



## ANALYSIS OF LEARNING COMPETENCY ENGINEERING STUDENTS VOCATION D 3 FT UNP

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**ABSTRACT:** This study aims to calculate the level of achievement: (1) the competence of D3 vocational students in the implementation of machining engineering learning, and (2) the difference in student learning achievement between expectations and reality. The research method is descriptive quantitative. The population of this study is all students, vocational engineering engineer D3, as many as 281 people. The sample was chosen by a random sampling of 120 people. Data were collected by questionnaire and documentation. Data analysis is done descriptively, and comparative. The result of the research shows: (1) the learning that is taking place now in the D3 program of the mechanical engineering vocational program of FT UNP is not suitable between student expectation, and (2) there is the difference between student expectation with present lecture achievement.

Keywords: Analysis, learning competence, D3 student, vocation, machining technique

### 1. INTRODUCTION

The direction of vocational education policy in Indonesia according to Law No. 20 of 2003 on National Education System explained that vocational education is a higher education that prepares students to have a job with a particular applied skill maximal equivalent to a degree program. Vocational education should be developed toward a system in the national interest, and this encourages the Directorate General of Higher Education to formulate a series of higher education development policies. For this purpose, a long-term development framework for Higher Education was further developed to be a higher education long-term strategy (HELTS), in which the contents of a long-term strategic development plan aimed at placing a national higher education system, with all the limitations which is in the best position in the future in order to be able to respond effectively to the challenges faced. HELTS formulates three main strategies of developing higher education, namely nation's competitiveness, autonomy and decentralization (autonomy), and organizational health.

Furthermore, Government Regulation No. 19 of 2005 on National Education Standards article 26 paragraph 3 Competency Standards Graduates of a vocational secondary education aims to improve intelligence, knowledge, personality, noble character and skills of learners to live independently and follow further education in accordance with vocational programs.

In line with that, the competence of Vocational education graduates refers to the existing Indonesian Working Competency Standards (SKKNI) as a reference, to certain

industry standards that become partner industries. This competency can be achieved with an educational and training approach that refers to the criteria of business skills/industries that are accomplished through training in the production process or using the production process as a vehicle for learning. This training can take place in the industry, through direct involvement of students in the production process, or in schools through the involvement of students in the process of productive learning and production processes in the school's production units.

Vocational Education, especially on productive programs that suit the field of expertise, ideally required to apply learning approaches that can provide learning experiences to learners in the mastery of competence in accordance with the demands of the business and industry. The learning approach consists of Competency Based Training, Production Based Training, and Industrial Based Training. By applying this learning approach is expected to provide a learning experience to learners in the mastery of all competencies that must be mastered in accordance with National Competency Standards so that they are able to compete in the world of work.

Renewal as an idea, idea, educational practice that is realized as a new idea that can be adopted by schools in the form of certain practices of an outcome of thinking and technology that is applied through learning stages are believed and intended to solve the problem of learning and improve a processes that occur in educational institutions. In the field of competency of machinery engineering, for example, to solve the problems faced by schools, many models of learning have been expressed in various fields such as CTL



(Contextual Teaching and Learning), CL (Cooperative Learning) DL, (Direct Learning) , PBL (Problem Based Learning) and active, creative, effective, and fun learning (Pakem). All of them are meant for renewal can be done and used for improvement and solving education problem in the country.

Efforts to improve reforms in the competence of machining techniques in accordance with Law No. 20 of 2003 on National Education System article 15, stated that vocational education is secondary education that prepares students primarily to work in a particular field. In particular the competing objectives of engineering expertise are to equip learners with the skills, knowledge, and attitudes to be competent: (1) to work either independently or to fill the existing job vacancies in the business world and the industrial world as middle-level workers in the field of machine tools Technology 2) choosing a career, competing, and developing a professional attitude in the field of Machine Tool Technology.

This goal will be achieved if SMK has developed a model of learning and mastering the field of education and technology that is integrated with the value of the character, as part of science and technology grow and develop. BNSP (2009) formulated that the Indonesian nation is required to develop human resources with the following competencies and expertise; (2) Ability to communicate and work effectively, (3) Ability to create and update (creative and innovative), (4) Ability to develop and utilize information and communication technology, and (5) Able to learn and adapt contextually with the environment.

Learning is meaningful, student-centered (Student-Centered Learning). The standard learning process is focused on exploratory learning, elaboration, confirmation, observation, questioning, processing, reasoning, presentation, summarizing, summarizing and creating. This direction can be an indication that the learning approach is student-centered (Student active learning).

## 2. LITERATURE REVIEW

Wena (2009) explains the learning strategies of laboratory training including group formation, material presentation, practice/practice, and practice/practice of real problems. Baillie and Hazel (2003) suggested forms of learning activities in the laboratory, namely: controlled exercises, investigations. Practical learning in this collaboration is aimed at the implementation of learning in accordance with the purpose of learning in the control of competence as written in the standard of competence that became the basis of curriculum preparation. Learning in the laboratory is a very important part of the learning process.

Learners will learn and always remember more information after practicum in the laboratory.

The main task of a teacher is to carry out the learning process, both in class, workshop and laboratory. Creative and innovative teachers will always create ideas in designing new learning models that enable learners to achieve their learning objectives with satisfaction. To obtain the new learning model is needed method of research and development of learning model. Learning model development methods produce products that are not too risky to targeted learners.

The inability of teachers in developing critical thinking skills in learning, because some teachers are not able to plan the learning process well. Planning learning is very important to implement because planning is a process and way of thinking that can help create the expected results (Sanjaya, 2008). The 2013 curriculum provides opportunities for teachers to apply the learning process that includes the selection of innovative models, methods, approaches. Currently, the developed curriculum is required to change teacher-centered learning into student-centered learning. This is in accordance with the demands of educational future that the child has critical thinking skills.

The design of learning model development can be analyzed from a series of functions of educators in carrying out their main tasks in learning that is from designing, implementing to evaluating. The learning model developed is broad, because the model consists of input, process and output components. Learning input components consist of the characteristics of learners, teacher characteristics, infrastructure and learning support tools. The process component focuses on strategies, models, and learning methods. The output component is the result and impact of learning.

The terminology of learning strategy (instructional strategy), learning approach, and model of learning is sometimes interpreted as a similar term. According to Joyce and Weil, (2009) Model of teaching can be interpreted as a model of learning, which is a long-term learning pattern that can improve student's capability, able to learn more easily, effectively and efficiently, so they can act as a reliable learner. Further described that the implementation of a model of learning will have a major impact on the development of the ability of learners in their own learning. Effective learners will be able to construct a variety of information and knowledge, have ideas, build creativity by utilizing various learning resources, including teacher policy in facilitating learners with effective and reliable learning patterns.

## 3. METHODS

The type of research conducted is classified as descriptive quantitative. Population in this research

is all student of D3 vocational Department of Mechanical Engineering much 281 people. Samples are selected by random (random sampling). as many as 80 people.

The instrument used in this research is a questionnaire developed by the researcher, according to the current condition and the expected condition of D3 vocational graduates. Questionnaires that have been prepared are tested, namely the validity test and reliability test with the number of respondents as a trial as many as 30 people. Validity test is done by Product Moment Pearson correlation analysis and reliability test using Alpha Cronbach formula. In testing the validity, the real level is determined  $\alpha = 0.05$ . The statement item is declared valid if the coefficient of product moment correlation or  $r$  arithmetic is

greater than  $r$  table, according to the specified real level. The test results show that the reliability coefficient of 0.92. The criterion used to establish instrument reliability is if the reliability coefficient is large or equal to 0.50 (Gay, 1985).

Data analysis is done, that is descriptive analysis, used to explain score of learning process according to student opinion. Furthermore, to measure the difference between expectation and reality from learning process achievement used different test (T-test)

#### 4. Results and Discussion

Based on the analysis result obtained competence of Machinery Engineering according to student opinion, as shown in table 1. 1.

Table 1. Student Attitudes In The Learning Process

Condition Now		Statement	Conditions of Hope	
Average	Category		Average	Category
3,36	Good	1. Student shows activity at the time of learning process	4,77	Very Good
3,22	Enough	2. Students show motivation in learning	4,64	Very Good
3,39	Good	3. Students seem to be very happy about learning	4,61	Very Good
3,37	Good	4. Students express opinions or ideas on the learning process	4,67	Very Good
3,13	Enough	5. Students respond to friends' opinions during the learning process	4,62	Very Good
3,36	Good	6. Students on time hand over learning tasks	4,67	Very Good
3,22	Enough	7. Students are able to solve problems (problem-solving) in group learning	4,56	Very Good
3,36	Good	8. Students are able to think creatively and innovatively in learning		Very Good
3,36	Good	9. Students take decisions (decision making) in learning	4,52	Very Good

Table 2. Knowledge Of Students In The Learning Process.

Condition Now		Statement	Conditions of Hope	
Average	Category		Average	Category
3,36	Good	1. I like the teaching materials are available in the form of modules according to the syllabus..	4,58	Very Good
3,47	Good	2. I love the learning process takes place using the method of demonstration.	4,55	Very Good
3,25	Enough	3. I love the ongoing lesson with situations that please the students.	4,46	Good
3,48	Good	4. I like learning with a variety	4,55	Very Good
3,25	Enough	5. I show creativity in learning	4,56	Very Good
3,53	Good	6. I love skills, techniques that vary in learning	4,60	Very Good
3,48	Good	7. I am indicated with consistent enthusiasm and high interest in teaching	4,55	Very Good
3,39	Enough	8. I get the tasks regularly	4,54	Good
3,56	Good	9. Have students been given the opportunity to be actively involved in the learning experience	4,56	Very Good
3,57	Good	10. I provide teacher-approved input, accepted, and if possible apply it to the lesson	4,56	Very Good
3,21	Enough	11. I use an inspirational analogy and help students in a timely manner.	4,64	Very Good

Table 3. Skills in the Learning Process.

Condition Now		Statement	Conditions of Hope	
Average	Category		Average	Category
3,36	Good	1. I am able to read Engineering drawings	4,58	Very Good
3,47	Good	2. I am capable of designing image of machine components (single) to the specification required.	4,48	Very Good
3,47	Good	3. I am capable of designing image of machine components assembly accordingly the specs are in need.	4,56	Very Good
3,48	Good	4. I am able to draw good machine components single or assembled according to the rules Engineering drawings	4,55	Very Good
3,25	Enough	5. I am able to calculate engine speed for each type of work within make workpiece.	4,56	Very Good
3,53	Good	6. I am able to choose tools in accordance with the Job Sheet provided.	4,60	Very Good
3,48	Good	7. I was able to install the tool on the machine as per the Standard Operational Procedure (SOP)	4,55	Very Good

Table 4. Learning Process In Higher Education According To Student Opinion

Test Statistics <sup>b</sup>				
	Kondisi Harapan Kondisi Saat Ini	Kompetensi Harapan Kompetensi Saat Ini	Pembelajaran Harapan Pembelajaran Saat Ini	Sarana Harapan Sarana Saat Ini
Z	-6.510 <sup>a</sup>	-6.392 <sup>a</sup>	-6.495 <sup>a</sup>	-6.458 <sup>a</sup>
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Based on Table 1.4 it can be concluded that there is a significant difference between the expectations and current conditions, where the value of  $P < 0.05$ . This means that there is a significant difference between the expectations condition and the current condition, the competence of expectations and the competencies of current achievement, learning expectations.

## 5. DISCUSSION

The paradigm of learning model analysis begins with the desire of the teacher to meet the needs of his students, along with rapid technological advances, the learning becomes more complex. Therefore, learning needs a design model that is appropriate and fits the needs of students. Various theories, methods, designs, and models of learning should be created to appreciate the increasingly diverse level of students' needs. This is the essence of learning itself, namely how teachers create a better life for learning that is able to absorb students' aspirations appropriately. Rustaman, (2001). explain learning is an activity of interaction

between teacher-student, happened reciprocal communication which takes place in an educational situation to reach learning purpose The learning process, teacher and student are two component that can not be separated. Between the two components must be interacted with each other support for student learning outcomes can be achieved optimally.

Learning is a process that contains a series of learning implementation plans by teachers and students on the basis of reciprocal relationships that take place in educational situations to achieve learning objectives. Reciprocal interaction between teachers and students is a major requirement for the ongoing learning process. The reality that appears in schools, teachers are often too active in the learning process, while students are made passive, so the interaction between teachers and students in the learning process is not effective. If the learning process is more dominated by the teacher, then the effectiveness of learning will not be achieved. To create effective learning conditions, teachers are required to be able to manage the learning process



that provides stimulus to students so that they are willing and able to learn.

Learning can be interpreted as "all efforts or teaching and learning process in order to create an effective and efficient learning process" (Bafadal 2005, Winkel 1991). Learning occurs when the child responds to the stimulus provided by the teacher, in addition, to achieve effective learning of learners can also be guided by the Master from their previous knowledge which is stored in their memory and thought by using the appropriate method of learning. If that has not happened then the learning process will not be a competent student. Improving the quality of learning is one part that can be solved by performing a needs analysis to assess the gap between the competencies achieved by current students if compared with the expected competence based on student opinions. They also asked the opinion of students with regard to the implementation of learning process and training conducted in schools between the current state of now with their expectations.

Desertion between hope and the current situation is a problem that must be explored in order to improve the quality of graduates, at least close to the needs of the world of work. The world view of work on the competence of college graduates generally still not meet the expectations of the world of work. Therefore, this research tries to bridge the gap that is happening now, by recommending the analysis of learning as one effort to improve the competence of graduates.

Competence can be interpreted as the ability of individuals to show their work in accordance with the required standards. Another definition describes competence as the capacity, qualification or behavior that a person carries out to carry out his duties and functions effectively. Competence as a skill or ability is also proposed by Roe (2001) as follows: Competence is defined as the ability to adequately perform a task, duty or role. Competence integrates knowledge, skills, personal values, and attitudes. Competence can be described as the ability to perform a single task, role or task, the ability to integrate knowledge, skills, attitudes and personal values, and capability to build knowledge and skills based on experience and learning.

## 6. CONCLUSION

- a. The learning process is all the efforts undertaken by teachers and students to share and process information, in the hope that knowledge, skills, and attitudes are useful in students and become a competency that has a sustainable

- b. A good learning process will shape the intellectual ability, critical thinking and the emergence of creativity and behavioral or personal changes a person based on certain practices or experiences.
- c. Generally, students are confident enough to operate various types of production machines, but they have not been much involved in production activities.

## 7. SUGGESTION

- a. It is expected that there are better changes to achieve a positive improvement marked by changes in individual behavior in order to create an effective and efficient learning process.
- b. Learning model based on production recommended for many dikonstruksi by lecturers to be applied in the learning process.

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