

APPLICATION OF EXPERIMENTAL METHODS TO IMPROVE LEARNING OUTCOMES CLASS V STUDENTS ON SCIENCE LEARNING ABOUT LIGHT PROPERTIES

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ABSTRACT

Natural Sciences includes basic natural science that has a lot to do with life and life in this world. That is the background of this research. Learning Natural Sciences has been given since students in elementary school. It is very important for students to understand the process of forming elements of life in the surrounding environment. The results of learning Natural Sciences in the fifth grade students of SDN 001 Merdeka were still relatively low. In addition, the learning process so far allegedly runs monotonically and can make students feel bored easily, so the classroom atmosphere is no longer conducive to the learning process. Seeing this fact, researchers conducted classroom action research by applying experimental methods to the learning process in the classroom. With the experimental method it is expected that students will feel interested in learning new things, including fostering curiosity in students about the characteristics of the light they encounter daily. The learning outcomes are also expected to improve better, considering that in the experimental method students can directly gain experience and knowledge directly. The results of this study can also be used as reference material for teachers to conduct further research or similar research.

Keywords: Experiments, Learning Outcomes, Properties of Light.

INTRODUCTION

Education is all life situations that affect the growth of each individual as a learning experience that takes place in all environments and throughout life. In a narrow sense education is teaching that is held generally in schools as formal education institutions. Education must be a learning experience for each individual since primary school age. Learning experiences can be given every day, and take place in formal or non-formal educational institutions. Learning experience can be obtained through the teaching and learning process, both in the classroom and outside the classroom. In essence, teaching and learning activities are a process of interaction or reciprocal relationship between the teacher and students in the unit of learning. Improving the quality of education is one of the efforts that must be done intensively. One of the efforts made to improve the quality of education is to carry out various learning innovations (Suagia and Wiratma, 2008). In this regard, of course, the teacher must determine and seek a teaching system to be more meaningful and efficient. In the teaching and learning process teachers are expected to be able to choose effective and varied learning models. The choice of the learning model is very dependent on the purpose of teaching, the material being taught, the

competence of students, as well as available facilities and infrastructure, other requirements that must be considered are that the teacher must know and master the learning model itself, the objectives to be achieved in the learning are adjusted to the material / the purpose and scope (Engkoswara, 1998 in Sakdiyah, 2010). Natural Sciences (IPA) deals with how to find out about nature. Natural Science is a translation of words in English, namely natural science, which means natural science (IPA). Because it deals with nature and science means it is science, being natural science (IPA) or science that can be called natural science. The science that studies the events that occur in this nature (Usman Samatowa, 2010). In principle, studying science as a way of finding out and how to do or do and help students to understand the natural surroundings more deeply (Depdiknas in Suyitno, 2002). The National Education Standards Agency (BSNP) states that learning science in elementary schools must be carried out in scientific inquiry (scientific inquiry), this is intended to foster the ability to work scientifically, be scientific and can communicate it as an important component in life skills. Sarjono (2000) in his research cited by Witarsa (2011) states that learning science in elementary schools has been carried out not through scientific inquiry but dominated by information transfer activities and memorization, so that the results of learning science in elementary school become low and have no long meaning. The low learning outcomes of science, especially in the fifth grade of SDN 001 Merdeka, Bandung, are caused by several factors, including teacher factors and student factors that are interrelated. Teachers tend to be monotonous in delivering material, so students tend to be bored and bored in participating in learning. So that learning objectives are not fully achieved. Seeing this tendency, the writer tries to do an action research. This research is an effort to improve the learning outcomes of fifth grade students of SDN 001 Merdeka Kota Bandung in natural science learning about the properties of light. In general, students learn by memorizing science concepts instead of learning to understand and understand the concepts of science. Problems like this are real. The fifth grade students of SDN 001 Merdeka, Bandung City who were able to achieve mastery learning were only 20%, the remaining 80% of the total number of fifth grade students had not yet reached the KKM.

Thinking Framework

In an effort to improve student learning outcomes, teachers must be able to create an active and enjoyable learning atmosphere. One form of these efforts the teacher can apply learning methods that can involve students directly so that they will get the learning experience by themselves. The experimental method is a learning method which involves students directly

in conducting experiments. With this experimental method, student learning outcomes can increase. For this reason, the researcher made the following research framework:

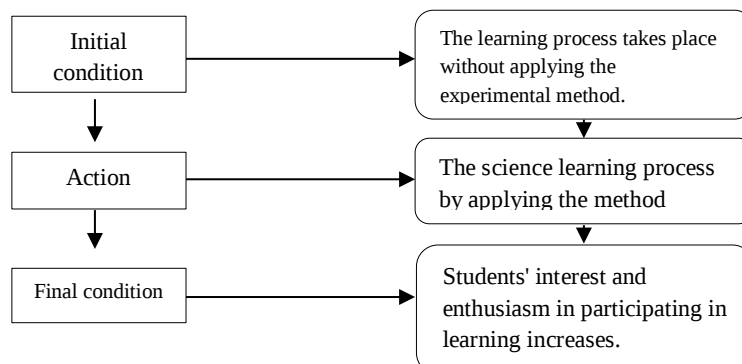


Figure 1. Thinking Framework

Experimental Method

Experiments are interpreted as learning to do, therefore can be classified into learning methods. Experiments or experiments are parts that can be said to be difficult to separate from Natural Sciences in general. Experiments or experiments can be done in class, in the laboratory, or in the open. This experimental method has an important meaning, because in addition to providing practical experience that can be a stimulus for students to foster enthusiasm in learning, this method also involves student activities directly, so that the learning experience is truly created. According to Djamarah and Zain (2006) the experimental method is a way of presenting lessons in which students experiment with experiencing and proving themselves something learned. Syaiful Sagala (2005) argues that the experimental method is a way of teaching, where students conduct an experiment about a matter, observe the process and write the results of the experiment, then the results of the observation are delivered to the class and evaluated by the teacher. According to Sumantri (1999) the experimental or experimental method is a demand from the development of science and technology in order to produce a product that can be enjoyed by society safely and in learning involves students by experiencing and proving their own processes and results of the experiment. Based on some of these opinions it can be concluded that the experiment or experiment is a learning method that is very appropriate to be used in the science learning process because in the experimental process learning involves students' activities directly so that they can experience and experience everything related to the process of finding concepts or theories as provision in dealing with various problems in life in the future.

Learning Outcomes

Throughout human life can not be separated from learning activities, whether consciously or not. Through learning activities, humans gain new knowledge and experience even though it does require a process that is not short. The main purpose of learning activities is learning outcomes. Dimiyati and Mujiono (2002) state that learning outcomes are the result of a teaching or interaction action. Nashar (2004) argues that learning outcomes are abilities acquired by students after learning activities. While Nasution (2006) argued that learning outcomes are a change in individual students after experiencing the learning process, not only about knowledge but also requires skills, habits, understanding, appreciation, attitude, self-mastery in the individual individual who learns. Hamalik (2004) suggests that learning outcomes are patterns of action, values, knowledge-knowledge, attitudes, appreciation, ability, and skills. Hamalik then defines learning outcomes as the level of mastery achieved by students in following the teaching and learning process in accordance with the stated educational goals. Referring to the opinions above, the researcher concludes that learning outcomes can be interpreted as an output from various interactions that occur as long as the learner or student follows the learning process which includes changes in character, attitude, knowledge, and skills.

Science Learning In Basic School

Natural Sciences (IPA) subjects are one of the subjects taught at all levels of education, including elementary school. According to Iskandar (1997) the IPA stands for the words "Natural Science" is a translation of English words "natural science" briefly called "science". Natural means natural, related to nature or related to nature. Science means science. So Natural Science (IPA) or science can literally be called the science of nature, the science that studies the events that occur in nature. Slightly different from other opinions, Abdullah (1998) suggests that science is a theoretical knowledge that is obtained or arranged in a special or special way, namely by observing, experimentation, conclusion, theoretical compilation, experimentation, observation and so on and connecting the ways one in another way. Connor (in Cartono-Yusuf, 2010) concludes that science education for elementary schools must be consistently oriented to: (a) developing process skills, (b) developing concepts, (c) applications, (d) social issues based on science From some of the views above, it can be concluded that IPA is a collection of concepts or knowledge about nature which tends to emphasize the provision of information so that students master these concepts through digging and experiment activities.

METHOD

The research that will be conducted is a type of action research. The term class action research comes from the phrase action research in English. The research conducted in the classroom was analyzed by classroom action research (Nurkamto in Sukidin et al., 2010). Classroom action research (CAR) is a form of research carried out by teachers to solve problems encountered in carrying out their main tasks, namely managing the implementation of teaching and learning activities in a broad sense (Purwadi, 1999 in Paizaluddin and Emalinda, 2013). According to Arikunto (2008) Classroom Action Research (CAR) is a scrutiny of learning activities as an action, which is deliberately raised and occurs in a class together. The type of CAR chosen is Participant CAR. A study said as a participant CAR is if the person who will carry out the research must be directly involved in the research process from the beginning to the results of the research in the form of reports. Thus, since the research date researchers are always involved, then the researchers monitor, record, and collect data, then analyze the data and end up reporting their research results. Here researchers are required to engage directly and continuously from the beginning until the end of the study.

RESULTS AND DISCUSSION

Results

The learning conditions in this pre-cycle session are the initial conditions or conditions before the classroom action research is carried out with the application of experimental learning methods. The overall classroom situation, whether student activity or student learning outcomes, all takes place and is obtained from learning without experimental methods. Of the total 36 students in grade V, only 10 students were declared capable of achieving mastery learning. Researchers who also act as teachers in this class action research are very important in order to realize the research objectives. After analyzing the results of observations made by colleagues as observers, the learning process in the second cycle of the second meeting and the second meeting was better than the implementation of learning in the cycle session 1. The teacher was more concentrated and careful in managing learning, so Learning steps can also be more organized and well controlled. The deficiencies that occur in cycle 1 session no longer occur in cycle 2, although it is not completely perfect, but in general the management of learning during the cycle 2 learning process is much better. Students' activities during the learning process in the second cycle session, either the 1st meeting or the 2nd meeting, seemed better when compared to their activities in the cycle session 1. When the teacher started

learning, all students had shown their readiness to attend the learning process. Student activities in paying attention to the teacher's explanation of the subject matter are better and more conducive. The experimental process assigned to students in groups was followed enthusiastically. All are involved in the trial process with prepared props. Group discussions or presentations went well. Students are more confident in expressing their opinions or answering questions. In working on evaluation questions they were more confident and confident, there were no more students who cheated on their friends' answers, although there were still some people who had not been able to absorb the subject matter and still looked confused when working on the questions. In general, the learning process in the second cycle session is better than before, so researchers and observers agree to end the research in cycle 2. Below the researchers present the tables of the results of observations made in the pre-cycle learning process, cycle 1, and cycle 2.

Table 1. Frequency of Pre-Cycle Learning Extinction

Learning Session	Grade	Fr.	C/Nf.	%
Pre cycle	≥ 75	10	Complete	28
	≤ 75	26	Not finished yet	72
Amount		36		100

Table 2. Frequency of Completeness of Learning Cycle 1

Cycle 1	Median	C	Nf.	%
1st meeting	75	22	14	61,11
2nd meeting	78	29	7	80,56

Table 3. Frequency of Completeness of Learning Cycle 2

Cycle 2	Median	C	Nf.	%
1st meeting	80	31	5	86,11
2nd meeting	85	34	2	94,44

Discussion

By reading the tables above it can be stated that the completeness of student learning in science learning before the implementation of the research action is still far below 50%. Of the total 36 students who were able to achieve mastery learning before the implementation of the experimental method in science learning in class V SDN 001 Merdeka Bandung only 10 people

or 28% had been able to achieve mastery learning. The rest is still far below the stipulated KKM which is 75. This situation is different from what happened in cycle 1 when science learning uses experimental methods. In table 4.18 it can be seen that the average value obtained by students has increased. At the 1st meeting, the average score of students reached 75 and the completeness of learning was 22 people or 61.11% of the total. Then the increase occurred again at the 2nd meeting, the average value of students became 78 with the completeness frequency of 29 people or 80.56% of the number of students in class V. Stepping on cycle 2 learning, increasing learning completeness and the average value of students even better. As seen in table 4.19 that the frequency of students who are able to achieve mastery learning in the second cycle of the 1st meeting increases compared to the second meeting of cycle 1. As many as 31 people or 86.11% at the 1st meeting of cycle 2 have been able to achieve mastery learning with an average value of 80. Then there was an increase in the second meeting of cycle 2. The average value of students reached 85 with a passing frequency of 34 students or 94.44% of the number of students. Only 2 people left or 5.56% who have not been able to achieve mastery learning.

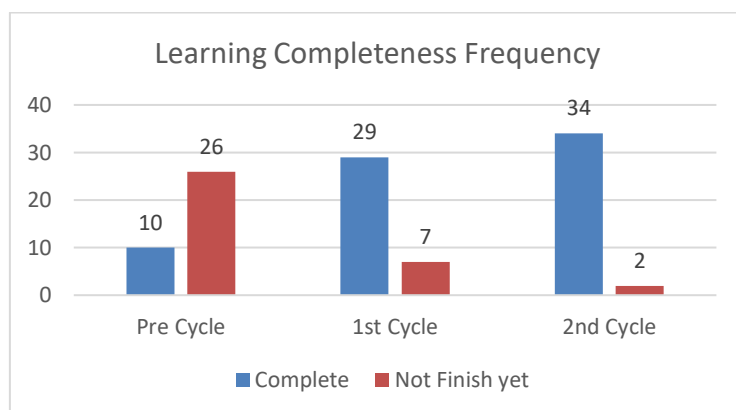


Figure 2. Diagram of the Frequency of Complete Cycle Learning

So it can be explained that the frequency of completeness of learning in each cycle has a very significant increase. This proves that science learning by applying experimental methods with several advantages has been proven to be able to improve student learning outcomes. In addition to increasing learning completeness, it can also be stated that the quality improvement of teacher and student activities during the learning process from cycle 1 and cycle 2 of each meeting. This can be seen from the following table:

Table 4. Improving the Quality of Activities of Teachers and Students in Each Cycle

No	Activity	Cycle 1		Cycle 2	
		1st meet	2nd meet	1st meet	2nd meet
1	Teacher's Activity	Enough	Enough	Enough	Decent
	Score	55	66	68	79
2	Student Activity	Deficient	Deficient	Enough	Decent
	Score	39	47	56	63

Based on the table above it can be explained that the activity of teachers and students during the learning process in each cycle continues to increase. This phenomenon certainly cannot be separated from efforts to improve learning management on the basis of observers' observations, so that the learning process takes place very conductively.

Thus, it was answered the research hypothesis written in Chapter 1 earlier that with the application of the experimental method in natural science learning about the properties of light, the learning outcomes of the fifth grade students of SDN 001 Merdeka in Bandung could increase.

CONCLUSION

Based on the results of observations and analysis of the results of the study on the learning process of cycle 2 in which the agreement between the researcher and the observer was decided as the last cycle of this study, it can be concluded that (1) the interest and enthusiasm of the fifth grade students of SDN 001 Merdeka Bandung in following science learning after the implementation of the experimental method experienced significant changes. Visible student activity during the learning process in cycle 2 is 63 which is converted into qualitative values with good categories; (2) The experimental method applied during science learning in class V SDN 001 Merdeka Bandung has succeeded in improving student learning outcomes, as evidenced by the average value obtained by students at the end of cycle 2 to 85 with the percentage of learning completeness reaching 94.44%.

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