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RESEARCH ARTICLE

Enhancement of Physical Learning Results in Subject Matter of Dynamic Electricity through Problem Based Learning Methods on IX-B Grade Students at SMPN 3 Surabaya

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ABSTRACT

Physics learning in teaching and learning activities are known not doing interaction between students and their teachers, causing learning outcomes to be not maximal. This research aims to enhancement of physical learning results of dynamic electrical materials through problem based learning methods on IX B grade students at SMPN 3 Surabaya. The design of this research is Classroom Action Research which is carried out in two cycles with 4 stages which are planning, action, observation and reflection. The first and second cycles discuss the subject matter of dynamic electricity. The subject of this research is 38 students of IX B grade students at SMPN 3 Surabaya. The main of data collection technique used tests and observations, while supporting techniques used documentation. The results of the research show that there was an increase from cycle 1 to cycle 2. The average value of student learning outcomes in cycle 1 reached 73.42 and in cycle 2 it increased to 86.57. The classical completeness percentage of student learning outcomes in the first cycle reached 65.79% and in the second cycle increased 21.05% to 86.84%.Based on the results of the above research, it can be concluded that there is an increase in student learning outcomes after the application of the problem based learning model on subject matter of dynamic electricity on IX B grade students of SMPN 3 Surabaya, so problem based learning models can be used as alternative learning models in an effort to improve outcomes good learning.

1. INTRODUCTION

Physics is one branch of science that studies natural phenomena, especially the relationship between matter and energy (Kanginan, 2007). The global changes that took place quite quickly put physics as one of the sciences which is the backbone and has a very important role in the field of technology, especially modern technologies such as information, communication and transportation technology that require a profound mastery of physics (Lutpiah, 2014). In the process of learning physics emphasizes on direct experience to develop student competencies so that students can better understand the surrounding environment scientifically.

Physics learning has been almost fully taught by using lecture methods that are centered on teachers and students only focus on what is conveyed by the teacher so that students' critical and creative thinking activities in obtaining information have not been implemented well (Muyassaroh, 2013). Physics learning must be adapted to the characteristics of science, must actively involve students to conduct investigations. Engaging students actively in the process of scientific inquiry during learning is a basic requirement in learning Physics. The expectation that learning Physics is able to instill and cultivate critical, creative and independent scientific thinking and behaving habits has an impact on the teacher's role which shifts from the conveyor of knowledge which focuses more on student activities. Students must be actively involved in solving problems to find solutions. Getting students active in solving problems is capital for students to have competencies which in turn can solve problems in daily life, be more independent in following the next level of education and independent in work (Hinduan, 2007).

The learning material in this study is dynamic electricity. Dynamic electricity is a subject matter of electricity that is found in everyday life, but in reality students are still having difficulties because it is considered material that has a high complexity so students often have difficulty understanding it and even many misconceptions (Muyassaroh, 2013). Based on observations made by researchers, the physics learning process is still going on conventionally. This is known from the learning method that is still teacher-centered and student participation in learning is classified as passive. In addition, these results are also supported by physics learning outcomes of IX B grade students from 38 students are known that 47.4% had scores below the Minimum Completion Criteria 80.

Learning outcomes are the most important part of learning. Student learning outcomes depend not only on the students' learning abilities, but also depend on the ability to teach the teacher. The teacher plays an important role as a learning designer by carrying out activities in the form of giving several methods or supporting media that are able to attract students' interest in

learning. This is done so that the achievement of learning can succeed optimally. In principle learning is doing, there is no learning if there is no activity. That is why activity is a very important principle in teaching and learning interactions (Sardiman, 2010).

One of the right learning approaches to be applied is Problem Based Learning (PBL). PBL is one of the learning models recommended in the implementation of the 2013 curriculum because this model is proven to be able to stimulate high-level thinking skills by designing problems in real contexts. PBL is more oriented towards students in developing critical thinking patterns. In its curriculum, besides getting knowledge, students are also required to be proficient in solving problems, able to have their own learning strategies and work with teams. In this study, the researchers aim to enhancement of physical learning results of dynamic electrical materials through problem based learning methods on IX B grade students at SMPN 3 Surabaya.

2. METHODS

This research is Classroom Action Research using qualitative descriptive method. Qualitative descriptive research is research that describes the state of the object of research at the present time as it is based on facts. This research is an attempt to reveal a problem or situation or event as it is so that it is only a revealer of facts. The results of the study are emphasized to provide an objective description of the actual state of the object under study (Moleong, 2008).

The research was carried out at SMPN 3 Surabaya in September 2018. The subject of this research is 38 students of IX B grade students. The research was conducted in 2 cycles with each cycle through 4 stages, which are planning, action, observation, and reflection. At the planning stage, researchers prepare lesson plans, prepare materials and learning media, prepare research instruments. At the action stage, researchers carry out learning in accordance with the RPP and doing observation together. At the reflection stage, the researcher conducts an evaluation and conclusions from the results of the implementation of the action. These four stages are always continuous and experience improvements in the process.

Retrieval of data in this study using research instruments in the form of observation sheets and illustrative cases. The data obtained in this study are (1) primary data, in the form of observation sheets and student test results per cycle; (2) secondary data, in the form of student value data before any action is taken; and (3) supporting data in the form of documentation. Finally, data analysis is carried out in accordance with the construction of the discussion of the research results.

3. RESULTS AND DISCUSSION

A. Initial Condition

Of the 38 students it was found that there were 47.4% or as many as 18 students had learning outcomes that had not yet reached KKM. This means that only 20 students have a value of ≥80.

To find out the improvement in student learning outcomes, researchers will conduct an assessment of learning outcomes through tests held at the end of each cycle. There are two assessments carried out, namely:

1) Individual completeness, which is an assessment seen from each individual. Formulated as follows:

$$\textbf{Value} = \frac{\textit{total score correct answer}}{\textit{score te wole question}} x100$$

If the student's score reaches ≥80 according to the minimum completeness criteria, then the student is said to be complete.

2) Classical completeness, which is an assessment seen from the number of students in a class. Formulated as follows:

$$k = \frac{\textit{total students wo get } \geq 80}{\textit{total of all students}} x100\%$$

Description: κ is a minimum percentage of classical completeness

Criteria for success rate: > 80% = Very high
60-79% = High
40-59% = Medium
20-39% = Low
<20% = Very Low

B. Cycle 1 Results

In test 1 the teacher gives evaluation questions in the form of 10 multiple choice questions. The question is done by 38 students in 40 minutes. The following are the results of material completeness based on test results 1.

Table 1 Results of Material Completion Based on Test Score 1

Value of Test 1		Frequency	∑Frequency	Percentage (%)	∑Percentage (%)
Uncomplete Students	50	3	13	7.9	34.2
	60	4		10.5	
	70	6		15.8	
Complete Students	80	14	25	36.8	65.8
	90	8		21.1	
	100	3		7.9	
Total			38		100.0
Average Class Value			73.42		
Classical Completeness Score			65.79 % (High)		

Based on Table 1, it can be informed that most (65.8%) students have been said to be complete because they have a value of ≥80. The value of classical completeness is only 65.79%. This value includes a high success rate but this has not yet reached the KKM value (≥80%) so that it can be said that the Problem Based Learning (PBL) learning method in cycle 1 is less successful.

C. Cycle 2 Results

In test 2 the teacher gives evaluation questions in the form of 10 multiple choice questions. The question is done by 38 students in 40 minutes. The question given is different from test 1, but the types of questions are still similar. The following are the results of material completeness based on test results 1.

Table 2 Results of Material Completion Based on Test Value 2

Value of Test 2		Frequency	∑Frequency	Percentage (%)	∑Percentage (%)
Uncomplete Students	50	0	5	0	13.2
	60	2		5.3	
	70	3		7.9	
Complete Students	80	9	33	23.7	86.8
	90	14		36.8	
	100	10		26.3	
Total			38		100.0
Average Class Value			86.57		
Classical Completeness Score			86.84 % (High)		

Based on Table 2, it can be informed that almost all (84.2%) students have been said to be complete because they have a value of ≥80. The classical completeness value is 84.21% and has reached the KKM value so that the Problem Based Learning (PBL) learning method in cycle 2 has been successful.

D. Discussion

Based on the results above, it seems clear that the occurrence of an increase in results before and after the action was carried out using the Problem Based Learning (PBL) approach. The initial conditions before action is taken towards cycle 1 there is an increase of 18.4% and from cycle 1 to cycle 2 also increases by 21%. With this increase, it shows that there is an increase in student learning outcomes of class IX B. Based on the description above, the increase in results in students of class IX B occurs in cycle 2. This is due to additional actions from the teacher that stimulates student motivation to learn. In this case, some of the actions taken by the teacher are as follows: (1) reduction in value when students are busy, doing or talking about other things outside of learning, (2)

before learning begins students have gathered with groups so that there is maximizing time, (3) with the head of the group can help the teacher to organize group discussions, (4) the teacher is more active in paying attention to student activities, (5) giving additional values when there are students who dare to ask and (6) giving awards to groups who dare to present before the class correctly.

4. CONCLUSION

Based on the results of the study it can be concluded that the application of Problem Based Learning (PBL) learning methods in class IX B succeeded in achieving indicators of success, but only in cycle 2. In addition, learning methods Problem Based Learning (PBL) can improve student learning outcomes.

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