Improving Physical Learning Results through the Problem Posing Method in State 4 Pekanbaru High School

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Abstract: This research is based on still many students who have not reached the complete criteria for rigid body equilibrium material. Efforts to improve learning outcomes, an effective method is needed so that students are serious and try to solve problems in the learning process. The problem-posing method is a step to improve the results of teaching and learning activities. For this reason, the research aims to find out whether or not there is an influence of the problem-posing method on students' learning and activity in learning physics. This research was carried out in 2 cycles from January to April 2016. The subjects of this study were students of class XI IPA 4 of SMA Negeri 4 Pekanbaru totaling 38 people. Research data was obtained through observation and evaluation tests. The results of the analysis showed that the learning activity of students in cycle II showed an increase compared to cycle I. Increasing activeness in asking was 54.8%, the ability to make questions 66.9%, the ability to solve problems made 63.7%, the ability to solve problems made by his friend 66.9%, and the ability to convey ideas 55.6%. The average class of each cycle also increased, in the first cycle was 82.1 and the second cycle was 86.74. Classical learning completeness in cycle I is 76.3% and cycle II increases to 92.1%. The results of the research analysis show that the problem posing method of learning is more preferred by students so that it can improve learning for students.

Keywords:Increased Learning Outcomes, Problem Posing

1. Introduction

Improving the quality of physics education is something that is very strategic in improving the quality of human resources, so as to have knowledge, skills, and attitude oriented towards increasing mastery of science and technology. Improving the quality of education needs to make improvements such as a curriculum that can provide basic skills and minimal skills in the application of strategic learning approaches, models that can generate active, creative, and independent attitudes that are in line with current and future learning needs. A very urgent improvement is to change the learning of passive learning students to active learning. Active learning must be created by the teacher by designing learning that challenges students to actively participate, engage in discussion and explanation of ideas, create and solve problems collaboratively to arrive at understanding the material being studied.

In connection with learning physics, which is basically a concept learning, the important thing is how students can understand these concepts. The basic concepts of physics are a unified and unified entity, so learning physics is required to be more skilled and creative in responding to problems. The fact that in physics teaching many students have not been able to apply the concept of physics. This can be seen from the many errors of students in working on questions

in daily tests, semester tests and National Final Exams. Whereas in the implementation of the teaching and learning process in class usually the teacher gives a continuous task (stabilization) in the form of practice questions. But in the implementation of training it cannot fully improve students' ability to apply the concept of physics. (Pelangi Pendidikan, 2002).

One of the causes of students not being able to apply the concept of physics is that they have not been able to work on questions that are slightly different from examples of teacher-made problems. Even though the questions that the teacher made during the daily and semester tests were similar (slightly different) with examples of the questions the teacher made during the learning process. Students should be able to apply the physics concepts that have been learned to solve teacher-made problems. Therefore students need to have varied experience in making problems and solving them. (PelangiPendidikan, 2002).

Another cause is that teachers have not been able to create an atmosphere of learning that is interesting and fun so students are less motivated and feel burdened in learning physics. Therefore, in physics learning teachers need to use appropriate and interesting methods so that students are more motivated in learning physics. Methods of submitting questions or problem-posing or making their own questions can help students develop their preferences for physics, because students' physics ideas are directed to understand the problem being worked on and can improve their understanding in solving a problem.

SMA Negeri 4 Pekanbaru in the peaceful marpoyan sub-district and has 28 classes. In the teaching and learning process, SMA Negeri 4 Pekanbaru establishes a Minimum Completeness Criteria (KKM) which is quite high for the Physics subject for class XI Science in the 2015/2016 academic year, which is 82.

Based on the results of observations and interviews with some students of class XI IPA 2015/2016 and 2014/2015, they expressed difficulties in learning physics because the concepts were difficult to understand. According to class XI 2014/2015 academic year one of the topics considered difficult in the even semester of class XI Science is the rigidity of rigid objects because there is a lot of material to count and requires practical ways to understand the concept. Physics teacher class XI IPA stated the same thing where the rigid equilibrium material was still considered difficult. This is evident from student learning outcomes that are still low. Data on the average value of physical replication on rigid body balance material for the 2014/2015 school year is 53.68. There are still many students who have not reached the full criteria on rigid body equilibrium material. Of these problems, researchers suspect that to improve student learning outcomes an effective method is needed so that students learn the material seriously, want to ask questions when the learning process takes place, not rely on others and work together in solving problems in the learning process (Yennita, et al, 2018).

One learning that gives students the opportunity to make questions and do them is the problem posing method. This method seeks to motivate students to think critically as well as dialogically, creatively, and interactively namely problem posing or the submission of problems as outlined in the form of these questions and then sought to find answers both individually and in groups. In accordance with the use of this problem posing method, the purpose of this study is to reveal the presence or absence of the influence of problem-posing methods on students' learning knowledge and activeness.

According to Trianto (2009), learning is essentially a process that is characterized by changes in a person. Changes as a result of the learning process can be indicated in various forms such as

changing knowledge, understanding, appreciation, skills, habits, attitudes, and behavior, skills, and abilities, as well as changes in other aspects that exist in the individual who is learning.

Gagne (in Suprijono, 2009) suggests learning is a change in disposition or ability that a person achieves through activity. The change in disposition is not obtained directly from a person's natural growth process. Meanwhile, according to Reber (in Suprijono, 2009), learning is the process of gaining knowledge. In addition, Slameto (2010), said that learning is a business process that is carried out by a person to obtain a new behavior change as a whole, as a result of his own experience in interaction with his environment.

In the teaching and learning process, teachers as instructors and educators also play a large role and responsibility in order to help improve student success. The success of students in the teaching and learning process is influenced by the quality of teaching and internal factors of the students themselves. The teaching and learning process is carried out with the intention to make changes in students. This change can be seen from the final results obtained by students. This final result is identified with learning outcomes.

Rusman (2013) suggests learning outcomes are a number of experiences gained by students that cover cognitive, affective, and psychomotor domains. According to Suprijono (2009), suggests that learning outcomes are patterns of deeds, values, understanding, attitudes, appreciation and skills. According to Purwanto (2011), learning outcomes are changes in behavior that occur after following the teaching and learning process in accordance with educational goals. According to Suprihatiningrum (2013), learning outcomes are abilities that students have as a result of learning behavior and can be observed through student performance. In addition, according to Winkle (in Purwanto, 2011), learning outcomes are changes that result in people changing their attitudes and behavior.

Based on the description above, that learning outcomes are the achievement of each basic ability, both cognitive, affective and psychomotor, which is obtained by students during certain learning activities. So that in this problem posing method the learning outcomes achieved in the form of cognitive aspects are in the aspect or level of memorizing ability and application ability after students are given a test. The types of questions used in this study are knowledge (C1), understanding (C2), and application (C3).

According Sudjana (2004) and Aunurrahman (2009), said that the learning outcomes achieved by students are influenced by two factors, namely internal factors (ability, learning motivation, interest and attention, attitudes and learning habits, perseverance, socioeconomic, physical factors, and psychic) and external factors (social environment (including peers), teacher factors, school curriculum, facilities and infrastructure).

The learning method related to this research is the problem-posing method. According to Silver (in Hajar, 2001) problem posing has three meanings, namely: (1) the submission of simple questions or the re-formulation of an existing problem with several changes to make it simpler and understandable in order to solve complicated problems, (2) the formulation of questions relating to the requirements of the questions that have been resolved in order to find alternative solutions or alternative questions that are still relevant, and (3) formulation of the problem or formation of a problem from an available situation, whether done before, when, or after completing a problem.

2. Methodology

This research was carried out in two cycles in Pekanbaru 4 State High School. Research time is appropriate in physics teaching hours which coincide on every Wednesday and Thursday with 3 meetings. Furthermore, the subject of this study were students of grade XI IPA 4 Pekanbaru 4 State High School Riau province with a total of 38 students, with a composition of 14 male students and 24 female students. For this reason, the object of research in class XI Science 4 was 38 students, various activities occurred in the classroom during the application of problem posing learning methods, which included: (1) learning atmosphere during the teaching and learning process, (2) student activity during the process teaching and learning, (3) student learning outcomes, and student qualitative description data. Then, this study, in collaboration with NofitaEkasari, S.Si, as a class XI Physics teacher at Pekanbaru 4 State Senior High School.

The technique used for data collection, namely: documentation, interviews, observation, tests. The collected data is analyzed and described to describe the state of success of each cycle and the use of problem posing methods in learning. As an indicator of success of this class action research if 85% of students cognitively have a minimum score of 82 (according to KKM from school) and activity of> 72%.

3. Result and Discussion

3.1 Pre Cycle

At the time of the pre cycle, the researcher found that when learning, students were less active in asking questions and answering the questions posed. Less active in this case, students are still ashamed or lacking confidence in asking questions or opinions even though they actually have ideas to make. In addition, the lack of active students in learning is shown by the lack of enthusiasm of students when the teacher is explaining the lesson, not paying attention when the teacher explains the lesson, and there are still students who talk to their friends when the lesson is given. This is one indicator that students have low or less active activities and ultimately lead to learning that is still teacher-centered and not student-centered, student centered. Then the researcher also gets subject matter which is still considered complicated and difficult to understand by students is the balance of objects. This material is considered to be more difficult to understand because there are many mathematical equations which require high memorization power.

In addition, the researcher also made preliminary observations namely by looking at the learning outcomes of previous material students prior to the research. Learning outcomes data obtained the highest score of 82, the lowest score of 50, the average score of 66.9 and the classical completeness of 63.2%. Only 24 students meet the KKM. Seeing the existing problems, the problem posing method is the right solution to overcome them.

3.2 Cycle I

Data from observations of students 'activities in the first cycle were obtained from the observation sheet of students' activeness based on the guidelines for filling out observation sheets. Recapitulation of observations can be seen in the following table:

Table 1. Activity Analysis of Student Cycle 1

Aspects observed	Amount	Percentage	Information
Activity asking	61	49 %	Less
Make individual questions	70	58 %	Enough
Answer individual questions	69	56 %	Enough
Answer questions about friends	56	45,2 %	Less
Convey ideas	52	41 %	Less
Amount	308	49,5 %	Less

Then, students' cognitive observation data after the first cycle evaluation test, can be seen in the following table:

Table 2. Analysis of Student Cycle I Evaluation Results

Learning outcomes of students	Initial Value	Value of Cycle I
The highest score	82	92
Lowest Value	50	73
Number of students who have completed learning	24	29
Average value of students	66,9	82.1
Percentage of completeness	63,2 %	76,3 %

From the results of the first cycle evaluation, it can be seen that the classical completeness obtained by 76.3% has not met the specified classical completeness of 85%. In cycle I, problem posing learning methods are applied. In carrying out the learning steps with this method, students still look less than optimal and look still confused, because students are still in the level of adaptation. The maximum lack of students in learning is seen when they are always asking about how to make the question. This happens because students still feel confused about what questions they should make, so the discussion time that has been determined in the learning implementation plan has shifted slightly.

Observation results can be seen from each aspect, namely activeness asking students in learning by 49%, ability to make individual questions by 58%, ability to solve problems made by themselves by 46%, ability to solve questions made by friends 45.2%, and convey ideas by 41%. The percentage of observations of the activities of students shows that their thinking and active abilities are lacking. They are still confused in making questions that have an impact on solving the problems that they make themselves. The level of delivery of ideas is also still low, as seen from the number of students who are willing to refute friends' answers if the answers are not the same as their answers.

Then for the learning outcomes of students, there are still many students who have not fulfilled the KKM, out of 38 students only 29 students who meet the KKM determined by the school are 82, with classical completeness below the prescribed standard of 76.3%, for that further improvements need to be made in cycle II.

3.3 Cycle II

Data from observations of students 'activities in cycle II were obtained from the observation sheet of students' activeness based on the guidelines for filling in the observation sheet. Recapitulation of observations can be seen in the following table:

Table 3. Activity Analysis of Student Cycle 1

Aspects observed	Amount	Percentage	Information
Activity asking	68	54,8 %	Enough
Make individual questions	83	66,9 %	Good
Answer individual questions	79	63,7 %	Good
Answer questions about friends	83	66,9 %	Enough
Convey ideas	69	55,6 %	Enough
Amount	382	61,5 %	Good

Student evaluation data from the results of cognitive observations in cycle II can be seen in the following table:

Table 4. Analysis of Student Cycle I Evaluation Results

Learning outcomes of students	Value of Cycle II
The highest score	96
Lowest Value	73
Number of students who have completed learning	35
Average value of students	86,74
Percentage of completeness	92,1 %

From the data above it can be said that students have achieved classical completeness in cycle II with a value of 92.1%. Cycle II is an improvement of weaknesses that occur in cycle I based on reflection. In this second cycle students are familiar with problem posing learning methods. This can be seen from the increase in activities that can be seen on the observation sheet, the ability to ask students increases to 54.8%, the ability to make individual questions 66.9%, the ability to solve self-made questions 63.7%, the ability to complete tasks made by friends 66 , 9%, and the ability to convey ideas is 55.6%. Learners are getting used to making problems, completing them, and responding to their friends' problems.

Like the increase in student activities, learning outcomes in cycle II also increased, classical completeness increased to 92.1%, with the highest score 96, the lowest score of 73, and the average grade of 86.74. Students who meet the KKM as many as 35 students, in this case experience an increase of 6 children. For more details can be seen in the following graph:

Results of Comparison of Pre-Cycle Evaluations, Cycle I and Cycle II

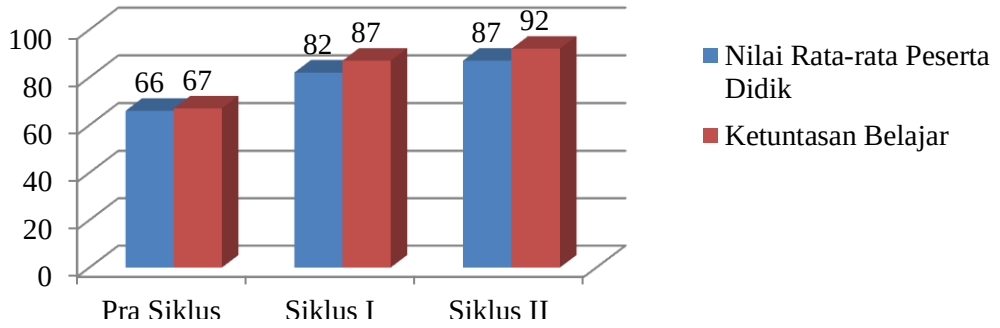

Figure 1. Comparative Evaluation Results

Hasil Perbandingan Keaktifan Peserta Didik Siklus I dan Siklus II

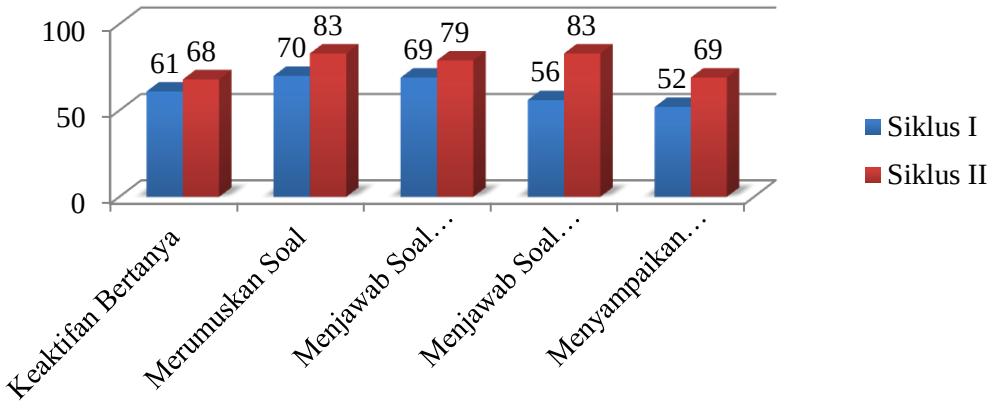

Figure 2. Activity Comparison Results

4. Conclusion

The research that the writer did about the application of the problem posing method as an effort to increase activity and learning outcomes in the material rigid body balance in SMA Negeri 4 Pekanbaru, can be concluded that: (1) the learning process by applying the problem posing method in SMA Negeri 4 Pekanbaru increasing the activeness of students in learning, especially making questions from statements made by the teacher, (2) increasing learning activeness from cycle I to cycle II, namely: activeness indicator asking questions of 5.8%, ability to make questions 8.9%, the ability to solve problems made by himself was 7.7%, the ability to solve questions made by friends was 21.7%, and the ability to convey ideas was 14.6%, and (3) Problem posing methods can improve student learning outcomes, from the average score as much as 82.1 and classical completeness of 76.3%, in the first cycle the average score of students was 86.74 and classical completeness amounting to 92.1%.

Based on these conclusions, researchers need to provide suggestions, among others: (1) For schools, it is expected that little by little can complete learning resources (books / teaching aids) so that students are more actively encouraged so as to be able to improve achievement by learning with facilities that there is. (2) For teachers, should bring more potential and creativity of students by making them more active in learning, providing reinforcement and the relationship between material and daily life, especially in physics subjects makes students more enthusiastic in following the lesson. (3) For students, it is better when the teacher applies a learning method in class, they can follow the teacher's instructions so that the results achieved can be in accordance with what is expected by the teacher.

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