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THE EFFECT OF PROBLEM POSING LEARNING MODEL ON STUDENT LEARNING OUTCOMES AT SMA NEGERI 19 MEDAN

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ABSTRACT

This study aims to determine the effect of the problem posing learning model on high school students' physics learning outcomes. This research is a type of quasi-experimental research with a two-group pretest and posttest design. The population of this study consisted of 10 classes and the sample was taken by means of cluster random sampling. Class XI-1A as the experimental class and class XI-1B as the control class, each of which has 30 students. The instrument used in this study was a test of learning outcomes in the form of multiple choice of 20 questions and student activities using observation sheets. Data analysis was performed by t test. The results showed that the average pre-test and post-test values in the experimental class were 54.83 and 75.33, respectively, while the average pre-test and post-test scores in the control class were 53.83 and 64.33, respectively. The activity of students in the experimental class increased at each meeting by 60.33 (active enough) at the first meeting, the second meeting was 67 (active enough) and the third meeting was 70.33 (active) with an average of 65.88 in the moderately active category. Data analysis using the t test concluded that there was an influence of the problem posing learning model on high school students' physics learning outcomes.

Keyword: Problem Posing, Learning Activity, Learning Outcomes.

INTRODUCTION

In the law on the national education system number 20 of 2003 education is defined as activities and real efforts to create a learning atmosphere and learning process. According to Sanjaya (2009:2-3) learning outcomes are one of the factors that can determine the learning process. So whether or not the quality of the learning process is very dependent on the ability and behavior of educators in managing activities in the classroom.

According to Hamalik (2001:9), experience is a source of knowledge and skills. Because a person's learning experience can be used as a source in seeking knowledge which is then able to encourage the achievement of learning gains for students.

Learning outcomes are results that can be obtained after going through various learning processes within the educational unit environment. That way, it will be in accordance with the opinion of Dimyati &

Mudjiyono (2009:3) learning acquisition is considered a better level of intellectual development compared to before the action. The intended level of intellectual development relates to the learning points obtained after the learning process. In general, learning acquisition is considered as a collection of results or parts in the stages of learning.

To support optimal learning outcomes, learning activities are needed that are planned and have goals, because without learning activities there will be results learning cannot be obtained and learning experience is also not owned so that all activities are wasted by time, direct experience in learning is learning activities, and there is no learning without learning activities.

Educators are the most likely factor in influencing learning, besides that educators are also required to have good competence approach in order to be able to create a learning environment that is comfortable and fun. To reduce these problems is necessary an educator who has good creativity and is able to understand conditions of the learning environment, so as to produce a good learning environment interesting, an interesting learning environment in physics is defined as inviting students to associate phenomena that exist in everyday life After that students will be able to find their learning experience through teaching and learning process in the classroom.

According to Arkundanto (2007:27) Physics is the study of nature universe which is then very closely related to phenomena in life daily. Physics subjects are generally still a subject that very difficult to get maximum learning results.

Factors that influence learning outcomes according to Muhibin (2008:184) namely internal factors and external factors, such as internal factors phychological factors. External factors such as environmental factors and intrumental factors.

Research Methods

The research was conducted at SMA Negeri 19 Medan, Jalan Seruwai No.1, Sei Mati. Medan Labuhan District, Medan City, North Sumatra 20253. The time of the research was carried out in the even semester of the 2022/2023 school year.

The population in this study were all students of class XI SMA Negeri 19 Medan in the even semester T.P. 2022/2023 consisting of 30 students. The research sample was taken from two population classes using cluster random sampling technique. One class was used as the experimental class, namely class XI-1A using the problem posing learning model and one control class XI-1B using the direct learning model.

This research involved two classes which were given different treatment. To find out student learning outcomes obtained with two treatments on students who were given a test. The tests given were pre-test before treatment and post-test after treatment. Thus the research design is two groups (pretest and posttest).

Researchers gave pretests to the experimental class and the control class. The instrument used in this study consisted of 20 questions Multiple choice.

The learning outcomes test was first standardized using a content validity test by two lecturers and one teacher according to the experts. After the pre-test data was obtained, the data was analyzed using the normality test, namely the Lilliefors test, homogeneity test and variance similarity test. After that, a two-party t-test hypothesis test was carried out to find out the students' initial abilities in the two sample groups, in this case the initial abilities of the two samples must be the same. Furthermore, the researchers taught the subject matter using the problem posing learning model in the experimental class and the direct learning model in the control class. The post-test data were subjected to a prerequisite test with the normality test and homogeneity test, then a t-test was carried out to find out whether there was an effect of the problem posing learning model on student learning outcomes compared to the direct learning model on the subject matter of sound waves.

Data analysis used t test and effect size test to find out how much influence the use of problem posing learing models has on student learning outcomes, according to Sugiyono (2013:251) the t test is used to compare the result data before and after treatment.

Results

Research that has been carried out in the experimental class with the problem posing learning model obtained physics learning outcomes with the highest score of 90 and the lowest score of 50. Physics learning outcomes obtained from the control class using the direct learning model obtained the highest score of 80 and the lowest score of 45.

Based on the results of the study, it was obtained data on physics learning outcomes for experimental class students using the problem posing learning model are presented in Table 1.

Table 1. Experimental Class Pretest and Posttest Values

Experiment Class	Mean	SD	Varians
Pretest	54,83	8,415	66,341
Posttest	75,33	9,553	91,259

Based on Table 1, it can be seen that the average value of the experimental class after being treated with the problem posing learning model is 75.33 with a standard deviation of 9.553.

Based on the data obtained, it is known that the posttest score in the experimental class has a value of 90 for 3 students and the lowest score is 50 for 2 students. Overall student learning outcomes in the experimental class are presented in Table 2.

Table 2. Distribution Of Experimental Class Pretest and Postest Values

Class	Pretest		Posstest	
	Interval	Frequency	Interval	Frequency
1	40-45	6	50-56	2
2	46-51	3	57-63	0
3	52-57	6	64-70	9
4	58-63	14	71-77	0
5	64-69	0	74-84	16
6	70-75	1	85-91	3

Based on the results of the study, it was obtained data on physics learning outcomes of control class students with the direct learning model are presented in Table 3.

Table 3. Control Class Pretest and Posttest Values

Control Class	Mean	SD	Varians
Pretest	53,83	10,722	114,961
Posttest	64,33	11,651	135,745

Table 3 it can be seen that the average value of the control class after being given direct learning was 53.83 with a standard deviation of 10.722. Before being given treatment, students were first given pretest questions to determine students' initial abilities. The questions given are in the form of multiple choices with levels C1-C6. After getting the pretest score, learning is given using a direct learning model. After completing learning, students are given posttest questions in the form of multiple choice with C1-C6 levels to determine student learning outcomes.

Based on what was obtained, it was known that the posttest score in the control class had the highest score of 80 for 11 students and the lowest score of 45 for 7 students. The learning outcomes of control class students as a whole are presented in the Table 4.

Table 4. Distribution Of Control Class Pretest and Posttest Values

Class	Pretest		Posstest	
	Interval	Frequency	Interval	Frequency
1	40-45	9	45-50	7
2	46-51	6	41-56	4
3	52-57	4	57-62	4
4	58-63	5	63-68	0
5	64-69	2	69-74	4
6	70-75	2	75-80	11

Based on the data from the pretest results of students in the experimental class and control class, the normality test and pretest data homogeneity test were carried out first. The results of the calculations show that the pretest data is normally distributed and

homogeneous, so the data hypothesis test is carried out using the t test. In summary, the data hypothesis test can be seen in the Table 5.

Tabel 5. Summary of t test calculation results for pretest data

Pretest Data	Mean	t_{count}	t_{table}	Conclution
Experimen	54,833	0,406	2,001	The initial ability of student is the same
Control	53,833			

Based on the results of the calculation of the t test, it was obtained tcount<ttable, it was concluded that the students' initial abilities in the experimental class and the control class were the same. The next step taken by the researcher after giving the pretest to the experimental class was to provide treatment using the problem posing learning model.

Then after the treatment of the posttest results is carried out hypothesis testing to find out whether there is an influence in using the problem posing learning model, the results of the hypothesis testing are stated in Table 6.

Table 6. Summary Of Posttest Data Hypotesis Calculation Result

Post-Test Data	Mean	t_{count}	t_{table}	Conclution
Experimen	75,333	3,9987	2,0017	There is an influence of the problem posing learning
Control	64,333			

During the teaching and learning activities the researcher was assisted by 1 observer to observe student activities. The results of observing student activity in the experimental class are shown in the Table 7.

Table 7. Result of observation of experimental class learning activities

Meeting	Mark	Information
I	60,33	Quaite Active
II	67	Quaite Active
III	70,33	Active

Based on Table 7, student activity in the experimental class at each meeting has increased which leads to student activity.

Discussion

Through the results of research data analysis for the two-party t test there is influence significant to the treatment using the problem posing learning model in the experimental class. The increase in learning outcomes in the experimental class is due problem posing learning model can help students to conduct an in-depth investigation of the sub-topics of the material and find problem solving by themselves through the learning phase. This state will help students to develop knowledge individually.

The increase in learning outcomes in the experimental class is also due to the model Problem posing learning provides opportunities for students to participate active and enthusiastic in working in teams to find and investigate learned physics concepts. Students who are classified as smart or those who already understand the material will be able to provide knowledge to group members who do not understand. This results in students Those who don't understand are more open and free to learn less material understandable.

Thus, students are aware that other people's opinions can be enrich their knowledge. In addition to investigations into learning outcomes, there are also investigations through observation activities namely the assessment of students' learning activities.

Activity assessment This learning is done to see the development of student activity through the application of the problem posing learning model is accompanied by activities experiments conducted in class. But this is not done on control class because the control class uses a learning model which is a learning model commonly used by educators in the school on physics subjects and did not apply the method experimentation in their activities.

Based on the data on the results of learning activities, it can be seen that the use

of problem posing learning models can increase students' learning activities. The learning activities of students experience an increase in each meeting. The average value of students' learning activities at meeting I was 60.33 with the category quite active, the average value of students' learning activities at meeting II was 67 with the category

quite well, and the average value of student learning activities at meeting III is 70.33 with the active category, so that the average value is obtained meeting of student learning activities is 65.88 with quite active category.

From the description of learning outcomes and learning activities in the experimental class, obtained better learning outcomes with a significant increase in value compared to the control class. Therefore, the problem learning model posing makes a difference to learning outcomes in aspects of knowledge and psychomotor aspects of students for carrying out 3 phases of learning, namely : listening, dialogue and action, these stages besides being able to make students' knowledge better, at this stage also students Dare to participate actively so as to be able to come up with ideas that make the activities in the study room are getting more exciting, so that a process occurs learning students learn actively and educators only as facilitators.

This is also evidenced by the increased value of learning activities. problem models This posing affects the skills of higher order thinking and making students through group learning activities are able to exchange ideas and gain new knowledge from their group mates.

Based on the explanation above, the problem posing learning model is different able to improve student learning outcomes, problem learning models Posing is also able to increase the active learning of students, this is supported

by Suryosubroto's statement (2009: 203) that the problem posing model have an impact on increasing student learning activities for the better.

Increased learning outcomes also occur because there are processes in the learner, there are experimental activities carried out in the experimental class using LKPD (student worksheets) at each meeting. Through LKPD, students are required to prove and carry out an experiment that related to sound waves. The results obtained at the meeting LKPD I got the result that students can analyze problems and can write their hypotheses well. LKPD results at meeting II the results showed that students were able to prove the speed of sound propagation in air quite well as evidenced by the work of LKPD through formulation problems and draw conclusions in experiments. LKPD results at the meeting III by experimenting with the Doppler effect the students were able to demonstrate truth in the calculation of listener frequency using existing concepts in the point of discussion of LKPD, this shows that students understand in distinguishing the concept of positive and negative values in the Doppler effect formula. LKPD in this study really gives the impact of change understanding of existing concepts, and LKPD makes students able to interact directly with the problems faced and able to solve them problems, the concept of understanding success in this LKPD is appropriate with Rahayu and Juliana (2016:112) who stated that students learn solve problems, evaluate solutions, and think logically students study in groups can be seen from the way they write hypothesis.

Conclution and Recomendation

From the results of the research that has been done, it can be concluded that student learning outcomes using the problem posing learning model are higher than the direct learning model. This can be seen through the hypothesis testing that has been carried out with tcount > ttable (3.9987 > 2.0017) which states that there is an influence of the problem posing learning model on student learning outcomes in sound wave material.

Advice that can be given to further researchers is excellent time management so that the learning process can run smoothly.

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