Training

Validation Recapitulation of the learning feasibility can be seen in table 5.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Percentage</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Instructor</td>
<td>81.5</td>
<td>Very Valid</td>
</tr>
<tr>
<td>2</td>
<td>Training materials</td>
<td>83</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3</td>
<td>Training Facilities</td>
<td>76</td>
<td>Valid</td>
</tr>
<tr>
<td>4</td>
<td>Training Planning</td>
<td>76.5</td>
<td>Valid</td>
</tr>
<tr>
<td>5</td>
<td>Training materials</td>
<td>78</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>78</td>
<td>Valid</td>
</tr>
</tbody>
</table>

### 2.3. Product Revisions

Product revisions based on the results of expert validation include input models, guidebook, and learning administration. Feedback from experts who have assessed the model and the training model book in the procurement of goods / services based on the problem solving related to aspects of instructors, training materials, training facilities, and Planning was used.

#### 2.3.1. Design of Training Management Model of Goods / Services based on Problem Solving
The design of the training management model for the procurement of goods / services is designed based on: (1) a description of the factual model, and (2) a needs analysis regarding the training model for the procurement of goods / services expected by the respondent.

**Fig 1. Design Management Model**

2.4. Training Planning

The training planning aspect includes: (1) identification of needs; (2) training objectives, and (3) preparation of training programs and packages.

Identification of needs is required to determine the training materials relevant to the needs of training participants. The identification of training needs was carried out by analyzing the needs of the training participants for the procurement of goods / services. Each sub-division is represented by 1 participant, by analyzing the mastery of competencies, which competencies that are owned and needed. In addition, it also analyzes the training material that has been provided so far. Based on the preliminary data, a training requirement for the procurement of goods / services was designed.

Formulating training objectives is very important to direct all training activities to achieve the competencies required by the trainees. This goods / services procurement training aims to: (1) improve the competence of procurement officials; (2) provide knowledge about the concept of procurement of goods / services; (3) developing the ability to implement the procurement of goods / services.

The next stage is the preparation of a training program, which aims to provide practical guidance during the training. The content of the training program, namely; (1) program structure, training materials, and training time; (2) description of the training objectives; (3)
description of training results and impacts; (4) training schedule; and (5) preparation of goods / services procurement training packages.

The preparation of a training package for the procurement of goods / services is a the content of the training material related to the competencies that will be provided to the training participants. Preparation of the training program of procurement of goods / services include: (1) training management guidebook, (2) instructional materials in the form of training modules (3) identification of necessary resources include: identification of those involved in the training, training facilities, tools and materials, and training room facilities.

2.4.1. Hypothetic Model of Training Management

After the design of the training for procurement of goods / services has been successfully compiled, the design was then consulted with experts and practitioners. Evaluation from experts as practitioners is aimed at assessing the feasibility of a training management model guidebook and training module for goods / services procurement.

Table 6. Experts and Practitioners Input to the Design of the Training Management Model

<table>
<thead>
<tr>
<th>No.</th>
<th>Assessment Aspects</th>
<th>Information</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Model Clarity</td>
<td>Good</td>
<td>Adjust training needs</td>
</tr>
<tr>
<td>2</td>
<td>Content accuracy</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Relevance</td>
<td>Sufficient</td>
<td>It needs to be adapted to the conditions of the participants</td>
</tr>
<tr>
<td>4</td>
<td>Systematics Model</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Model outcome</td>
<td>Good</td>
<td>We recommend that you add the training model outcome</td>
</tr>
</tbody>
</table>

2.5. Final Model of Training Management

To obtain a final model of training for procurement of goods / services, a field test was conducted after the hypothetic model has been formulated. The test was done for two times: (1) limited testing, (2) field testing. In each testing, the participants were given a pre-test, training material through the learning process, and a post-test. Participants were also given a questionnaire to assess the appropriateness of the training material, instructor competence, and training planning.

2.5.1. Discussion

Needs Assessment for the Planning of Goods / Services Procurement Training. The results of the needs analysis for the training planning for the procurement of goods / services illustrate that most of the participants really expect the training to be able to improve the competence of participants in the field of goods / services procurement to assist in the implementation of the procurement of goods / services in their respective agencies. In addition, the participants really hope that their
limited understanding of the concept, the problems that occur in the implementation of goods / services procurement can be resolved. In general, the need for training planning is very much needed in the training of procurement of goods / services. The description above is in line with the opinion of Arthur and Bennett (2006), Mujiman (2011: 19) that training is required to support the competence, help master the knowledge, skills and develop attitudes to project positive energy on the perspective of quality performance that will result in the loyalty to the job.

Goods / services procurement training provided to employees of government agencies, state – owned enterprise, regional government – owned enterprise and the private sector is to provide knowledge, skills and attitudes to improve competence in the field of procurement of goods/services. This is in line with the opinion of Armstrong (2009: 67) that training is a tool for human resource development that aims to help master skills and correct deficiencies in carrying out work.

2.5.2. Goods / Services Procurement Training Planning

The trend of the planning model for the procurement of goods / services that is expected by procurement officials. Basic Level Procurement of Goods / Services Training is a training that can provide initial provision for participants to take the Basic / First Level procurement certification exam.

2.5.3. Planning Model of Goods / Services Procurement Training

The results of expert validation tests on the training model provide very good value and can be used in goods / services procurement training. This means that a hypothetical model of planning the training of procurement of goods / services have met the principles in the management of training, so that the model can improve the competence of trainees, as well as allow it to be applied to the planning of training of procurement of goods / services in the place of others.

2.6. Procurement Training Management Guidebook

The guidebook for procurement planning training is a guide that contains the model of the training and planning training. The book of the model of planning of training the procurement of goods / services being developed entitled "The Guidelines for Planning Training Management for Goods / Services Procurement". Framework contents of this handbook include: (1) the introduction, which includes these following subtitles: background, training model and rational models; (2) the planning of training, which includes these following subtitles: training needs identification, the selection of training; (3) training preparation, which includes these following subtitles: administrative preparation and technical preparation. In general, based on the results of evaluations with education management experts, training experts, and goods / services procurement experts, it shows that the product / service procurement training guidebook is conceptually good and is suitable for use as a guide for conducting goods / services procurement training. Some
improvements that need to be done are as follows: (1) clarity of tasks from the organizer of the training, (2) assessment of training completion, (3) the allocation of increased training time, (4) the use of the term language of a sing supplied with Indonesian be more easily understood.

2.6.1. Goods / Services Procurement Training Module

Based on the results of the assessment by education management experts, training experts and goods / services procurement experts, it shows that the training module product is conceptually good and suitable for use by the training participants as a module in goods / services procurement training, although there are several things that must be improved as inputs.

The developed module was stated to be feasible because it provided enormous benefits to the training participants in understanding the training material. The developed module stated: (1) providing knowledge and skills of procurement of goods / services systematically, (2) presenting case studies of procurement of goods / services and implementation of procurement of goods / services in the field, (3) fostering independent attitudes and cooperation of participants.

This is in line with Noe's opinion (2010: 351) that training has a positive effect on the quality of trainees, both individually and socially. The same thing was stated by Beets & Goodman (2018) which states that the training module is teaching material that is compiled in a comprehensive and systematic manner in the form of a manuscript by paying attention to these following things: (1) the module must contain complete information, (2) the module helps training participants understand the training material, learn it, and completing assignments or exam exercises required by the module itself, (3) the module content is divided into chunks according to its sub-topics, (4) the modules are arranged based on an outline of the learning content and training planning with reference to the syllabus, competency standards and basic competencies.

2.6.2. Participant Assessment of Goods / Services Procurement Training Planning Model

In planning the training management model for procurement of goods / services from limited test, the field test showed that the training management model for procurement of goods / services resulted from this development was easier for the training participants to understand and implement. Implementation of this training model provides a real experience in management training and trainees in understanding the training materials the procurement of goods / services based on the problem solving.

The description above is in line with the opinion of Gaengreco & Carugati (2019) which states that training is a series of activities designed to increase skills, knowledge and experience which lead to a change in attitude. The training is directed to help trainees improve their competence. This goods / services
procurement training is also a series of activities that are well managed to help participants increase their knowledge and provide experience in procuring goods / services.

This is also in line with Syahza & Irianti (2010) that the competence of learning outcomes is the birth of behavioral competencies, problem solving, and expression results. Goods / services procurement training which contains goods / services procurement activities will provide benefits to training participants in the form of increased competence, especially knowledge, competencies, and problem solving. According to the description of Joyce et al (2011), training has a good influence on training participants.

2.7. The Final Results of the Development of the Planning Model for Goods / Services Procurement Training

The discussion of the planning model for the procurement of goods / services training is inseparable from the results of the analysis of expert judgment and information on the results of research on the procurement of goods / services. Training made through stages from the draft model developed then resulted in an initial draft of the model which was then reprocessed after going through expert and practitioner validation. The results of the model were then tested, revised and then the final model was generated.

In this goods / services procurement training model, the training cycle is devoted to the implementation of training and training evaluation. The implementation of the training is aimed at adults as the target, as explained by Gibb (1983) that in adult learning, it is necessary to pay attention to several aspects: (1) learning must be shown on the main problem or the needs of the participants; (2) the experience given must be meaningful; (3) training participants must know the feedback from the training given; (4) training participants are given the freedom to share their experiences; (5) training can stimulate and increase the imagination of the facilitator or instructor in developing training materials; (6) involving training participants in achieving training objectives. Furthermore, the training evaluation is conducted to measure the success in achieving the training program objectives. Effective evaluation contains three variables, namely: material, participants and facilitators (Utomo, 2016). The evaluation carried out in this goods / service procurement training management is an evaluation of the reaction and impact of the training. This evaluation stage is carried out to determine the success of the training, with this activity it is expected that the training participants can absorb the material given. Furthermore, training program evaluation is an evaluation that is carried out to assess the overall program of activities, and the results will be used as input for further training development. In this activity what is assessed is not only the results but also the training process. Therefore, a comprehensive and objective picture of the training program is obtained.
2.7.1. **Excellence Model Planning Training Goods / Services Procurement**

A model from results from a study must have advantages to be useful for users. The training planning model for procurement of goods / services has the following advantages:

a. It has a high value of validity, after conducting trials according to stages, and validating the model with expert tests showing a mean of 3.86. The results of the participant assessment test showed a mean value of 3.83 (measurement scale 1 to 4).

b. It has practical value in applying the model. The training management model for the procurement of goods / services because of this development is practical in its implementation both for training providers, instructors and training participants. Management functions used are planning, actuating, controlling. Planning (planning) consists of three stages, implementation (actuating) five stages, and evaluation (controlling) two stages.

c. Its usefulness of training management model of the procurement of goods / services is easily implemented and understood by the participants, the training management model the procurement of goods / services can improve the effectiveness of training, this fact is supported by the results of the expert evaluation with a mean value of 3.86 and a limited experiment through training on participants by showing the level of assessment of the high training model with a mean of 3.78 (measurement scale 1 to 4).

The implementation of the goods / services procurement training management model will provide real experience in managing the training, so that participants can increase their competence in the field of goods / services procurement which will be useful in teaching the field of goods / services procurement development. Guidelines for training management models for procurement of goods / services explain the functions of planning, implementation, and evaluation.

Guidebook for the training management model for the procurement of goods / services must be carried out by the organizers of the training activities for the procurement of goods / services so that the implementation of the training can run effectively and efficiently.

a. Model and a training package developed direct procurement officials in understanding the procurement of goods / services in depth by focusing on kategori the procurement of goods / services for the organizers of the training activities optimally organize special training.

b. Train participants to improve knowledge, skills and develop goods / services procurement

c. Problem solving based goods / service procurement models and packages can improve skills, knowledge, and abilities according to future needs.
2.7.2. Limitations of the Goods / Services Procurement Training Management Model

The results of the validation test by a team of experts and limited experiments showed that the management model of training the procurement of goods / services development results have a high level of effectiveness, but the final model still has some weaknesses, including:

a. The problem solving-based goods / services procurement training management model still needs a wider examination because the population used only comes from a few goods / services procurement training.

b. Management of problem solving-based goods / services procurement training requires a large amount of money related to problem solving based assessment of training completion, facilitators, and other training support facilities.

c. The achievement of this problem-solving based goods / service management training model still requires other development and testing steps.
REFERENCES


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