

The Effectiveness of the Discovery Learning Model on Student Learning Outcomes



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ABSTRACT: Discovery learning directs students to discover something through their learning process. Learning becomes active when students use their thoughts and actions during the learning process. This study aims to determine the effect of discovery learning model on student learning outcomes. This type of research is an experimental study using posttest only control design. Data collection techniques in the form of tests using question instruments, then data analysis using prerequisite tests, namely homogeneity test, normality test and hypothesis testing. The results showed that learning by using discovery learning can significantly improve student learning outcomes and can significantly improve student activeness.

INTRODUCTION

The current learning model paradigm is student-centred. This concept is expected so that students become more active, independent, responsible and have the initiative in recognising their learning needs, and are expected to present them based on their needs. This is in line with Trinova (2013) that students have an important role in the concept of student centered learning, namely 1) students are responsible for the learning process, 2) students learn independently, 3) students take the initiative to seek and find an appropriate construction and understanding of the material they learn. It is expected that educators can direct students to meaningful learning activities through learning activities by providing opportunities for students to experience their own learning experiences (Naibaho, 2021). Thus, educators are expected to be able to create creative and innovative learning in order to accommodate students' learning needs. Various creative and innovative breakthroughs from educators are made in an effort to improve the quality of learning.

The role of the teacher is very important in improving the effectiveness of student learning. The effectiveness of student learning is the level of goal achievement, in the form of increased knowledge, skills and attitude development through the learning process (Faturahman, 2004). This is reflected in various efforts, actions systematically to achieve the expected goals. To achieve the expected goals, one of the important roles of the teacher is as a facilitator in the learning process. As a facilitator, the teacher is in charge of guiding, helping, directing, facilitating learning activities and motivating students. This is in line with Jones' (2007) opinion that the role of the teacher is to help and encourage students to have some skills, as well as being a source of information and knowledge'. This can develop active, creative student learning through their own learning experiences which can lead to critical thinking. The facilitator should allow students to determine their learning needs and goals through the utilisation of various resources, conduct discussions and provide real examples and achieve them through an extensive system of techniques and methods (Condruta, B.E., 2012).

Knowles, M (1975) explains that there are seven important elements of the teacher's role as a facilitator in the learning process, namely: learning climate, planning, designing learning needs, setting learning objectives, designing learning plans and involvement in learning activities and evaluating learning outcomes. Mulyasa (2013) also stated that there are three important variables of the teacher's role as a facilitator, namely: 1) teacher actions in assisting students in the learning process are shown with a good attitude, 2) understanding of student characteristics in the learning process, 3) having competence in addressing individual student differences.

Based on the results of preliminary observations conducted in grade 4 at SDK Beo Kina, it was found that students' social studies learning outcomes were still low. The low learning outcomes are caused by several things including the low interest and activeness of students in the learning process, which is characterised by students tending to be passive by only receiving what is taught by the teacher. In addition, teachers still dominantly use lecture-heavy learning, which makes students bored and only

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listen to what is conveyed by the teacher without feeling challenged to find other information. The lessons set by the teacher tend to direct students to be skilled at doing test questions, resulting in low understanding of student concepts. The same thing was also found by previous researchers (Pandani, et al, 2021., Nurhasanah, et al (2016)., that one of the factors that cause low student learning outcomes is the teacher's tendency to use learning strategies that are dominated by lecture activities and do not actively involve students.

Based on the various problems encountered, one solution to improve student learning outcomes is to use the Discovery Learning model. This model directs students to discover something through the learning process. It is expected that students play an active role both as actors and creators of knowledge not merely as consumers. Discovery Learning includes learning models and strategies that focus on providing active and direct learning opportunities for students (Dewey, 1997., Piaget, 1945, 1973). This is reinforced by Bicknell-Holmes and Hoffman (2000) that there are three main indicators of Discovery Learning, namely 1) exploration and problem solving to create, integrate and generalise knowledge, 2) activities carried out by students are interest-based by determining the order and frequency, 3) activities carried out can encourage the integration of knowledge that already exists in students.

The Discovery learning model helps students in strengthening their self-concept to gain confidence in cooperating with their friends, understand and grasp concepts and various ideas in every lesson and encourage students to always think and try on their own initiative (Eka Fitri, 2018). Syah in Wahjudi (2015) explains that the application of discovery learning needs to pay attention to the following steps: 1) stimulus (providing stimuli). 2) Problem statement (statement or problem identification), 3) data collection, 4) data processing, 5) verification, 6) generalisation.

Some previous research results show that the use of Discovery Learning in the learning process can help develop creativity and improve student learning outcomes, including the results of research from Kadri and Rahmawati (2015), (Kristin, 2016), Widyastuti and Reinita, 2022), Fahmi and Fitria, 2020), showing that the use of the Discovery Learning learning model can increase student activeness and can significantly improve student learning outcomes. Various previous research results are more directed at elementary thematic learning and physics at the high school level, and have not led specifically to social studies learning in elementary schools. So to fill the void, the author focuses more research on the application of the Discovery learning model on social studies material about the characteristics of space and its influence on people's economic lives. This research is important to do because it has a positive contribution to the development of education, especially the development of teacher creativity and improvement of student learning outcomes.

METHODS

This type of research is an experimental study with a quantitative approach. Sugiyono (2013) explains that experimental research is a research method used to find certain treatments for others in controlled conditions. The research design used in this study was posttest only control design. The subjects in this study were all fourth grade students of SDK Beokina with a total of 40 students, which were divided into two classes, namely class A as the experimental class and class B as the control class. Data collection techniques in the form of tests using multiple choice question instruments, which were first tested through validity tests and instrument reliability tests. Furthermore, data analysis uses prerequisite tests, namely homogeneity test, normality test and hypothesis test.

RESULTS AND DISCUSSION

The following is a descriptive statistic of posttest data from research in both experimental and control classes using SPSS 16.

Table 1. Description of posttest data of Experimental and Control classes.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Post Test Eksperimen	20	52	95	78.95	11.776
Post Test Kontrol	20	42	81	63.55	10.521
Valid N (listwise)	20				

Based on this data, the next step is to analyse the data. The data tested in this study is the posttest result data. Before testing the hypothesis, what was done first was the analysis prerequisite test which included normality test and data homogeneity test using the help of SPSS 16.

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Table 2. Normality test of experimental and control data

Tests of Normality

class	Kolmogorov-Smirnov ^a		
	Statistic	Df	Sig.
Student Learning Outcomes			.200* 0.095
1	0.151	20	
2	0.179	20	

Based on the results of the above calculations, it is stated that the data is normally distributed because the significant value is more than 0.05.

Table 3. Experimental and Control class homogeneity test results.

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Student Learning Outcomes	Based on Mean	0.107	1	38	0.745

Based on the table above, it is known that the significance value of the experimental and control class student learning outcomes variable is 0.745. Because the significance value is $0.745 > 0.05$, then as the basis for decision making in the homogeneity test above, it can be concluded that the variance of learning outcomes data in the experimental and control classes is the same or homogeneous.

After testing normality and homogeneity, the next step is to determine the results of the hypothesis using the t test. The hypothesis test used data processing using the SPSS 16 application, the hypothesis proposed is:

H₀ = There is no significant effect on improving student learning outcomes by using an interactive approach

H_a = There is a significant effect on improving student learning outcomes by using the interactive approach

Table 4. Data Hypothesis Test Using t-test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Student Learning Outcomes	Equal variances assumed	0.107	0.745	4.361	38	.000	15.4	3.531	8.252	22.548
	Equal variances not assumed			4.361	37.527	.000	15.4	3.531	8.249	22.551

Based on the results of the SPSS 16 calculation above, it is known that the significant value is $0.00 < 0.05$, so H₀ is rejected and H_a is accepted or by comparing $t_{count} > t_{table}$ with the calculation of $t_{count} = 4.361$ and $t_{table} = 1.685$ at a significant level $\alpha = 0.05$ and degree df $(20+20-2=38)$, because $t_{count} = 4.361 > t_{table} = 1.685$, then the decision H₀ is rejected and H₁ is accepted, which means that there is a significant difference between student learning outcomes in classes that get learning by using an interactive approach with student learning outcomes using a conventional approach (lecture). This means that the learning outcomes in the experimental class are greater than the learning outcomes in the control class.

DISCUSSION

The results showed that the learning outcomes of students using the discovery learning model were higher than those using conventional learning. This is reinforced by the average value of learning outcomes between the experimental class and the control class is different. These learning outcomes are in line with the results of research from Kristin, F., & Rahayu, D. (2016),

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Nelvianti, et al. (2020), Paramita, et al. (2020), Rosarina, Gina, Ali Sudin, and Atep Sujana. (2016), that the application of discovery learning can improve student learning outcomes than conventional learning.

The difference in learning outcomes between the use of discovery learning and conventional learning occurs because it is supported by several activities, namely students actively get the opportunity to seek and find their own through direct experience, conduct group discussion activities that cause a sense of pleasure, because students are directly involved in the process of finding answers to existing problems and directly practising them so that the learning process is more active. Furthermore, the application of the learning process focuses on the process, not on content or results. This is done so that students get used to searching and finding solutions to what they are looking for. In addition, when the discovery process occurs, it is followed by feedback through several activities such as questions and answers and task presentations. The significant difference in learning outcomes shows the difference between discovery learning and conventional learning. The most basic differences between discovery learning and conventional learning are 1) learning is active rather than passive (Mosca & Howard, 1997), 2) learning is process-oriented rather than content-oriented, 3) feedback is required (Bonwell, 1998), 4) deeper understanding (Papert, 1998), and 5) deeper understanding (Papert, 1998). Deeper understanding (Papert, 2000).

First, the application of Discovery learning in social studies learning at SDK Beokina is able to encourage active student involvement. The active involvement is done by training students to learn to find their own information, can work together in groups, so that the level of understanding gained by students is deeper and the learning process is more effective and efficient. It can be interpreted that learning is not only interpreted as an effort to absorb what is being conveyed by the teacher or what is read but also through active search for new knowledge. In line with that, Mosca & Howard (1997) explained that students themselves have the goal of finding answers to what they are looking for and learning more from what they find. In line with this opinion, Hosnan (201) explains that discovery learning is a model to develop an active way of learning by finding it yourself, investigating it yourself, then the results obtained will be loyal and long-lasting in memory. The discovery learning model has an influence on improving student learning outcomes, students become easier to understand learning materials and are active and creative during learning activities (Safitri, et al. 2022). The results of other studies found that Discovery learning students will feel challenged to find their own knowledge and try to understand and the material they learn (Hanifah & Wasinton, 2017).

Secondly, the application of discovery learning is process-oriented. In this activity students are directed to analyse and interpret the information they encounter. This activity is done so that students are able to understand what they learn and not just give the correct answer to something that is the result of memorisation. Discovery learning can push students to a deeper level of understanding. This is in line with the research results of Maharani, et al. (2017) and Wahyudi & Siswanti (2015), that discovery learning is a learning process that focuses on students organising themselves, discovering concepts or principles that were not known before. The main emphasis of discovery learning is to place students in the mastery and application of comprehensive skills (Bonwell, 1998).

Third, feedback is the most important part in the discovery learning process. feedback is done through group discussion activities and presented in front of the class. this activity is carried out to deepen students' understanding of the material they learn. This is in accordance with the opinion of Schank & Claery, (1994) that through discovery learning, the learning process of students becomes more active, their knowledge is strengthened and deeper and becomes more permanent by discussing it with other students. This is in line with the results of research by Kumala Sari & Lesmono (2015) that discovery learning affects process skills and learning outcomes. This is reinforced by Iswati's (2015) findings that students gave positive responses during discovery learning.

CONCLUSION

Discovery learning is a learning process that activates students in developing and improving analytical skills to build a deep understanding of key concepts and interpret information. This article has reported the results of a study that focused on student performance through discovery learning, by comparing learning outcomes through the performance of students who were given the opportunity to use discovery learning (experimental class) with students who were not given the opportunity for discovery learning (control class). The results showed that the learning outcomes of the experimental class were higher than those of the control class. This result provides further support from Bicknell-Holmes and Hoffman (2000) that there are three main indicators of Discovery Learning, namely that students are able to explore and problem solve to create, integrate and generalise knowledge, and the activities carried out can encourage the integration of knowledge that already exists in students.

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