



## The Influence of Project-Based Learning Model on Learning Outcomes of Class VIII Students At Private Junior High School Tri Sakti Lubuk Pakam

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**Abstract:** Based on the background, the learning model that is often used in class VIII of Tri Sakti Lubuk Pakam Private Middle School still tend to use conventional learning models or lecture methods and only apply His mathematical formulas, resulting in student responses being less enthusiastic and less active whenever Science-Physics learning takes place. So that, this study aims to determine the effect of the learning model *Project Based learning* on student learning outcomes in class VIII energy material at Tri Sakti Lubuk Pakam Private Middle School. The method used in this research is *Like an experiment* with a population of all eighth grade students at Tri Sakti Lubuk Pakam Private Middle School. The sample in this study consisted of 2 classes using the technique *Purposive Sampling*. The instrument used was a learning achievement test in the form of multiple choice item items of 20 questions. Before being given treatment to the sample, a pre-test was first carried out to find out whether the sample came from a normally distributed and homogeneous population. Then given treatment to both classes, namely by giving a test *pretest* and obtained an average score of 38.00 for the experimental class with a standard deviation of 16.01 and for the control class 40.00 with a standard deviation of 15.75. For the average score *Posttest* experimental class 77.40 with a standard deviation of 9.35 and control class 62.60 with a standard deviation of 11.00. Homogeneous value *pretest* to both classes ( $1.033 < 1.983$ )  $F_{\text{count}}$  smaller than  $F_{\text{table}}$  and value *posttest* namely  $F_{\text{count}}$  smaller than  $F_{\text{table}}$  ( $1.379 < 1.983$ ), so it can be said that the value *pretest* and *posttest* to both samples is homogeneous. Furthermore, for the difference between the two classes, a one-sided t-test was carried out with  $\alpha = 0.05$  obtained  $(5.120) > (1.677)$   $t_{\text{count}}$  bigger than  $t_{\text{table}}$  which states that there is a difference between the two classes. To see the magnitude of the influence of the model *Project Based Learning* on learning outcomes a simple regression test is carried out with the equation  $\bar{Y} = 57,27 + 0,28X$ . So it can be concluded that there is a significant effect of the treatment of the learning model *Project Based Learning* on student learning outcomes in class VIII energy material at Tri Sakti Lubuk Pakam Private Middle School

**Keywords:** *Project Based Learning*, Energy and Learning Outcomes

### 1. INTRODUCTION

Education is an effort to educate the nation's life and is an activity carried out by students that takes place continuously. According to RI Law no. 20 of 2003 concerning the national education system, the purpose of education is to educate students to be able to develop their own potential to become human beings who believe and have piety, good personalities, have noble morals, have useful knowledge and become a useful community for the homeland, the nation and the state (Noor Tajuddin, 2018). Improving the quality of education in Indonesia, currently the government continues to make efforts through curriculum changes. This curriculum change occurred in Indonesia, namely to emphasize students' better understanding of learning (Permendikbud, 2016). Currently the national curriculum in Indonesia is the independent learning curriculum, although some schools still use the 2013 curriculum learning. He current curriculum is more about developing learning models that should be applied to students so that they make students more active and easy to understand.

In carrying out teaching and learning activities the teacher needs to choose and use a learning model that is appropriate to the teaching material that will be delivered to students. Using the right learning model will really help students develop their thinking skills and increase activity, motivation and creativity so that it influences student learning outcomes, especially in Science-Physics subjects (Dyah Kristanti et al., n.d.). It can be seen that the teacher has a very important role in the ongoing learning activities, where the learning process is the core of the overall educational process (Sopian et al., 2016)

Learning is an effort to make every student grow. Learning does not only develop knowledge but also involves the development of students in terms of affective and psychomotor. Learning is a form of assistance given by a teacher in order for the process of acquiring knowledge and knowledge, mastery of skills and habits, as well as the formation of attitudes and trust in students. In other words, learning is a process to help students learn well. High quality learning comes from learner motivation and student creativity.

Highly motivated students accompanied by teacher support who can provide facilities for this motivation will lead to successful achievement of learning objectives. Learning objectives can be measured through changes in students' attitudes and abilities. Good learning design is adequate facilities coupled with the creativity of educators that will enable students to more easily achieve learning goals. According to sahrani in (Faizah, 2017) "Learning" has many meanings including learning is a change that a person gets after going through a learning process.

Learning outcomes are processes within individuals who interact with the environment to get changes in their behavior, Purwanto in (Prihatini Effiyati, 2017). Learning outcomes are related to achievement in acquiring abilities according to the specific goals planned, thus the main task of the teacher in this activity is to design instruments that can collect data about student success in achieving learning goals. Based on this information the teacher determines the instrument and also needs to design how to use the instrument along with the success criteria (Harefa et al., 2020).

The grouping of learning outcomes from Benjamin Blomm in (Firmansyah et al., 2017) is broadly divided into three domains, namely: cognitive, effective and psychomotor. Physics learning outcomes are the results of the learning process carried out by students in mastering the material, understanding concepts, solving problems in learning physics. By studying physics students are expected to be able to apply physics concepts in everyday life. By knowing the extent to which a person has mastered the material that has been taught, it can be used as a measure of student success, Purwanto in (Prihatini Effiyati, 2017)

Based on the results of interviews with teachers in the field of Science-Physics, Head of Secretary, Deputy Head of Secretary and also Student PKS at Tri Sakti Lubuk Pakam Private Middle School on March 8 2023, so far teachers still tend to carry out learning with conventional learning models, lecture methods and only apply formulas mathematics or calculations when solving physics problems. This indirectly illustrates that the learning process is more focused on the teacher. Also based on the results of my observations when carrying out Community Service activities (PKM) at the same school, the learning carried out using this learning model the students' responses became less enthusiastic and less active whenever Science-Physics learning took place. In addition, it is also known that many students do not have an interest in studying the Science-Physics material so that it affects their learning outcomes to decrease. In this observation, researchers will conduct research on students in class VIII-1 and VIII-2. With the number of students in class VIII-1 as many as 25 people and class VIII-2 as many as 25 people. From the results of the problems revealed, the application of learning models or methods that are able to invite students to not only develop theoretical abilities, but also can develop think students. So to get an increase in science-physics learning outcomes and students' thinking skills, a form of learning model is needed that trains student-centered learning.

One alternative to overcome this problem, researchers have a solution by applying a project-based learning model (Project Based Learning) in the learning process. Through project-based learning activities, students are involved in research activities to complete a particular project that is focused on implementation and application as well as scientific thinking processes that can affect student learning outcomes. According to (Ratna Mayuni et al., 2019) Project Based Learning is a learning model that uses projects as its goals and involves students in problem-solving activities and other meaningful tasks, gives students opportunities to work autonomously to construct their own learning, and ultimately produces products. valuable student work, and realistic.

Project Based Learning is a learning process that directly involves students to produce a project. Basically this learning model develops more solving skills in working on a project that can produce something (Sari & Angreni, 2018) The learning model of Project Based Learning is often referred to as a teaching method that uses problems in the system with the aim of facilitating students in the process of understanding and absorbing the theory provided. This model uses a contextual approach and fosters students' skills in critical thinking. So as to be able to consider the best decisions taken as a solution to the problems received (Dewi Anggraini & Sri Wulandari, 2021). Project Based Learning is also often called student-centered innovative learning and places

educators as motivators and facilitators, where students are given the opportunity to work autonomously to construct their learning (Eliza et al., 2019).

According to (Murni & Yasin, 2021) project-based learning not only examines the relationship between theoretical and practical information, but also motivates students to reflect on the things they learn in learning in a real project. According to Muhammad Fathurrohman in (Warda Rasidah et al., 2022) Project-based learning can also increase students' self-confidence, motivation to learn, creative abilities, and self-admiration. In addition, the application of project-based learning encourages the growth of creativity, independence, responsibility, self-confidence, and critical and analytical thinking in students. According to Shiva et. al. in (Gandi Wijanarko et al., 2017) explained that PjBL has an effect on learning outcomes and science process skills, while Piliang et. al. in (Gandi Wijanarko et al., 2017) explains PjBL has a better influence in stimulating and developing students' science process skills. The implications of the PjBL model by empowering students' science process skills through scientific performance to solve a problem and produce products so that student learning outcomes are maximized. Based on some of the previous researchers' definitions, researchers use this project based learning learning model to increase the independence of participants in solving a problem they face, increase enthusiasm for learning, students are more critical and confident in showing their creativity.

Based on the problems above, the researcher wants to conduct research at Tri Sakti Lubuk Pakam Private Middle School entitled "The Influence of Learning ModelsProject Based Learning on the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School "with the aim of knowing how much influence the project based learning model has on student learning outcomes and what effect the attitudes experienced by students using this learning model

## 2. METODE

The research method used in this study is methodLike an experiment, namely the experimental method in which control is carried out on only one variable, namely the variable that is considered the most dominant. InAs an experimen t control or variable control cannot be carried out in full. The design concept used in this quasi-experiment isControl Group Pretest-Posttest. The design and design of this study are in table 1 as

Group	Pretest	Independent variable	Posttest
Experiment	$Y_1$	$X_E$	$Y_2$
Control	$Y_1$	$X_C$	$Y_2$

The population in this study were all class VIII participants at Tri Sakti Lubuk Pakam Private Middle School, which consisted of 2 classes with a total of 50 students. In this study, researchers took samples from class VIII-1 and class VIII-, each of which consisted of 25 students. . Sampling in this study is using techniques*Purposive Sampling*. Reasons for using the technique*Purposive Sampling* This is because the number of classes used as samples is in accordance with the research method used, namely the quantitative research method.

In determining which class will apply the learning strategy using project-based learning, it is done randomly using a lottery technique because all classes are considered to have the same knowledge so they have the same opportunity also to be used as an experimental class or control class and obtained class VIII-I as the experimental class and class VIII-II as the control class.

The variables in this study consisted of two variables, namely the independent variable (X) and the dependent variable (Y). The independent variable (X) is the variable using the project-based learning model and the dependent variable (Y) is the learning outcome of class VIII students of Tri Sakti Lubuk Pakam Private Middle School. The instrument used in this study was a test of student learning outcomes on energy material

The learning outcomes test used to measure students' abilities is in the form of multiple choice as many as 20 questions on energy material. The learning outcomes test used for*pretest* and*posttest* next one collected and analyzed quantitatively. To determine the effect of the model used, a hypothesis test was carried out. Basically, before analyzing the hypothesis testing data, a prerequisite data analysis test was carried out, namely the normality test and homogeneity test using Microsoft Excel.

### 3. RESULTS AND DISCUSSION

#### Results

The results of the data that can be explained in this study are the learning outcomes of students regarding energy material in class VIII Tri Sakti Lubuk Pakam Private Middle School by giving different treatments, namely: 1) model *Project Based Learning*, 2) Conventional/lecture learning model. Based on the results of the research, it was found that there was an effect of increasing the learning outcomes of students in class VIII class VIII of Tri Sakti Lubuk Pakam Private Middle School on energy material. Improved student learning outcomes can be proven from the results of the value *pretest* and *posttest* both classes. for more clarity can be seen in picture 1 and picture 2 as follows:

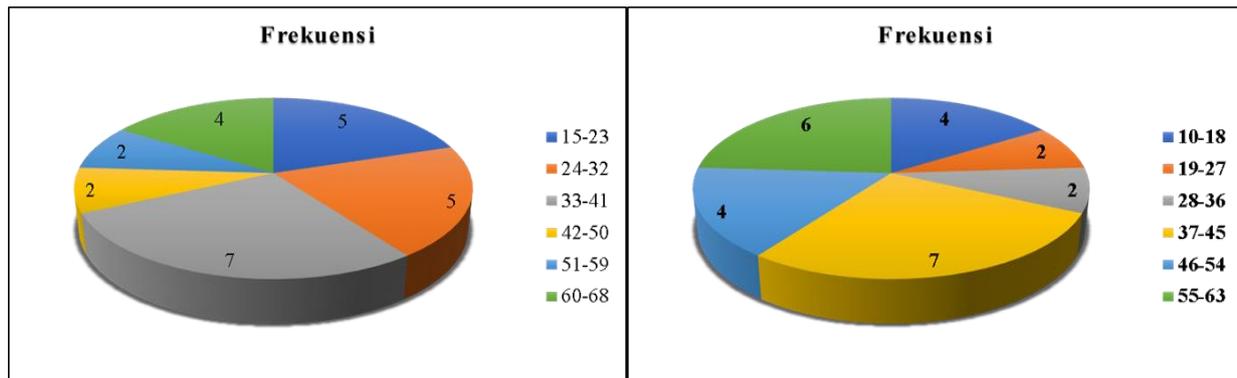


Figure 1. Distribution of results *pretest* experimental class (a) and control class (b)

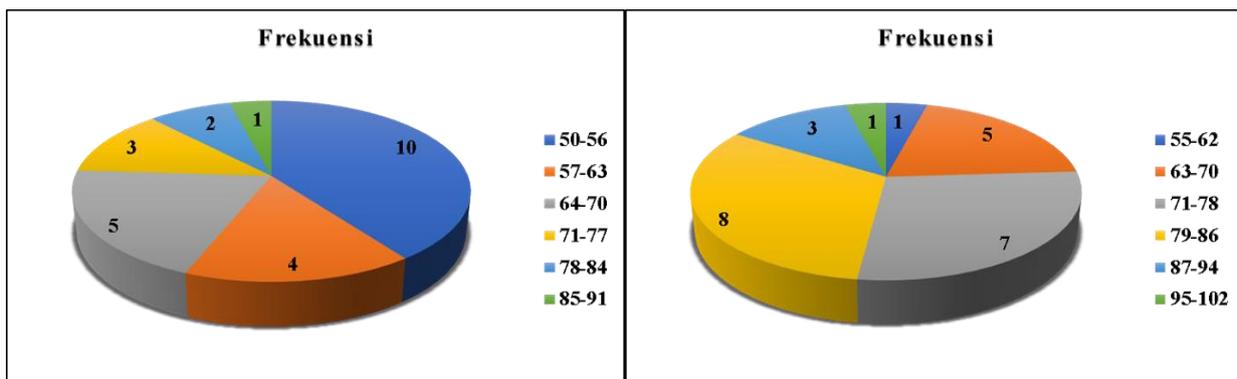


Figure 2. Distribution *posttest* experimental class (a) and *posttest* control class (b)

Based on Figure 1 and Figure 2 the lowest value *pretest* in the experimental class and the control class each obtained at intervals of 15-23 as many as 5 people and 10-18 as many as 4 people and the highest scores at intervals of 60-68 were 4 people and 55-63 as many as 6 people. Lowest value *posttest* the experimental class and the control class were obtained respectively at intervals of 55-62 for 1 person and 50-56 for 10 people and the highest scores were 95-102 for 1 person and 85-91 for 1 person. Based on the results of a thorough data analysis, it can be concluded that there is an increase in student learning outcomes in class VIII-2 as an experimental class using a model *Project Based Learning*

Summary of data normality test results *pretest* and *posttest* presented in Table 2.

Table 2. Summary of Normality Test Results

Data	Class	$L_{count}$	$L_{table}$	conclusion
<i>Pretest</i>	Experiment	0,13	0,173	Normal
	Control	0,10		Normal
<i>Posttest</i>	Experiment	0,12		Normal
	Control	0,16		Normal

The criteria for testing normality data are if  $L_{count} < L_0$  the data is said to be normally distributed.

A summary of the results of the homogeneity test can be shown in Table 3.

**Table 3.** Summary of Data Homogeneity Test Calculations *Pretest* and *Posttest*

Data	Class	Variance	$F_{count}$	$F_{table}$	Conclusion
<i>Pretest</i>	Experiment	256,25	0,133	1,983	Homogeneous
	Control	247,91			Homogeneous
<i>Posttest</i>	Experiment	121,08	1,379	1,983	Homogeneous
	Control	87,75			Homogeneous

As for the criteria for testing the homogeneity of the data, namely if  $F_{count} < F_{table}$  said the sample data is homogeneous

Based on observations made by observers/observers, there is a positive increase in the activities of students in the experimental class with an average student activity of 71. To determine the effect of the learning model *Project Based Learning* on the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School. Then it can be known through the mathematical equation  $Y = a + bX$  regression.

Based on the average value on the results of observation research activities of students with learning models *Project Based Learning* of 71.00 and the average value *posttest* in the experimental class obtained a result of 77.4. So with that a simple linear regression equation is obtained, namely  $Y = 57.27 + 0.28X$ . The value of 0.28 is the value of the learning model *Project Based Learning* as an independent variable that will affect student learning outcomes as the dependent variable

## Discussion

Research using the method *Like an experiment* is research that controls only one variable, namely the *variable* that is considered the most dominant under controlled conditions. In this study initially given *pretest* in the two samples that have been determined not randomly. if the abilities of the students in the experimental class and the control class are the same then proceed with giving different treatments to the two samples. The effect on the two samples can be known through the analysis of the data from the results *posttest* against both classes that have been given treatment.

Mark *pretest* students in the experimental class had an average score of 38.00 with a standard deviation of 16.00 and the *pretest* score in the control class had an average value of 40.00 with a standard deviation of 15.75. Based on the results of the calculation of the two-party t-test hypothesis at a price of  $\alpha = 0.05$  and  $dk = 48$ ,  $t$  is obtained  $t_{count} = 0.445$  and  $t_{table} = 2,010$  eyes  $t_{count} < t_{table}$ , so that it can be concluded that the students' initial abilities were the same in the experimental class and the control class before being given a treatment.

After knowing that the abilities of students are the same, then proceed with treatment using a learning model *Project Based Learning* to the experimental class and the conventional/lecturing learning model to the control class as a comparison. As for the value results *posttest* in the experimental class obtained with an average value of 77.40 with a standard deviation of 9.37 and value *posttest* in the control class obtained with an average value of 62.60 with a standard deviation of 11. Based on the results of the calculation of the two-party t-test hypothesis with a price  $\alpha = 0.05$  and  $dk = 48$  obtained  $t_{count} = 5,12$  and  $t_{table} = 2.010$  with  $t_{count} > t_{table}$ , eye  $H_a$  accepted and  $H_0$  rejected. Based on the data above, it can be concluded that there is a significant influence on the learning model *Project Based Learning* on the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School.

In the experimental class, students' activities were also observed by using a learning model *Project Based Learning* so that an average value of 71.00 is obtained (Appendix 25). Based on the *posttest* scores and the observed scores of student activities, a simple linear regression test calculation of the relationship between each variable can be performed with  $Y = 57.27 + 0.28X$ . From the results of the observer's observations, it was found that the activity of the students experienced a positive increase with a coefficient of 0.28.

In essence, the main purpose of conducting this research is to find out whether there is an influence of the learning model *Project Based Learning* on the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School (Mulyono & Agustin, 2020) . So it can be concluded that the learning model *Project Based Learning* can improve the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School.

#### 4. CONCLUSION

Based on the results thorough data analysis it can be concluded that there is a significant influence on the learning model *Project Based Learning* on the learning outcomes of class VIII students at Tri Sakti Lubuk Pakam Private Middle School.

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