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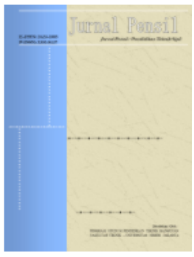

IMPLEMENTATION OF BASIC COMPETENCIES IN SURVEYING TECHNIQUES AT SMK CONSTRUCTION AND PROPERTY ENGINEERING EXPERTISE PROGRAMS

Muhammad Haristo Rahman[1], Tuti Iriani[2], Irika Widiasanti[3]*

[1] Pendidikan Teknik Bangunan, Fakultas Teknik, Universitas Negeri Makassar
Daeng Tata Raya Parang Tambung, Kota Makassar, Sulawesi Selatan 90224, Indonesia

[2] Pendidikan Teknik Bangunan, Fakultas Teknik, Universitas Negeri Jakarta
Jalan Rawamangun Muka, Rawamangun, Jakarta Timur, DKI Jakarta, 13220, Indonesia

[3] Teknologi Rekayasa Konstruksi Bangunan Gedung, Fakultas Teknik, Universitas Negeri Jakarta
Jalan Rawamangun Muka, Rawamangun, Jakarta Timur, DKI Jakarta, 13220, Indonesia

[*1]haristomuh@gmail.com [2]tutiiriani@unj.ac.id [3]irika@unj.ac.id

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Abstract

This study aims to obtain complete information about the implementation Of Education Process Standards at SMK Construction and Property Engineering Expertise Programs in Jakarta. Research related to how Implementation of Learning Land measurement engineering subjects to achieve the expected competency in accordance with the established basic competencies, and what factors are done by the teacher to achieve the competence of Surveying Techniques. This research is intended in a qualitative descriptive study. The data source was obtained from interviews with the deputy headmaster of the curriculum section and the teacher of the subject of Surveying Techniques as well as the basic competency documents and the Learning Implementation Plan (RPP). Data collection procedures carried out by observation, in-depth interviews, and documentation. The analysis is done by describing and interpreting the data from interviews and documentation studies and checking the validity of the data is done by triangulation. From the results of research conducted the implementation of the standard process in learning Surveying Techniques goes well by paying attention to predetermined standards namely planning, implementation and assessment by attention to the cognitive, affective, and psychomotor elements of students.

Keywords: Process Standards, Competencies, Surveying Techniques

Introduction

Education as a concrete step carried out in the development of self-potential to be able to become a reliable Human Resources (HR) to compete in the global world. Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious psikis strength, self-control, personality, intelligence, noble character, and skills needed for themselves, society, nation and state (Ilham & Afriansyah, 2019; Masykur, 2019; Sistem Pendidikan Nasional, 2003; Widjajanti, 2018; Yulia & Amirudin, 2021). In the context of education in Indonesia, the education system implemented aims to develop capabilities and shape character based on the level of education that is taken.

To realize these educational goals, the government through the Center for Education Standards and Policy implements eight educational standards which contain minimum criteria for educational components according to their respective educational levels. Currently, the National Education Standards are contained in Government Regulation Number 32 of 2013, which consists of content standards, processes, graduate competencies, educational staff, facilities and infrastructure, management, financing, and educational assessment (Hidayat et al., 2020; Mayresta, 2020; muhammad alfarisi & Afriansyah, 2019; Surmilasari et al., 2022; Triwiyanto, 2013).

Vocational education as one level of education in Indonesia. Vocational education as an inseparable part of the development of society and provides construction to improve the economy of a nation. Vocational education and training as a place to prepare knowledge that is knowledgeable, skills, and personality to meet the expectations of the world of work and industry (Chan et al., 2022; Hanafi, 2013; Sudira et al., 2018; Utami et al., 2022; Yulia & Amirudin, 2021). The vocational education process is directed to prepare students to enter the workforce. Vocational Schools are educational organizations with expertise competency models or fields of expertise. To improve the quality of education in vocational schools, the government divides the spectrum of expertise in accordance with the demands of the needs related to labor.

One of the national education standards at the vocational school level is the process standard. Process standards are one of eight standards defined as criteria related to the implementation of teaching carried out in educational schools to achieve the expected understanding of student competencies. Process Standards As a criterion in applying learning in the education unit to achieve graduate competency standards. The dimensions of learning in schools generally include three things, namely planning, implementation, and assessment. But unlike education in general high schools, the standards of the vocational school learning process aimed at increasing the effectiveness of graduates in accordance with the basic competencies of each subject, the learning process carried out in vocational schools is divided into two stages, namely learning in class and practice.

Process standards that contain minimum standards of learning processes are often used as a teacher's guide in managing learning. Although the standard criteria for the learning process guide have been provided. Implementation of learning undertaken by teachers in the field considered to affect the enforceability and the success of the implementation of standards in the learning process. Rusman (2017) states that characteristics of the learning process are adjusted to the characteristics of competencies, the characteristics of the learning process in high school or in vocational schools are based on subjects.

One of the subjects that exist in vocational schools is subject to Land Measurement Techniques. Land measurement engineering are subjects that become the basis of building construction, sanitation, and maintenance competencies with C2 content (Basic Skills Program) in the curriculum applicable at vocational school.

The charge C2 in the curriculum interpreted as a charge on subjects of core competencies and basic competencies to the scope and depth of material and study load is the same for all competencie similar expertise in the construction and program expertise Technology Properties.

Frick (1979) states that land measurement techniques can generally be considered a scientific discipline that includes all methods for gathering and processing information about the earth and physical environment. as an example of the data generated in the measurement of soil used as reference in planning, maintaining roads, highways steel, building systems and bridges, irrigation canals, dams, sewers, carved up land mines and tunnels.

Surveying Techniques is one science that is needed for work in the construction of the building, so through learning the land measurement techniques, the learners are trained to acquire knowledge and skills to analyze perform measurement methods, identify measuring equipment, etc. that will be used in the work of the construction world. Based on the statement, the subject of soil measurement techniques becomes important to learn and apply in the learning process to the maximum so that the resulting competency of graduates can be maximized.

Jakarta 26 Vocational High School is the only school in Jakarta with Construction and Property Engineering Expertise Programs. with a four-year educational program. Schools in applying the educational standards process, conducting teaching by referring to core competencies and basic competencies in accordance with decisions about core competencies and basic competencies namely national subjects (a), contents of entrepreneurship (b), basic fields of expertise (C1), expertise programs (C2), and Expertise Competency (C3) planned by the Ministry of Education.

Based on the results of interviews conducted with teachers of land measurement techniques in Jakarta 26 Vocational High School. Land measurement techniques should be taught in class X (10) according to the applicable curriculum, but there was a change in the process of implementing learning, which is done in class XI in connection with the need for accuracy and agility of students in carrying out measurement practices using land measurement tools. While the results of interviews with some students who study these subjects say that what is taught by teachers tends to be boring. This is due to the presentation of monotonous learning material, and when practising in the field the conditions of the air feel hot and make students take measurement practices, so students are less enthusiastic which can lead to less interesting lessons. While the competence of the results of learning this Land measurement technique is very useful to become students in the world of work later when graduated from vocational school.

Based on these descriptions, researchers are encouraged to conduct a study entitled "Implementation of Basic Competencies in Surveying Techniques at SMK Construction and Property Engineering Expertise Programs". This study refers to how the implementation of learning process standards in the subject of soil measurement techniques in accordance with the competency standards contained in the 2013 Curriculum to obtain an overview of the learning process in the classroom and practical learning in the field. In addition, it can be seen whether the learning process is in accordance with the specified process standards or still encounters various obstacles. Through this research, it is hoped that it can provide information on the implementation of standard learning processes for measuring soil techniques that are useful for improving the learning process in the future.

Research Methodology

The method used in this research is descriptive qualitative method. Research using a qualitative descriptive design format aims to describe, summarize various conditions, various situations, or various reality phenomena that are the object of research, and attempt to pull that reality to the surface as a feature, characteristic,

character, model or a description of a particular situation, condition, or phenomenon (Bedewy & Lavicza, 2023; Bungin, 2007; Putri, 2022).

Related to this study, researchers illustrate the process of learning in class and practical learning on subjects of land measurement techniques based on basic competencies to dig deeper about the implementation of the standard processes in learning carried out. This research was conducted at Jakarta 26 Vocational High School having its address at Jl. Balai Pustaka Baru No.1 Rawamangun, East Jakarta, Indonesia. Data collection procedures used are interviews, observation, and documentation studies such as basic competencies and Learning Outreach Plans (RPP) prepared by subject teachers. Interviews were conducted with the Vice Principal in the curriculum field as well as the Teacher in Land Measurement Engineering. Data analysis was carried out in line with data analysis presented by Miles and Huuberman which included three concurrent activities, namely (1) data reduction (2) data presentation and (3) withdrawal of conclusions (verification) (Aboe & Jusnita, 2022; Aliyyah et al., 2020; Asriansyah & Mahendra, 2020; Haryanto et al., 2022; Sugiyono, 2012; Utsman, 2017).

Research Results and Discussion

Based on data obtained from interviews, observations, and documentation of the learning process of land measurement techniques carried out in schools, the broad outline of the researchers describes the findings obtained in three sub-discussions namely learning planning, learning implementation, and learning assessment. According to Rusman (Rusman, 2017) In accordance with Graduates' Competency Standards and Standards content which are used as a reference for learning, Process standards are developed with the scope of planning the learning process, implementing the learning process, evaluating learning outcomes.

Learning Planning

The study of land survey conducted in vocational school refers to the decision of the Director-General of Primary and Secondary Education in 2017 to position these subjects in the C2 domain (Basic Skills Program) taught in class X semesters 1 and 2. However, the implementation in schools saw the competency to be taught in relation to the use of practical tools and psychological conditions of students, the subject of soil measurement techniques carried out in class X semester 2 and class XI semester 1. The teacher of soil measurement techniques looks at the need for students' readiness so that the lesson on land measurement techniques is carried out in class XI. The learning process in the education unit set out in article 19 paragraph 1 of Government Regulation No. 19 of 2005 states that learning is carried out in an informative manner in accordance with the physical and psychological development of students.

Learning planning in land surveying lessons here is more about providing an explanation of the work steps that must be carried out by students when they want to practice in the field. Work steps are given. The tasks that must be done are described earlier. In the practice of measuring land at this school it is divided into several parts, simple measurements starting from determining points in the field. Measuring with a roll meter, measuring distances blocked by buildings, arriving at measurements using tools such as height difference calculations, flat distance calculations to make a simple map. Make a small or medium area map to determine the height of a point. So in lessons at SMK the knowledge gained about how the work steps will be practiced and the skills of how students do practical work in the field. As for land surveying lessons at the school, the proportion of learning is 40% theory and 60% practice in accordance with core competencies and basic competencies, of course taking into account the availability of existing tools and the expected learning achievements in the lesson plan. become a consideration in learning planning, namely

the availability of existing tools and the accuracy of reading the tool.

It is important how students know how to work. so that before doing field practice the theory and measurement steps to be carried out are explained in advance in class in the form of video animation or power point to show the material to be displayed.

Learning planning undertaken by subject teachers is implemented with a Project-based learning implementation plan. Problems in a project that serve as learning methods are arranged in such a way that considers the basic competencies of the subjects. According to (Darmadi, 2017; Goman & Fedoreev, 2020; Hasanah & Astuti, 2021; Suryana & Hidayati, 2020) states that project-based learning is a learning method that uses problems as a first step in gathering and integrating new knowledge based on experience in real activities.

Project-based learning is designed to be used in complex problems that cause students to make investment activities and understand them. Projects carried out include calculating height differences, making maps of small and medium areas, determining the height of a point, measuring polygons, and measuring situation mapping using the polar method. Learning planning that will be carried out must also look at the environmental conditions that will be used as a place of practice, for example, to do the practice of calculating the high differences contained in basic competencies, the teacher must look at the contours of the land suitable for the practice.

Learning Implementation

Basically, the implementation of learning is to carry out what has been contained in the Learning Implementation Plan to students. As the design that has been developed during the planning is project-based learning, then the learning process is carried out based on job measurements which are relatively as representation to basic competency standards.

The basic competencies of competency exams consist of 20 basic competencies of 10 knowledge and 10 psychomotor competencies, based on that on every job given to students that contains performance criteria as a representation of basic competencies. As an example, in the job of making straight lines in the field in accordance with the basic competencies of applying (knowledge) and carrying out (psychomotor) principles of land measurement techniques, in this work students are also taught to determine points in the safe field so that measurements can be carried out properly in accordance with competence the basis of applying (knowledge) and implementing (psychomotor) occupational safety and health contained in basic competencies. Other examples of work given are measuring the polar method as in the basic competencies students are expected to be able to apply (knowledge) and carry out (psychomotor) measurements of flat and spacer devices.

According to the subject teacher interviewed the learning that was carried out was as much as possible according to what was needed by the industry so that the learning process emphasized knowledge and applicable skills. The application referred to here is how the knowledge obtained can be applied in the implementation of measurements in the process of building construction.

In each work carried out the students are equipped with a module that contains the steps of work, the purpose of carrying out measurements, tools used, and measurement data tables that will be filled out by students when making measurements.

In carrying out practical learning in the field, it is necessary to know the difficulties of students in operating measuring instruments, for example when measuring, sometimes it is difficult for students to see clearly because the field lens is blurry. Operation of the tool during practice is an important point of psychomotor skills that will be obtained from practical survey subjects, as a solution the subject teacher determines what measurement practice schedules will be carried out and provides job sheets such as a list of work steps carried out

so that during practice students take turns understanding work steps what to measure, how many points to shoot. According to the subject teacher at school, usually prior to practice there is a debriefing on what assignments will be carried out today, students are provided with a table of contents according to the type of measurement, so when measuring students only determine where the tool stands, arrange the tool used, and take a reading of the middle thread, upper thread as indicated on the tool. Tool operating skills are given during hands-on practice, but due to limited tools, students usually must take turns using the tool. In this survey, students were divided into several groups according to the available tools.

Learning Assessment of Surveying Techniques

Basically, the assessment conducted by the subject teacher is to find out whether students have mastered the specified competencies. According to Minister of Education and Culture Regulation No. 34 of 2018 the teacher/instructor conducts an assessment in accordance with the characteristics of the existing skills in the content and syllabus standards after the students can perform the skills without guidance. According to Kunandar The focus of assessment at the level of subjects lies in the competencies that must be achieved in the form of competency standards (SK) or Core Competencies (KI) which are further elaborated in Basic Competencies (KD) (Hastanti, 2022; Juarsa & Djuwita, 2020; Kunandar, 2013; Kurniati, 2022; Mawardi et al., 2019; Safitri & Oktaviana, 2017; Umami, 2018; Wagiran et al., 2019). In the 2013 curriculum, graduate competency standards include Knowledge, Attitudes and Skills.

Attitude is one of the competencies assessed by the subject teacher. Even though attitude is not taught in the teaching and learning process, attitude remains an indicator that is considered influential in the ability of students to receive lessons about geometer given. Attitude assessment is seen from how students can manage and organize their classmates in doing the work given by the teacher. The teacher conducts an attitude assessment by observation during practice in the field.

Another assessment conducted by teachers on subjects of land measurement techniques at 26 Jakarta vocational schools are the assessment of knowledge or cognitive competence. According to Kunandar (Kunandar, 2013; Vidergor, 2022) cognitive competency assessment is an assessment conducted by the teacher to measure the level of achievement or mastery of students in the aspects of knowledge that includes memory or memorization, understanding, application, analysis, synthesis, and evaluation.

The teacher of Surveying Techniques at the in Jakarta 26th vocational School explains the indicators applied to the assessment for cognitive aspects to find out the level of student understanding including by conducting written tests such as giving instructions to students to analyze the work steps performed on each measurement work that has been done, besides that students are also given the task to analyze data from the measurement results and students are given the task to draw conclusions from what has been learned. In addition to written tests, teachers also often conduct direct assessments with oral tests at the time the measurements are carried out. The oral test is usually carried out by holding questions and answers directly related to the basic competencies being practised.

As learning is carried out in the form of Project-Based Learning, Portfolio assessment is also an assessment instrument conducted by subject teachers. Fortopolio assessment in this case in the form of a report for each student that includes how students describe the steps of the work, calculation of measurement results, an explanation of the tools used and a drawing of the results of practice that has been done with a certain scale.

In addition to Cognitive and Attitude, Skills (Psychomotor) are also things that subject teachers cannot miss in assessing students. According to (Handayani & Marsudi, 2022; Rusman, 2017; Vovk et al., 2019) skills competency assessment is carried

out by educators through performance appraisal, which requires students to demonstrate a certain competency using practice tests, projects, and portfolio assessments. Subject teachers conduct assessments with indicators according to basic competencies i.e., students can carry out measurements, operate measurement tools and characterize other competency skills that have been set.

The assessment technique used is the performance evaluation at the time the job is carried out and at the end of the semester examination. as an indicator of teacher assessment usually see whether students have been able to do or demonstrate without help. In the performance evaluation aspects assessed by subject teachers are the quality of the implementation of measurements must be in accordance with the rules of work steps that have been set.

Another thing that becomes an assessment is how students can use measurement tools properly and correctly and the ability of students to adjust the tools to be used in measurements in accordance with existing job measurements. Another thing that becomes the criterion for assessing skills is how the students' ability to check measurement data. Scoring the student competency assessment is done with a scale. According to the subject teacher concerned, the grading scale given is very competitive if it gets a value of 91 and above, students are said to be competent if they get a score of 71 to 90, quite competent if the score obtained is 61 to 70, and not competent if the score is less than 60.

Assessment is carried out based on projects that have been carried out by students. According to Iriani and Ramdhan (2019) project assessment is an assessment activity on tasks that must be completed by students. Project appraisal focuses on project planning, execution, and product. in terms of studying soil surveying at SMK series of activities carried out in various types of measurements the assessment report is poured in with a written report related to the subject of land surveying techniques is a practical subject, so the basic competencies that are divided are knowledge about ways practice to be carried out. The indicators on knowledge in basic competencies are written as applying so how students are able to apply these competencies in the realm of knowledge and carry them out in the realm of skills or when practicing. Starting from principles, procedures, implementation, calculations and reporting. In the assessment process, an understanding of the actual distance is given, students must be able to rationalize what has been carried out and describe the conditions that occur when calculating the height difference, how to use the tool, how to determine the location point for the reading, how the students' vision differs in height when measuring, reading, measuring tools measurement report.

Conclusion

Based on the discussion of the results of research on the Implementation of Process Standards in the subjects of Surveying Techniques, it can be concluded that the implementation of the process standards in the learning of Surveying Techniques in Jakarta 26 Vocational High School went well by paying attention to the specified standards. Learning planning is done well by making lesson plans following existing Basic Competencies and considering the conditions of the learning environment and students. In the learning process Project Based Learning theory is used by subject teachers as a learning method that introduces students to the meaning of what is learned and the real work atmosphere after graduation. Learning by the Project-Based Learning method is carried out by considering the knowledge and skills that each learner will get later. The assessment is carried out by the subject teacher by considering the competency standards of graduates including cognitive, affective, and psychomotor with their respective assessment instruments based on the domain being assessed.

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