The Influence of the Discovery Learning Model on the Learning Outcomes of Human Blood Circulation Material for Class V Elementary School Students

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Abstract

This research was motivated by the low student learning outcomes in the subject of human blood circulation, as based on the results of the daily assessment of class V students at UPT SDN 163 Gresik which showed that there were still many students who did not reach the KKM target. The purpose of this study was to determine the effect of Discovery Learning model on the learning outcomes of human blood circulation material for fifth grade elementary school students. Discovery Learning model was picked because can make learning active by making students find out and explore their own knowledge. The approach used is quantitative experiment. The type of this research is Quasi Experimental using the Nonequivalent Posttest Only Control Design. Population is students of class V UPT SDN 163 Gresik. Using a purposive sampling technique, a sample of VA and VB grade students was obtained. The technique to collect information is learning achievement test as 15 questions and the material of human blood circulation. To analyze data using SPSS 25, the posttest mean value of experimental class is superior of the control class. Based on the acquisition of the t-test on the independent sample T test, value of Sig.(2-tailed) was 0.000<0.05, meaning that H0 is rejected while H1 is accepted, so it can be concluded that there is impact of use Discovery Learning model on learning result about human blood circulation of class V students at UPT SDN 163 Gresik.

Keywords: Learning Result, Discovery Learning Model, Human Blood Circulation.

Abstrak

Penelitian ini dilatarbelakangi oleh rendahnya hasil belajar siswa pada materi peredaran darah manusia, sebagaimana berdasarkan hasil penilaian harian siswa kelas V UPT SDN 163 Gresik yang menunjukkan masih terdapat banyak siswa tidak mencapai target KKM. Adapun tujuan dari penelitian ini adalah untuk mengetahui pengaruh model *Discovery Learning* terhadap hasil belajar materi peredaran darah manusia siswa kelas V SD. Model *Discovery Learning* dipilih karena mampu membuat pembelajaran menjadi aktif dengan membuat siswa mencari tahu dan menggali pengetahuannya sendiri. Pendekatan yang digunakan adalah kuantitatif eksperimen. Adapun Jenis penelitian ini adalah *Quasi Experimental* memakai bentuk *Nonequivalent Posttest Only Control Design*. Populasinya merupakan siswa kelas V UPT SDN 163 Gresik. Melalui teknik *purposive sampling* didapat sampel siswa kelas VA dan VB. Metode yang dipakai untuk menghimpun data yaitu tes hasil belajar sebanyak 15 soal mengenai materi peredaran darah manusia. Untuk menganalisis data dibantu SPSS 25, diketahui nilai rata-rata *posttest* dari kelas eksperimen unggul dibanding kelas kontrol. Berlandaskan perolehan uji-t pada *independent sample T test*, didapat nilai Sig. (2-tailed) 0,000<0,05, artinya H_0 ditolak sedangkan H_1 diterima, sehingga didapat simpulan bahwa ada pengaruh model *Discovery Learning* terhadap hasil belajar materi peredaran darah manusia siswa kelas V SD di UPT SDN 163 Gresik.

Kata Kunci: Hasil Belajar, Model *Discovery Learning*, Peredaran Darah Manusia.

INTRODUCTION

Science is one of the lessons that students receive from elementary school to high school. As statedSihaloho et al., (2022)which is written in Minister of Education and Culture Regulation Number 58 of 2014. Science is a field that discusses the universe. Through opinionHezbollah & Selvi (2018: 1-3)Basically, it is known that science is insight into the universe in the form of truth, design, foundations and valid rules, so when studying science you have to go through the act of exploring in a structured way, the impact of which will be to understand and also experience the process of discovery. So learning science is not just about understanding concepts and facts, but also the process of obtaining them. According toYeni et al., (2020)Science trains people to have more critical and factual thinking, and helps shape students' overall personalities, according to PunNugraha et al., (2020: 82) Science can be used as a means of learning about oneself, the environment and its application to our daily lives. From this statement it can be concluded that science is important to learn so it must be implemented well so that the learning objectives can be achieved.

Through the learning outcomes obtained by students, teachers can see the achievement of learning objectives. Wahyuningsih (2020: 65) interprets learning outcomes as a person's achievements that can be seen before or after participating in learning activities which include cognitive, affective and psychomotor aspects and are expressed through numbers or something that can describe the ability and quality of the learning process. In line with what was quoted bySupriyadi (2018: 14) In Bloom's opinion, learning outcomes have three scopes, namely cognitive, affective and psychomotor.

It cannot be denied that current conditions are inversely proportional to what was desired. The majority of students have low learning outcomes, as can be seen from the daily assessment data for class V students at UPT SDN 163 Gresik, of which only 42% passed the Minimum Completeness Criteria (KKM), while 58% were declared not to have achieved the KKM target. The KKM that has been determined is 75. This is due to a lack of understanding regarding human blood circulation. As in the study that has been carried outSihaloho et al., (2022)who found that the findings related to understanding the blood circulation material for class V at SD Negeri 101816 Pancur Batu were classified as poor, as the test results had an average of 60.83 with low criteria. Apart from that, it can also be seen based on data from the 2018 PISA study at the OECD quoted bySutrisna (2021), Indonesia is at number 70/78 participants. Indonesia's average is 396 while PISA is 500 so Indonesia's scientific literacy is low.

This problem arises from several causes, including because the teacher's learning only takes the form of lectures. In accordanceHasanah et al., (2018) which states that teachers teaching science tend to use the lecture method. The students' task is only to listen to what the teacher explains, therefore, students are less involved. This makes students' interest in learning low and ultimately influences the students' learning outcomes to be low. As per the study carried outVariani & Agung (2020) Based on the results of his observations at SD Gugus II, Buleleng District, it was found that the causes of low science learning outcomes were a lack of teacher preparation and creativity to make learning fun,

as well as implementation that did not involve student activity because students tended not to be directly involved in solving problems.

The success of a learning process is certainly also influenced by the role of the teacher. Teachers are expected to be able to make learning more inclusive of students' active involvement and also interesting. As statedFanny et al., (2022) that teachers must be creative in making learning activities capable of enabling students to learn independently and not be boring. This can be done through the use of appropriate learning methods and media. AsBahari et al., (2018)which states that the teacher as a facilitator has an important position to create an encouraging learning atmosphere and includes the active role of students so that it has a good impact on student learning outcomes.

Based on the problems as previously stated, a harmonious solution is needed. Applying a learning model can be an option in overcoming existing problems. Learning models play a crucial role in the quality of the teaching and learning process. As explainedOctavia (2020: 13)regarding the learning model, namely an orderly structure to create learning activities that are good, smooth, enjoyable, easy to understand, and have a clear sequence, so that the targets or objectives of a predetermined learning can be achieved as well as possible. As statedPonidi et al., (2021: 10) The learning model is used as a reference for carrying out learning. Of the many learning models, in this research the Discovery Learning model was tried to be applied as an effort to overcome existing problems.

The use of the Discovery Learning Model is able to make students think in real time and find information for themselves related to the material they are studying. As shown byHosnan (2014: 282) which revealed that the Discovery Learning model fosters an active learning system through the activity of obtaining and carrying out independent searches, so that students will obtain more memorable results, and students will practice making deep assumptions and try to solve problems independently. As perJuliana (2018: 22) In this Discovery Learning model, the teacher does not provide the material in its entirety, but requires students to take an active role in organizing and exploring their own

knowledge. In its application, the Discovery Learning model has 6 syntax, as explained byPanggabean et al., (2021: 36-37)The 6 syntaxes are providing stimulation, identifying problems, collecting data, processing data, proving, drawing conclusions.

The Discovery Learning Model was chosen to be applied because it suited the nature of science lessons which require students to learn by exploring existing concepts. Aligned withFitriana et al., (2022)which states that the science learning process should not only remember or memorize, students need to understand concepts and make solutions to real problems.

Based on the discussion that has been presented, the author is encouraged to carry out research related to the influence of applying the Discovery Learning model. The hope is that it can make students understand more quickly so that ultimately it can improve the learning outcomes that students get. Thus, research with the title "The Influence of the Discovery Learning Model on Learning Outcomes on Human Blood Circulation Material for Class V Elementary School Students" was carried out.

METHOD

The approach used in the research is quantitative. Using experimental methods. The type of research is Quasi Experimental because the subjects of the sample members are taken from pre-existing classes, so the researcher cannot randomize students within classes. This Quasi Experiment uses a Nonequivalent Posttest Only Control Design. Here there is a group where treatment (X) is applied and another group is not. So, here is the design of this research:

$$
\begin{array}{ccc}
R1 & X & O_1 \\
\\
R2 & & O_2
\end{array}
$$
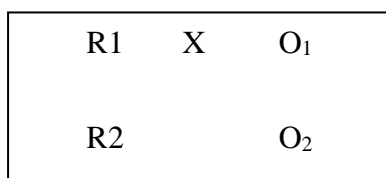
Picture1. Research design

Information:
R1   : Class Experiment
R2   : Control Class
X   : The act of using a model*Discovery Learning*

O1   : Earnings*Posttest*Experimental Class
O2   : Earnings*Posttest*Control Class

The population used is directed at all class V students of UPT SDN 163 Gresik in 2022/2023. Sample selection was carried out using purposive sampling technique. This technique selects samples for separate reasons determined by the researcher. The review to determine the sample carried out was intended to compare, so that classes were selected based on almost equal cognitive levels. So the research sample was obtained consisting of 24 class VA students in the control class and 23 class V students in the experimental class.

The research instrument used in this research is a test sheet on student learning outcomes in the form of a posttest, which is used to weigh learning outcomes on the cognitive aspects of class V students regarding human blood circulation in science learning Theme 4 Subtheme 1 learning 1. The test sheet used is in the form of objective questions. and subjective, which contains 10 questions in the form of multiple choices and 5 questions in the form of essays. To collect data, the collection technique used is by testing.

Decision making is carried out by analyzing existing data by testing hypotheses using the t-test. Before that, prerequisite tests which include normality tests and homogeneity tests are mandatory. Students' posttest scores will be analyzed using SPSS version 25.

RESULTS AND DISCUSSION

The results of the data obtained at UPT SDN 163 Gresik were then analyzed to determine the results and discussion of the research. The data used is data obtained through test scores, namely the posttest from the two classes studied. The posttest questions used were 15 questions. The following is a recapitulation data table of the posttest scores obtained by students from the two classes studied:

Table1. Recapitulation of Student Learning Results

	Kelas eksperimen	Kelas kontrol
Jumlah Siswa	23	24
Nilai Terendah	69	60
Nilai Tertinggi	96	90
Rata-Rata	86,57	75,67

Based on the posttest scores, it is known that the lowest score for the experimental class of 23 students was 69, while the highest score was 96, for an average score of 86.57. For the control class of 24 students, it is known that the lowest posttest score was 60, while the highest score was 90 and an average of 75.67 was obtained. From the information on the posttest results, which are based on average results, it can be seen that the posttest from the experimental class obtained superior results.

From the students' achievements in the posttest that has been carried out, it is then used to carry out the next test, namely the prerequisite test, which includes a normality test and a homogeneity test. Carrying out normality testing is intended to show whether data distribution is normal or not. This normality test uses the Shapiro Wilk test in SPSS version 25. The decision making criteria are based on significant values, namely the data is normally distributed when Sig. > 0.05. To see the results, see table 2 below.

Table2. Normality Test Results

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar Siswa	Kelas Kontrol (Kelas A)	,127	24	,200[*]	,960	24	,445
	Kelas Eksperimen (Kelas B)	,119	23	,200[*]	,939	23	,175

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

It can be seen that the results of the Shapiro-Wilk column normality test obtained a significant value for the control class of 0.445 > 0.05. Likewise, the experimental class has Sig. 0.175 > 0.05. Because both have Sig. > 0.05, then it can be said that the data is normally distributed. After carrying out the normality test, the next homogeneity test can be carried out.

The homogeneity value is obtained from the Homogeneity of Variance test. The homogeneity test is intended to be able to see whether the posttest results of the two classes under study are homogeneous or not. In its implementation, it uses the SPSS version 25 application. As a guideline for making decisions on this test, it is seen from the significance value, if the two variants are homogeneous it will show a Sig

value > 0.05. Table 3 below shows the results of the homogeneity test for the two classes.

Table3. Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Hasil Belajar Siswa	Based on Mean	1,461	1	45	,233
	Based on Median	1,391	1	45	,244
	Based on Median and with adjusted df	1,391	1	44,808	,244
	Based on trimmed mean	1,464	1	45	,233

Based on the Levence test in table 3, it was found that the results of the homogeneity test had significant posttest data for both classes at Based on Mean 0.233 > 0.05, thus leading to the conclusion that the data from the two samples studied were homogeneous and then hypothesis testing could be carried out.

Once it is known that the data meets the requirements, namely normally distributed and homogeneous, thus the calculation can be continued using hypothesis testing or t-test which is also carried out using SPSS version 25. The statistical method used in this research is parametric statistics, namely the Independent Sample T Test. This test is a test of the differences between two methods for two unpaired indices or averages. What is meant here is the difference in posttest scores from the control and experimental classes in terms of the average. With this test, you can determine whether the hypothesis is true or false. The criterion for making a decision is if the Sig. (2-tailed) > 0.05 indicates rejection of H1 and acceptance of H0, and vice versa.

Table4. Hypothesis Test Results

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil Belajar Siswa	Equal variances assumed	1,461	,233	-4,777	45	,000	-10,899	2,281	-15,494	-6,303
	Equal variances not assumed			-4,793	44,407	,000	-10,899	2,274	-15,480	-6,318

It can be seen from the results of the Independent Sample T Test in table 4 that it gets a Sig value. (2-tailed) 0.000 < 0.05, indicating that H0 is rejected and H1 is accepted, which leads to the conclusion that the independent

variable (Discovery Learning) has an influence on the dependent variable (learning outcomes).

The learning outcomes achieved by the experimental class were clearly superior to the control class, as evidenced by their posttest results. Learning outcomes are scores obtained by students which reflect the student's success in achieving learning objectives. As perNuridayanti (2022: 29)Learning outcomes are students' achievements after undergoing a series of learning activities, the results are usually realized in the form of grades that represent the level of learning success. The application of the Discovery Learning model has a great influence on the class atmosphere which becomes more active so that it becomes a factor that also has an effect on the superior learning outcomes of the experimental class. Same opinionHosnan (2014: 282)provides an explanation, namely that the Discovery Learning model fosters an active learning system through activities of obtaining and carrying out independent searches, so that in the end you will get results that will be better remembered.

By applying the Discovery Learning model to teaching and learning activities, it certainly helps learning activities to run well. As perFadriati (2017)There are advantages to implementing the Discovery Learning model, including being able to encourage improvements in students' cognitive skills and mechanisms, making students actively involved in learning, gaining deeper knowledge, and increasing the quality of students' problem solving. In line with opinionsHosnan (2014: 287-288)who also explained the benefits of the Discovery Learning model, including growing cognitive abilities and solving problems, also because students participate more in their learning activities, the application of the Discovery Learning model makes learning more meaningful. Furthermore, students will remember the material they study better, learn more to solve existing problems, and strengthen students' identity because they gain confidence in working with other people.

The results of this research, as described above, are in line with research findings fromVariani & Agung (2020)with the title "Discovery Learning Learning Model Assisted by Mind Mapping Media on Science Learning

Outcomes for Class V Students". From the results of the t-test, it was found that the results of t were above ttable, namely 2.3 > 2.02. So we came to the conclusion that the application of the Discovery Learning model combined with mind mapping media was proven to have an influence on the acquisition of science learning.

Then, the findingsOlii & Rizki Pautina (2020)with the title "The Influence of the Discovery Learning Method on Science Learning Outcomes on the Cycle of Living Creatures". Based on the t-test carried out, it was found that tcount exceeded ttable, thus leading to the conclusion that Discovery Learning applied to science lessons had an influence on student learning outcomes.

Based on the description above, it can be stated that there is an influence of the Discovery Learning model on the learning outcomes of human blood circulation material for class V students at UPT SDN 163 Gresik.

CONCLUSION

Based on the research results obtained and to provide responses to the existing problem formulation, based on the findings of the hypothesis test carried out through the t-test, namely by testing the Independent Sample T-Test which was applied to the posttest scores of the experimental and control classes, we came to the conclusion that there is an influence Discovery Learning model on the learning outcomes of human blood circulation material for class V UPT SDN 163 Gresik students.

SUGGESTION

From this research, the suggestions given by the author are:
1. It is hoped that the Discovery Learning model can be an option that teachers can choose to apply in teaching.
2. Students are expected to coordinate better to connect more optimally.
3. Other researchers can add more references to obtain more optimal findings.

THANK-YOU NOTE

Praise be to the presence of Allah SWT because through His grace, the author was able to complete the article entitled "The Influence of

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