



The Ability of Students' in Using Length Measuring Instruments at State High School

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ABSTRACT

The purpose of this study was to determine the ability of students to use length measuring instruments at the State High School 7 Banda Aceh. This type of research was descriptive with a qualitative approach. The population in this study were all students of class X in State High School 7 Banda Aceh. The sampling technique in this study uses random sampling. The samples taken in this study were students from class X which totaled 5 classes, each class was taken 5 students who were randomly selected as samples. Data collection techniques by providing multiple choice tests of 10 questions and skills tests. Data collection techniques used were knowledge tests in the form of objective tests in the form of multiple choice and skills tests. The technique in data processing uses percentages to get the results of this study. Based on the results of the study it can be concluded that the ability of students' knowledge to use length measuring instruments by 60% and to use the calipers by 55%. While knowledge on screw micrometers by 72% and skills using screw micrometers by 63%. So it can be concluded that the grade X students of State High School 7 Banda Aceh had pretty good knowledge and skills in using calipers, while the knowledge and skills of students on the micrometer screw was good.

Keywords: basic length measuring instruments.

INTRODUCTION

Learning is an activity carried out by a person intentionally in a conscious state to obtain a concept, understanding, or new knowledge so as to enable someone to change behavior that is relatively fixed both in thinking, feeling, and in acting (Susanto, 2013: 4). Depdiknas (2002) states that learning difficulties can be caused by students' weaknesses in: mastering prerequisite knowledge, understanding concepts, operating mathematics, translating problems, planning problem solving strategies and using algorithms to solve problems. Learning in theory does not make students really know what they are good at. Some theories are also sometimes difficult for students to digest. Students need direct practice on the theory they have learned. Thus students will be more motivated in studying a theory, and indirectly students' curiosity also develops. Changes as a result of the learning process can be shown in various forms such as changes in knowledge, understanding, attitudes and behavior, skills, abilities and abilities, reaction power, acceptance and other aspects that exist in individuals (Sudjana, 2010).

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Physics is a branch of natural science, so physics is obtained from various events around us. Physics is obtained based on the process of investigation carried out by scientists for some time (Kurrotul, 2018: 2). According to Supiyanto (2006) "In conducting experiments we need measurements". According to Kanginan (2006) "Global changes that took place quite quickly put physics as one of the sciences which is the backbone of technology, especially manufacturing technology and modern technology. Modern technologies such as information technology, electronics, communication and transportation technology require a deep mastery of physics. Physics begins with observing nature".

The ability of students to explore and understand the learning material taught by the teacher is an important thing to achieve the objectives and maximum quality of learning. A learning activity will end in vain if students are unable to understand and master the subject matter being taught. Yusrizal (2016) "According to Bloom's taxonomy, the cognitive realm ranks thinking skills according to the expected goals. The thought process describes the stage of thinking that must be mastered by students in order to be able to apply theory into action ". Psychomotor domains are those related to skills or ability to act after a person has received certain learning experiences. Psychomotor learning outcomes that state that psychomotor learning outcomes appear in the form of skills (skills) and the ability to act individually, (Sudijono, 2011: 57-58).

Problem of Research

Problems in learning activities related to the low ability of understanding and mastery of the material taught by teachers occur in class X students of State High School 7 Banda Aceh. The students were less able to master the material taught by teachers, especially in physics. Students were also less skilled in using laboratory equipment, one of which was length measurement. Learning difficulties was a condition that causes obstacles in one's learning process (Hakim, 2008: 22). One problem that still occurs in schools was that teachers have not involved students in conducting experiments so there was no evaluation of the results of lab experiment's reports. Even though the experimentss can develop students' thinking processes and provide students' learning experiences and develop basic skills in real student work.

Research Focus

This research was conducted to see how students' abilities in using length measuring instruments. For this reason, researchers want to conduct research under the title "Students' Ability in Using Length Measuring Instruments at State High School 7 Banda Aceh".

METHODOLOGY OF RESEARCH

General Background of Research

The type of approach used in this research was descriptive with a qualitative approach. In writing qualitative research results contain excerpts of data (facts) revealed in the field to provide support for what was presented in the report (Anggito & Setiawan, 2018: 11).

Sample of Research

The population of this study were all students of class X MIPA State High School 7 Banda Aceh. The population consists of a group of objects that are the center of attention, from which contained information that wants to know (Gulo, 2002: 76). The sample technique used in this study was the Simple Random Sampling method. Simple Random Sampling is a technique for getting samples that are directly carried out on the sampling unit. It is said simple because sampling and members of the population are carried out randomly without regard to strata in the population. This method is used when members of the population are considered homogeneous (Sugiyono, 2012: 120). The sample in this study was taken from students from class X which totals 5 classes, each class was taken 5 students who were randomly selected as samples.

Instrument and Procedures

Data collection techniques used in the form of tests. The test is a tool or procedure used to find out or measure something in an atmosphere, by means and rules that have been determined (Arikunto, 2009: 53). Knowledge tests are objective tests in the form of multiple choice and skills tests. This test is said to be objective because students are not required to compose answers to the information they have as in the essay test. In this test, answers have generally been provided or have been directed and are more certain (Sukardi, 2011: 107).

Data Analysis

Data collection techniques are the most important step in research, data that has been obtained through tests are then processed using percentages to get the results of this study. The results of the data can be analyzed with the following guidelines:

Achievement Percentage Criteria Table

Percentage	Achievement Categories
> 80%	Very capable
66% - 79%	Capable
56% - 65%	Pretty Good
40% - 55%	Poor of Capable
0% - 39%	Very Poor of Capable

(Daryanto, 2010: 211)

RESULTS OF RESEARCH

On the results of the knowledge test about the calipers with indicators determining the accuracy of the calipers, 82% of students knew while 18% of students did not. Based on observations of skills in using calipers obtained as much as 47% of students could calibrated and checked the accuracy. While as many as 33% of students were not right in doing calibration or checking the accuracy of the calipers. The remaining 20% of students could not calibrated and did not checked the accuracy of the calipers. This shows that the results of students' knowledge about the accuracy of the calipers was very good, but in terms of student skills to calibrated and checked the accuracy of the calipers was considered quite good.

Knowledge test results show that 44% of students knew the use of calipers. While the remaining 56% of students did not knew. Based on the skills test as much as 67% of students could placed objects that were measured correctly. While as many as 33% of students were not quite right in placing the object being measured. This was explained that the results of students' knowledge about the use of calipers was quite good. Whereas students' skill in placing objects measured by calipers was considered good.

The results of the knowledge test about reading the calipers scale were 50% of knowing and 50% for not knowing. After the skills test was known, as many as 47% of students could read the main scale, as much as 67% of students could read the nonius scale and as much as 40% of students could took the measurement of calipers. This explains that the students' knowledge in reading the calipers scale was quite good. Whereas the students' skills in reading the main scale, reading the nonius scale, and doing the calipers measurement results were quite good.

On the results of the screw micrometer knowledge test, obtained as much as 96% of students knew the accuracy of the screw micrometer, while as many as 4% of students did not. Skill test results obtained as much as 47% could calibrated and checked the accuracy of the screw micrometer. While as many as 33% of students were less precise in calibrating or checking the accuracy of the screw micrometer, and as many as 20% of students could not calibrated and could not checked the accuracy of the screw micrometer. These results indicate students' knowledge of the accuracy of the screw micrometer was very good, while the results of the students' skills to calibrated and checked the accuracy of the screw micrometer was quite good.

In the test results knowledge that as much as 50% of students knew how to read the screw micrometer scale and as many as 50% of students did not. While the test results obtained by skills as much as 67% of students could placed the object measured on the screw micrometer correctly, as many as 73% of students could read the main scale, as much as 60% of students could read the nonius scale and as much as 60% of students could made the results of the screw micrometer measurement with correct. This shows that the results of students' knowledge of the reading of the screw micrometer scale was quite good, but in terms of skills students could placed the object measured on the screw micrometer correctly,

could read the main scale, could read nonius scale and could do the measurement of the micrometer screw was considered good.

This was in accordance with previous research Indra Sakti (2011), The results obtained that the knowledge of physics experiments tools students of State High School 2 Bengkulu City in the 2009/2010 academic year was good (52.20%), students' psychomotor abilities were very good (73.91%). The correlation coefficient was 0.747, thus there was a positive and significant correlation between the knowledge of Physics experiments tools and students' psychomotor abilities. Based on the results of previous studies, Ade Irma Novianti (2015) that the psychomotor ability of students in the measurement material has a 90-100% completeness. With this experiments activity could gave students to have the opportunity to be able to develop psychomotor abilities in learning, so that by mastering the optimal process could help students in developing the concepts of physics they were learning. Based on Friska Octavia Rosa's research (2015) that the average cognitive and affective abilities of students are quite good while the average psychomotor ability was skilled. From various indicators such as solving optical material questions, solving calculation problems and solving C4-C6 stage questions, female students have better average abilities than male students. Then there was a correlation between affective abilities and cognitive abilities by 70%, and there was a correlation between affective abilities and psychomotor abilities by 43.5%. Based on the results of research by Rofi Wibowo (2013) using calipers, 61.5% of skilled students were found and the rest were not. Using a micrometer found 47.8% of skilled students and the rest not.

In the learning process, students not only learn theory but must also done a practical work, this was in accordance with previous research. Prasetyarini (2013) learning by using teaching aids was a series of activities to convey subject matter aimed at giving students opportunities to actively learn, thus enabling students gained knowledge and develop psychomotor skills and foster student creativity to solved problems faced such as asking questions that were not yet understood. The results of this study indicate that through the use of natural science aids could improve students' understanding of physics concepts. This was marked by an increase in students' understanding of physics concepts in each cycle.

CONCLUSIONS

Based on the results of the study it could be concluded that the ability of students to used measuring instruments at 60% calipers knowledge and 55% calipers skills. While the micrometer screw knowledge was 72% and the skill of the screw micrometer was 63%. So it could be concluded that the class X students of State High School 7 Banda Aceh that the knowledge and skills in the calipers of students was quite good, while the knowledge and skills of students on the micrometer screw was good.

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