THE EFFECT OF THE USE OF PROBLEM BASED LEARNING (PBL) MODEL ON THE RESULTS OF STUDENTS LEARNING SCIENCE IN SMP

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Abstract

The purpose of this study is to determine the effect of the use of the problem-based learning (PBL) learning model on science learning outcomes of students of SMP Negeri 2 Ruteng Beokina in the academic year 2019/2020. In this study, researchers used a type of survey research with a quantitative approach. The design of this study is ex-post facto. The population in this study were all eighth-grade students of SMP Negeri 2 Ruteng Beokina, with 178 students. The sample in this study amounted to 66 people. The sampling technique uses simple random sampling. Data obtained from the study sample in the form of science learning outcomes value of pressure material. Data analysis using t test. The results of the study indicate that learning physics using PBL learning models can affect the learning outcomes of science students of SMP Negeri 2 Ruteng Beokina in the academic year 2019/2020. This is evidenced by the results of calculations using SPSS software version 24, namely the value t = 19.095, of sig (2-tailed) or (0,000 <0.05) at α = 5% and dk = 65.

Keywords: *PBL Model, Science Learning Outcomes*

1. INTRODUCTION

The implementation of the education process greatly influences the development of human resources (HR). The educational process will change the way people think that is done in school. School is a formal educational institution that has the responsibility to educate students from not knowing to knowing and also as a place for teaching and learning activities to be held. In teaching and learning activities, of course, it has certain goals. To achieve the goal, a teacher must be able to choose a learning model according to the subject being discussed. Because teachers often use a learning model where students only listen and are passive.

According to the Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System (Sisdiknas) chapter 1 article 1 states that education is a planned effort which has the aim of creating an atmosphere for an effective learning process so that belief in God can be instilled, self-control, intelligence, and morals. noble as well as skills for themselves as well as society, nation and state. Based on the explanation above, it can be concluded that education is an effort made deliberately and systematically carried out by teachers and students to improve, develop, advance the intelligence and skills of all those involved in it.

The teaching and learning process is an activity which can shape students to seek predetermined educational goals. The teaching and learning process runs effectively if all components can support each other to achieve the stated goals. Components of these objectives include students, teachers, curriculum, learning models, methods, facilities and infrastructure and work environment. Of these components the most influential is the teacher, because without the teacher the other components cannot be implemented. Teachers are as educators. The task of the teacher as an educator is so that students can understand and understand the lessons given. The task of the teacher must also be able to choose a good teaching and learning strategy that is suitable for application in the classroom. Therefore, an appropriate learning model is needed so as to obtain the expected learning outcomes.

Berdasarkan data UNBK 4 tahun Finally, at SMP Negeri 2 Ruteng Beokina, there was a problem in the learning process,

namely the low learning outcomes of science learning. The low science learning outcomes are due to the teacher who delivers material with the lecture method and does not hold practical work so students find it difficult to understand. The teacher's lecture method speaks more, so that student activity is very low. Low activeness causes students to be less enthusiastic in participating in learning, and of course has an impact on the grades obtained by students. Low activity can also lead to a lack of motivation in themselves so that students are lazy to learn and find out new things (Slamento, 2003). When students are lazy to learn, it will have an impact on grades, namely not reaching the minimum completeness criteria (KKM) that have been set at SMP Negeri 2 Ruteng Beokina. The KKM score at SMP Negeri 2 Ruteng Beokina for class VIII is 65. One way to create student performance is to apply the Problem Based Learning (PBL) model. PBL learning emphasizes where students are able to maintain a problem so that they can foster an independent attitude. Based on the results of preliminary observations made with the science teacher at SMP Negeri 2 Ruteng Beokina, the learning model used before studying at home is Problem Based Learning (PBL). The PBL model is applied by science teachers to substance pressure material and its application in everyday life. Besides the teacher, the most important component is the curriculum. The 2013 curriculum has been implemented at SMP Negeri 2 Ruteng Beokina. The 2013 curriculum is highly demanded so that students are active, creative, and innovative.

To obtain satisfactory learning outcomes, serious handling and thinking is needed, so that the material presented is well accepted and understood by students. Handling is like by choosing an appropriate learning model. Therefore, every learning process that is designed and organized must have actions to achieve the expected learning objectives. One of the learning processes is natural science (IPA). Therefore, science teachers as educators and mentors must try to motivate students to be accustomed to working independently and creatively and innovating in learning. The PBL model emphasizes the process of student involvement in finding the material being studied and relating it to real life (Janah & Widodo, 2018). Students are required to be able to solve a problem. The problem-based learning model includes constructivism theory. Constructivism theory is the basis of providing a knowledge of attempts to deconstruct mechanical learning. The idea of constructivism has a summary of knowledge, namely: knowledge is not a mere picture of the world of reality, the subject forms schemes (cognitive, categories, concepts, and structures that need to be related to knowledge), and one's concepts will shape knowledge. Constructivism places more emphasis on authentic rather than artificial learning. Authentic learning is the process of a person's interaction with the object being studied is more real. Authentic learning can connect text with a more real situation (Suprijono, 2009).

The PBL model is the number of problems that require more concrete solutions (Azmi et al., 2017). PBL is widely applied in various fields and educational contexts. Applied PBL aims to promote critical thinking and problem solving in more real learning situations. Learning from real and meaningful problems through investigation, explanation, and resolution is the main principle of the optimal PBL model. Based on this view, PBL is a type of learning that involves students and is given the opportunity to design activities from problem solving investigations to conclusions. PBL is a pedagogical approach that allows students to learn and be actively involved with meaningful problems. In the PBL learning model, students are given the opportunity to solve problems in a collaborative group, develop a good mentality, form independence, and reflect. PBL is a learning model designed so that students gain knowledge and are able to solve problems and create learning both independently and in teams (Nasar & Kurniati, 2020). PBL aims to develop students' learning independence and social skills (Farisi et al., 2017). The PBL model emphasizes that students can cultivate their abilities to make it easier to understand science material because the phenomena

studied are closely related to real life (Daimatul Makrifah, Sudarti, 2015).

The PBL model is learning about real-world problems for students to learn about critical thinking so that they will gain knowledge and concepts according to the lesson (Mairani & Simatupang, 2018). PBL prioritizes the learning process where a teacher is only tasked with helping students achieve self-improvement skills (Sumantri, 2015). In the PBL model, a teacher provides an opportunity for students to determine a topic. With the topic, students can discuss and solve problems regularly and logically. The understanding of some of the experts above can be concluded that PBL learning is a model that gives students the opportunity to design investigative activities using problem solving to reach conclusions in a group so that they will gain knowledge and an attitude of independence.

The PBL learning syntax consists of 5 phases (Suprijono, 2009). The five phases of the PBL learning syntax can be seen in Table 2 below:

Tabel 2. Sintaks *Problem Based Learning*

Phase	Educator behavior
1. Provide an orientation about the problem	Explain learning objectives, and motivate students to be actively involved in problem-solving activities
2. Organizing students to research	Helps define and organize learning tasks related to the problem
3. Helping to investigate independently and in groups	Encourage students to collect appropriate information, carry out experiments, seek explanations and find solutions.
4. Develop and present artifacts and exhibits	Assist students in planning and preparing appropriate artifacts, such as reports, video recordings, and models and then presenting them
5. Analyze and evaluate the problem-solving process	Helping students reflect and evaluate investigations and the processes being carried out.

2. RESEARCH METHOD

The type of research used in this study is a survey with a quantitative approach and an ex-post facto research design. The place for this research was carried out at SMP Negeri 2 Ruteng Beokina in the 2019/2020 school year. The research period is from February to July. The sample in this study amounted to 66 people, using simple random sampling technique.

The independent variable in this study is the problem-based learning model. The dependent variable is student learning outcomes. Data collection techniques using documentation and interview techniques. The instruments in this study were documentation and interview sheets. The data analysis technique used is descriptive and inferential. Descriptive analysis techniques are used to determine the maximum, minimum, mean, variance, and standard deviation values. While there are two inferential data analysis techniques, namely normality test and hypothesis testing.

3. RESULT AND DISCUSSION

Descriptive data for the sample class is shown in Table 3 below:

Table 3. Data of Sample Class Student Test Scores

Component	Score
Minimum	68
Maximum	90
Mean	79,00
Variants	35,477
Standard deviation	5,956

Table 3 above shows that the maximum value is 90, the minimum is 68, the mean is 79.00, the variance is 35.477 and the standard deviation is 5.956. Descriptive data were obtained using SPSS software version 24. The results of normality testing using SPSS software showed a significant value

(sig.)> 0.05. Thus, the sample data is normally distributed. The results of normality can be seen in Table 4 below: Criteria for learning outcomes can be seen in Figure 1 below.

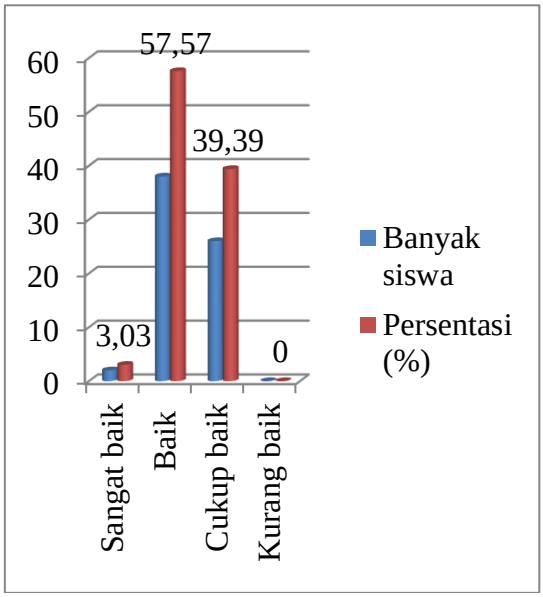

Figure 1 Diagram of Learning Outcomes Criteria

Based on the diagram above the students who get the very good category are 2 people, good 38, quite good 26, and less good 0. So, it can be concluded that all students get a score above the KKM. Where the KKM value that has been determined is 65.

Table 4. Results of Learning Outcomes Normality Test

Tests of Normality						
	Kolmogorov-Sminov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
The value of learning outcomes	0,072	66	0,200	0,970	66	0,116

Based on the data analysis results using SPSS version 24 shows that the normality test sig value = 0.200. On the learning outcome data is significant above 0.05 (Sig 0.200> 0.05). Therefore, learning outcomes are normally distributed. So, it can be concluded that the learning outcome data is normally distributed.

Table 5. Hypothesis test of learning outcomes

One-Sample Test						
	Test Value = 65					
	t	df	Sig. (2-tailed	Mean difference	95% confidence interval of the difference	
					Lower	Upper
The value of learning outcomes	19,095	65	0,000	14,000	12,54	15,46

Based on the results of the analysis using SPSS version 24 which is listed in table 4.4, the calculation value of t = 19.095, df = 65, mean difference = 14.00, lower = 12.54, upper = 15.46, and sig (2-tailed) 0.000. The sig (2-tailed) calculation value is smaller than the predetermined value, namely 0.05 (0.000 <0.05). So, H0 is rejected and H1 is accepted. Thus, it can be concluded that there is an effect of using problem-based learning models on student learning outcomes.

Thus, H0 is rejected and H1 is accepted. Thus, the use of the problem-based learning model affects the science learning outcomes of SMP Negeri 2 Ruteng Beokina students in the 2019/2020 school year.

The problem-based learning model is one of the scientific approaches. The reason for choosing the Problem Based Learning learning model is that students can find and solve problems. By solving problems students can learn for real. Problem Based Learning (PBL) learning model involves students in a more real inquiry process. Investigations are carried out in order to answer questions and find answers, so that we can understand new things. So problem-based learning requires students to seek real problem solutions. Students must be able to analyze, identify, develop hypotheses, make predictions, collect, conduct experiments,

and draw conclusions. Before entering the classroom, of course, the teacher must first prepare the lesson plan based on the syllabus. Students are said to be successful if they are not only able to remember, but also solve a problem. By solving problems students can understand concepts and gain basic knowledge. Not only that, students can also be responsible, have the courage to make quick and correct decisions and stimulate curiosity.

Learning outcomes are changes in overall behavior where the assessment is obtained through 3 aspects, namely: knowledge, skills, and attitudes as measured by tests. So that in the learning process students appear more active and can learn independently in order to develop problem solving skills. In this study, which is used to measure learning outcomes is the cognitive aspect. The effect of the PBL learning model as a teacher treatment in the classroom provides benefits to improve student learning outcomes. Based on the research results, after being given the test, it shows that the PBL model has an effect on student learning outcomes. This can be shown in the significant value obtained through the SPPS version 24 application, namely t = 19.095, df = 65, sig. (2-tailed = 0,000), mean difference = 14,000, lower = 12.54 and upper = 15.46. The type of research used is survey research with a quantitative approach. This study was used to determine the effect of the PBL model on the science learning outcomes of SMP Negeri 2 Ruteng Beokina students. The design used in this research is ex-post fackto. The sampling technique was side simple random. The data collection technique was a multiple-choice written test. The instruments in this study were documentation and interview sheets. The KKM score that has been set for the science subject at SMP Negeri 2 Ruteng Beokina is 65. In the final test results the scores obtained by students reach the KKM. Through the calculation of the one-sample t test, the sig (2-tailed) value is smaller than 0.05 or (0.000 <0.05). Based on the results of the t-test calculation, the hypothesis is accepted, namely H0 is rejected and H1 is accepted. This can also be seen in the results of the analysis with a significant level (α) = 0.05. From these data it can be concluded that the PBL learning model affects the science learning outcomes of SMP Negeri 2 Ruteng Beokina students in the 2019/2020 school year.

This section presents the research results. The results of the research can be completed with tables, graphs (images), and / or charts. The discussion section describes the results of data processing, interprets the findings logically, associates with relevant reference sources.

4. CONCLUSSION

The results of this study can be concluded that the use of the PBL learning model can affect the science learning outcomes of class VIII students of SMP Negeri 2 Ruteng Beokina in the 2019/2020 academic year at least achieving the KKM score of 65. This is evidenced by the results of data analysis using SPSS version 24 software. where the sig (2-tailed) value of 0.000 is less than 0.05 or (0.000 <0.05). Based on the results of research, discussion, and conclusions, it is suggested that learning outcomes are influenced by the learning model used by the teacher. If the learning model used is good and is implemented according to the procedure, then student learning outcomes will have an effect. In addition to the learning model, the media and facilities and infrastructure are very supportive of the comfort and success of students in learning.

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