The Influence of the *Discovery Learning* Model on Student Learning Outcomes in Class VIII Pressure Material at SMP Negeri 1 Sawit Seberang

Bunga Widya Lestari [1*], Tedy Putra [2], Dini Puji Anggraini [3]

[1,2,3]Natural Sciences Education Study Program, STKIP Al Maksum Langkat

* Corresponding Author: bungawidyalestari84@gmail.com

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ABSTRACT

This research aims to determine the effect of the *Discovery Learning* model on student learning outcomes in class VIII pressure material. This

This research aims to determine the effect of the Discovery Learning model on student learning outcomes in class VIII pressure material. This research uses Quasy Experimental Design with a Pretest-Posttest Control design with probability sampling techniques. Data collection was carried out using a multiple choice test with a total of 25 questions. This research involved class VIII students at SMP Negeri 1 Sawit Seberang. Data processing in this study used the SPSS version 25 application. The normality test results showed that the data came from a normal distribution. The homogeneity test shows that the data is homogeneous. In the PairdSample T-Test, the Sig value was obtained. (2-tailed) = 0.000 which indicates a significance value < 0.05 so that Ho is rejected and Ha is accepted. Thus, it can be concluded that the Discovery Learning model has a significant effect on the learning outcomes of Class VIII students on pressure material at SMP Negeri 1 Sawit Seberang.

INTRODUCTION

Education is one of the efforts chosen as a form of improving human resources (Prilliza et al., 2020). Therefore, every citizen is required to study for up to 12 years according to the government. This is based on the 1945 Constitution which states that every citizen has the right to education.

The world of education cannot be separated from the role of a teacher. According to (Maemunawati & Alif, 2020) teacher is someone who has the expertise to guide, teach, direct and assess students in the process of absorbing knowledge or insight from available learning resources. In other words, the teacher is a facilitator who provides a way for students to realize their learning vision. However, to achieve learning objectives there are problems that arise from both students and teachers themselves.

Problems that occur in the learning process in Indonesia are limited facilities and infrastructure in schools, teachers' lack of knowledge about digitalization, monotonous use of learning media, frequently changing curriculum and expensive school fees. According to (Fitri, 2021) The problems that cause the decline in the quality of education in Indonesia are weaknesses in the field of education management, the gap between educational facilities in urban and rural areas, inadequate state aid which creates poor perceptions among the population, the lack of quality of guidance resources and decreased learning assessment.

Problems in the learning process activities in the classroom were found, such as students who did not pay attention to the teacher when giving the material, students who fell asleep, who were ignorant about their themes and even those who were busy writing the lessons given by the teacher. This is a weakness in the learning process. The solution to overcome problems during classroom learning activities is to apply appropriate teaching and learning models.

The learning model contributes to the success of the learning process. The use of learning models makes learning interesting, active and creative which can improve learning outcomes. From observations that have been made, many teachers do not want to leave their comfort zone. This means that teachers continue to apply old learning models and are reluctant to try new things with varied learning models.

According to (Rambe et al., 2022) this conventional teaching and learning model tends to simply listen carefully, take notes and try to answer the problems given by the teacher which have previously been explained. This is in line with (Millah et al., 2023), namely that the conventional model is a learning model that focuses on the teacher, where the teacher leads learning meetings, starting with problem solving and problem thinking. This is clarified by the opinion of (Asmedy, 2021) The conventional learning model is a model that emphasizes teaching methods where educators play a more active role then students only pay attention and tend to be passive. Students only become audiences without being included in the learning process. The basic concept of the conventional model refers to learning in which the teaching and learning process is carried out orally and monotonously with the subject matter still being delivered through lectures, as the term "The teaching and learning process is only centered on the teacher" (Fahrudin et al., 2021). This can be seen from the learning results of class VIII students at SMP N 1 Sawit Seberang which show that only 5 out of 26 students achieved or exceeded the KKM score of 75.

According to (Santosa et al., 2020) which states that learning models are teaching and learning activities that are selected and utilized by teachers in certain contexts based on student characteristics, the school environment, the surrounding environment and predetermined learning objectives. The learning model that makes students active is by applying the model. Opinion (Susianti, 2022) *Discovery learning* is one of the models that is often used to encourage communication between students and teachers. In line with (Alfriani et al., 2022) where this model encourages students to gain their own knowledge while still receiving direction and observation from the teacher. The student's next task is to search, research and draw conclusions from the results of the student's observations to be used as a basis for answering the teacher's questions. The advantages of are that it helps students develop and strengthen students' abilities and encourages

students to be responsible in learning so that they gain the confidence to convey the ideas or thoughts they get (Mukaramah et al., 2020). According to (Artawan et al., 2020) The use of the Discovery learning learning model makes students more independent in searching for material so they can master the material and achieve learning goals. Therefore, the application of *Discovery leaning* provides opportunities for students to explore their own knowledge through a number of learning activities such as observing experiments and then drawing conclusions (Anisa, 2021).

The model is suitable for applying to Natural Science lessons. According to (Yunus et al., 2019) Natural Sciences is expected to provide a means for students to understand themselves and even the natural surroundings or perfect something they have acquired and develop it to apply it to everyday life. Learning that was initially passive will become active through the application of the learning model. This model makes him active in learning and taking part in the learning process. This makes students enthusiastic about learning by trying new things to be more active in expressing the opinions that students get from the learning process. The stages for applying the *Discovery learning* model according to (Sugo et al., 2021) are Providing Stimulation, Problem statement, Data collection, Data processing, Verfication, and Generalization.

Pressure is material studied in science learning. The concept of pressure can be understood through practical activities so that in the process of learning activities the model can be applied. The application of this model encourages students to participate in the learning process. According to (Ismawati et al., 2022) is suitable for use in learning that is related to life. In this model, students are directed to be able to stimulate problems given by the teacher, understand the main problem, combine data, manage data, prove and draw conclusions. It is hoped that a good application of the concept of pressure will be able to improve student learning outcomes. Another researcher who is in line with this is (Sari et al., 2021) who explains that the use of the model has an impact in supporting the learning outcomes of class VIII students regarding the respiratory system at MTs Tanjung Pinang.

Based on the problems that have been described, a model is needed that can create more effective learning which can then support student learning outcomes. So the author formulated the title "The Influence of the *Discovery Learning* Model on Student Learning Outcomes in Class VIII Pressure Material at SMP Negeri 1 Sawit Seberang".

METHODS

The approach used in this research is quantitative and the type of research is Quasy Experimental Design with a Pretest-Posttest Control Design. The population in this study is class VII students of SMP N 1 Sawit Seberang which is divided into 5 classes with a total of 14o students. The sample in this study consisted of two classes, namely class VIII C with a total of 26 students and VIII E with a total of 26 students.

This sampling used probability sampling technique. This research is divided into 2 variables, namely independent and dependent. Where the independent variable is the learning model and then the dependent variable is student learning outcomes. Data collection is to show learning outcomes through pretest or posttest questions which go through the validation stage, the number of questions used is 25 questions in multiple choice form.

RESULTS AND DISCUSSION

This research produces a picture of the information collected after the research. The information obtained is the results of the pretest and posttest from the experimental class which uses the learning model and the posttest or pretest using the conventional model. Information was collected with the aim of finding out the influence of the application of learning models on learning outcomes in class VIII pressure material at SMP Negeri 1 Sawit Seberang.

Descriptive Data Analysis

The aim of this analysis is to see a picture of the level of achievement of science learning outcomes using the *Discovery learning* and conventional models. Statistical analysis data was generated with the support of SPSS version 25 software.

Description of Pretest Results for Control Class and Experiment Class Students

The results showed that those who were good with the KKM score of 75 were 4 students and those who did not complete were 22 students. Meanwhile, the results of the pretest for the experimental class showed that the experimental class completed the KKM score of 75, namely 7 students, even those who did not complete it, namely 19. Then, descriptive statistical testing was carried out using SPSS version 25 software so that the results obtained included:

Table 1. Descriptive Statistics of Pretest Learning Results for Control Class and Experimental Class

Statistic	Pretest	
	Control Class	Experimental Class
The number of students	26	26
Number of question	25	25
Number of values	1800	1844
Median	70	72
Average	69,23	70,92
Standard deviation	5,279	5,130
Variant	27,865	26,314
Ideal value	100	100
Maxium value	80	80
Minimum value	60	60

The table above shows that class VIII of SMP Negeri 1 Sawit Seberang has a sample of 26 students. Conventional pretest data has been obtained in the control class and *Discovery learning* model in the experimental class. Based on the results obtained, namely the ideal value of 100, the maximum value obtained is 80 while the minimum value obtained is 60. Then based on the learning results obtained, students have a mean value of 69.23 with a standard deviation of 5.279 and a variance of 27.865. Apart from that, the experimental class pretest data obtained shows that the ideal value is 100, the maximum value obtained is 80 while the minimum value obtained is 60. Based on the students' learning outcomes in the pretest, the mean value obtained is 70.92 with a standard deviation of 5.130 and variance 26,314.

Description of Posttest Results for Control and Experiment Class Students

The posttest results for the control class were all completed with conditions above the KKM score, namely 75 with a total of 26 students. In the experimental class, all of them also completed the requirements above the KKM score, namely 75 with a total of 26 students. As for descriptive statistical testing with SPSS version 25, the results are:

Table 2. Descriptive Statistics of Posttest Learning Results for Control & Experiment Classes

Statistic	Posttest	
	Control Class	Experimental Class
The number of students	26	26
Number of question	25	25
Number of values	1988	2364
Median	76	92
Average	76,46	90,92
Standard deviation	6,230	5,130
Variant	38,818	26,314
Ideal value	100	100
Maxium value	88	100
Minimum value	60	80

From the table above, it shows that class VIII of SMP Negeri 1 Sawit Seberang has a sample of 26 students. Posttest data has been obtained using the conventional learning model in the control class and the   model in the experimental class. Based on the learning outcome scores obtained in the posttest of control class students with an ideal score of 100, the maximum score obtained by

students was 88 while the minimum score obtained by students was 60. Then, based on the learning results obtained by students, the mean was 76.46, with a standard deviation of 6.230 and variance 38,818. Apart from that, the experimental class posttest data obtained showed that the ideal score was 100, the maximum score obtained by students was 100 while the minimum score obtained by students was 80. Then, based on the learning results obtained by students in the posttest, the mean obtained was 90.92 with a standard deviation of 5.130 and a variance of 26.314.

The increase in the mean value of the posttest and pretest learning results after experimenting with the learning model in the experimental class was a difference of 20. Meanwhile, the increase in the mean value in the posttest and pretest learning results after

conducting the experiment with the conventional model in the control class was a difference of 7.23.

Test Data Requirements

Normality Test

The purpose of this test is to find information about the data being studied which comes from the population in the study which is normally distributed or not. Because the sample used in this research was only 26 students, the normality test used in this study was Shapiro-Wilk using SPSS version 25 software. Based on (Ningsih et al., 2019) the Shapiro-Wilk type test was used in the normality test if the sample number <50. The criteria used by this tester is to know the sig score found. If the significance is <0.05 then the data obtained is not normal, whereas if the significance is >0.05 then the data obtained has a normal distribution. The results of the normality test on learning outcomes are shown in this table:

Table 3. Normality Test Results

Class		Normality test		
		Shapiro- Wilk		
		Statistics	Df	Sig.
Results	Pretest A (Class Control)	,934	26	,094
	Posttest A (Class Control)	,943	26	,160
	Pretest B (Class Experiment)	,941	26	,142
	Posttest B (Class Experiment)	,941	26	,142

Based on the Shapiro-Wilk normality test, it is known that the pretest and posttest results of students in the experimental or control class are Sig. o.094>0.05 pretest of students in the control class, Sig. 0.160>0.05 posttest control class students, Sig. 0.142>0.05 pretest of students in the experimental class, Sig. 0.142>0.05 posttest for experimental class students. It can be concluded

that the data originates from a normal distribution.

Homogeneity Test

This test is used after the data results can be normally distributed. The homogeneity test was measured with a significant value of 5% (α = 0.05). The homogeneity test criteria are: if the average significant value (sig) based on mean is > 0.05 so the data is considered homogeneous.

Table 4. Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
Results Study	"Based on Mean"	,284	3	100	,837
	"Based on Median"	,416	3	100	,742
	"Based on Median and with adjusted df"	,416	3	96,817	,742
	"Based on trimmed mean"	,306	3	100	,821

According to the table above, namely the sig figure Based on Mean 0.837>0.05, the data in this

study is said to be homogeneous so the data will be tested through the Paired Sample T-test.

Hypothesis testing

After carrying out the normality and homogeneity testing process, the next step is testing the hypothesis. if sig.(2-tailed) <0.05, then Ho is rejected. Ha is accepted.

Table 5. Paired Sample T-Test Results

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hasil_belajar	Equal variances assumed	,553	,460	9,137	50	,000	14,462	1,583	11,282	17,641
	Equal variances not assumed			9,137	48,223	,000	14,462	1,583	11,280	17,643

In the Paired Sample T-Test test results above, a score of Sig.(2-tailed)=0.000<0.05 was obtained. The same as the test criteria, if the Sig score (2-tailed) <0.05 Ho is rejected and Ha is accepted. So, it can be concluded that Ho is rejected and Ha is accepted and it is stated that there is an influence on learning outcomes guided by the model.

N-Gain Test

In looking at the N-Gain value between the control class which applies the old model and the experimental class with the model, it can be found in the table below:

Table 6. N-Gain Score Value of Control Class and Experimental Class

No	Class Control N-Gain Score %	No	Class Experiment N-Gaind Score(%)
1	28,57	1	71,43
2	25,00	2	71,43
3	20,00	3	62,50
4	28,57	4	55,56
5	,00	5	55,56
6	22,22	6	50,00
7	25,00	7	55,56
8	,00	8	83,33
9	22,22	9	100,00
10	20,00	10	71,43
11	25,00	11	71,43
12	,00	12	55,56
13	33,33	13	62,50
14	28,57	14	71,43
15	33,33	15	83,33
16	25,00	16	83,33
17	28,57	17	71,43

18	25,00	18	62,50
19	28,57	19	71,43
20	28,57	20	71,43
21	22,22	21	62,50
22	25,00	22	71,43
23	33,33	23	100,00
24	40,00	24	83,33
25	28,57	25	62,50
26	28,57	26	83,33
N-Gain %	24,0476	N-Gain %	70,9325
N-Gain	0,24	N-Gain	0,70

Based on the N-Gain table above, the N-Gain score is 0.70, according to the N-Gain type, if the N-Gain value is > 0.7 then you get a medium score. It can be concluded that the increase in student learning outcomes for implementing the *Discovery learning* model is in the category currently.

From the N-Gain table, the N-Gain score percent = 70% is also produced in accordance with the N-Gain Effectiveness Interpretation category where a value of 56-75 is interpreted as relatively good in increasing student learning outcomes so that it can be concluded that the increase in learning outcomes with the *Discovery learning* model is in the sufficient category effective.

Discussion

This research was carried out at SMP N 1 Sawit Seberang. This is carried out for 4 weeks with a time allocation of 1 week 5 JP. In the first meeting, the control and experimental classes were instructed to work on multiple choice pretest questions with 25 questions, with the aim of measuring student learning outcomes before treatment, then, after working on the pretest questions, students were given different treatment in their learning. At the 4th meeting, students worked on posttest questions to measure the influence on students' understanding of learning which was known from student learning outcomes.

Based on the results, namely the learning results of class VIII E experimental class students who applied the *Discovery learning* model to pressure material, the posttest results obtained a mean score of 90.92. Then in class VIII C, in the control class, learning results were obtained with the posttest mean score being 85.38. This proves that classes that apply the *Discovery learning* model are superior to classes that use the conventional model.

When the learning process occurs, the Disovery learning learning model is learning that actively involves students in the learning process. According to (Salmi, 2019) Discovery leaning is a teaching and learning process that requires students to be actively involved in discovering ideas or principles that they do not yet understand where the material presented is not explained completely. This opinion is in line with (Ayuni & Duharman, 2022) the model, which is one of the teaching and learning models that helps students to learn independently by focusing on activeness by finding main ideas in solving a problem. If the learning model applied is appropriate, then student learning outcomes will increase.

From the previous data analysis, normality tests have been carried out through testing using Shapiro-Wilk and homogeneity tests using Levane Statistics, it was found that both have a normal and homogeneous distribution. Next, a hypothesis test was carried out using an independent sample t test which showed that the experimental class got a Sig score. (2-tailed) = 0.000<0.05 Ho is rejected and Ha is accepted. It can be concluded that the *Discovery learning* model has an influence on student learning outcomes in class VIII pressure lessons at SMP Negeri 1 Sawit Seberang.

CONCLUSION

Based on research from data processing that has been carried out, conclusions can be drawn from learning outcomes in the experimental class applied to the Discovery leaning learning model which produces a relatively high average score when compared to the average score of the

control class applied to the conventional model. This can also be seen from the results of hypothesis analysis through the paired sample t-test, there is an influence in the application of the *Discovery learning* model on the learning outcomes of class VIII students at SMP N 1 Sawit Seberang on pressure material with the results of data obtained from hypothesis testing using the paired sample t-test test obtained p = 0.000< a=0.005. So it can be concluded that there is an influence on student learning outcomes by applying the Discovery leaning model to pressure material.

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