Model Influence *Discovery Learning* Regarding Students' Cognitive Learning Outcomes on Changes in Forms of Objects at Islamic Global School Malang Elementary School

Maulidia Wiyan Sumita*, Agus Wedi, Arafah Husna

State University of Malang, Jl. Semarang No. 5 Malang, East Java, Indonesia

*Author of correspondence, Email: maulidia.wiyan.2001216@students.um.ac.id

Abstract

Model *discovery learning* considered quite effective in improving student learning outcomes. The aim of this research is to find out whether there is a model influence *discovery learning* on students' cognitive learning outcomes on material changing the shape of objects at the Islamic Global School Malang Elementary School. The subjects of this research were class III at SD Islamic Global School Malang. Data collection techniques include interviews with class III teachers, observations, and post-test learning outcomes. this research is using experimental method *quasi experiment* with research design *posttest only control group*. In processing data on student learning outcomes using the Independent Sample T-Test with assistance *SPSS* 25. From the results of data processing, it was found that the Asymp.Sig (2-tailed) value was 0.020 < 0.05, which means the working hypothesis (H1) accepted. It can be concluded that there is a significant influence model *discovery learning* on students' cognitive learning outcomes on material changing the shape of objects.

Keywords: Discovery Learning Model; Cognitive Learning Outcomes

1. Introduction

The discovery learning model is considered quite effective in improving student learning outcomes as stated by (Sudjana, 2009:32) who states that the discovery learning model is an effective and efficient teaching model in building student creativity in the further learning process. (Sudjana, 2009:32) also revealed that in its application the discovery learning model can be carried out individually, in groups or classically between students and teachers and students and students which will achieve the learning goals desired by the teacher more easily and easily achieved by students.

According to experts, the discovery learning model can also provide stimulation for students to be able to think critically and encourage students to try to understand every question given by the teacher, thereby seeing the connections available in the learning material (Sudjana, 2009: 64). After observing the opinion above, the author believes that the discovery learning model is very good for collecting students' ideas or ideas based on what they have gained through reading or experience. Through the discovery learning model, students' minds will open and formulate sentences systematically using good language and can train students' own reasoning power.

The discovery learning model is a learning model that focuses on student activities in learning. Jerome Bruner sees that the discovery learning model is related to actively seeking information with effective results. Bruner (2009:23) cognitive learning leads to the discovery learning model, which is a learning model where students interact with the environment, such

as exploring, observing objects and carrying out tests. The basic idea is that students will easily remember concepts if they learn the concepts themselves through the discovery learning model. The basic assumption of this theory is that a person has experience and knowledge within himself, this knowledge and experience is arranged in cognitive form. The characteristics of cognitive flow are prioritizing the person, prioritizing the whole over parts, prioritizing cognitive roles, prioritizing current conditions, and prioritizing the formation of cognitive structures.

According to Bloom in Wahab (2013), learning outcomes in the cognitive domain involve understanding concepts, ideas, factual knowledge and intellectual skills. Often, educators focus more on assessing cognitive learning outcomes. Learning objectives in this cognitive domain are usually explained by detailed student behavior. This taxonomy of learning outcomes is cumulative and hierarchical in structure, meaning that achievement at a higher level depends on more basic understanding or skills that exist at a lower level.

In the context of cognitive processes, this taxonomy includes: Remembering (C1), namely retrieving knowledge from long-term memory, Understanding (C2): namely building meaning from material learning11, including information conveyed by the teacher either orally, in writing or visually; Applying (C3), namely using a procedure or concept in a certain situation; Analyzing (C4) is dissecting the material into part its components and identifying the relationships between those parts as well as the overall structure or purpose; Evaluating (C5), namely making decisions based on certain criteria or standards;Creating (C6) is combining various parts to form something new and cohesive or create a product original.

The understanding contained in science is vital for young elementary school students to learn as a basic understanding. This is because the essence of science is a product, process, and scientific and technological attitude that follows the increasingly rapid development of the times to bring a new era within the scope of the modern world which is closely related to science which produces advanced technologies that are very useful in life. creature life, especially humans. In this way, science subjects become essential for students to be able to understand and appreciate the material that comes later practice it in everyday life.

As reinforcement in the discussion of this research, researchers analyze a number of study previous research which is in line with this research. One of them is research conducted by Mediansyah with the title "The Effect of Implementing the HOTS-Based DL (Discovery Learning) Learning Model on Learning Outcomes in Science Subjects for Class V Students at SDN 99 Bengkulu City". This research aims to assess the impact of using the HOTS-based DL (Discovery Learning) learning model on the learning achievement of 13 fifth grade students in science subjects in elementary school. This research method uses a quantitative method using tests as instruments and collecting data through pretest and posttest in the control group and experimental group. The results of this research, which have been tested with previous theories, conclude that there is a significant influence from the application of the HOTS-based DL (Discovery Learning) learning model on student learning outcomes in class V science subjects at SDN 99 Bengkulu City, which is indicated by the significance value the posttest score was 3.83.

Researchers also conducted interviews in the context of class III students' cognitive knowledge with one of the teachers at Islamic Global School Malang Elementary School. It was found that using the discovery learning model allowed students' cognitive abilities to develop.

However, the difficulties felt by many teachers are related to differences in student characteristics, there are students who understand easily, are so-so and those who find it difficult to understand what the teacher says. Learning at Islamic Global School Malang Elementary School predominantly uses the discovery learning model in implementing the learning process in class. This discovery learning learning model is considered more effective and has a great influence on student learning development.

From the problems above, the researcher wants to know whether there is an influence of the application of the discovery learning model on students' cognitive learning outcomes in the material on changes in the form of objects at the Islamic Global School Malang Elementary School by taking the topic title "The Influence of the Discovery Learning Model on Students' Cognitive Learning Outcomes on the Material of Changes in the Form of Objects in SD Islamic Global School Malang."

2. Method

This research uses an experimental method with a quasi-experimental design. In this study, there were two class groups, namely the control group and the experimental group. The control group received general discovery learning, while the experimental group received discovery learning using a team game tournament approach.

The research design used was a posttest-only control design. The aim of this research is to assess how much influence the discovery leaning model has on students' cognitive learning outcomes in the material on changes in the shape of objects.

Experiment	R	X	O1
Control	R	X	O2

Information :

R: Experimental group and control group selected randomly

O1: Measurement results obtained from the experimental class (group that received treatment)

O2: Measurement results obtained from the control class (group that did not receive treatment)

The variable that is the object of research or that must be considered in this research is the independent variable (X) is the Discovery Learning Model and the dependent variable (Y) is Cognitive Learning Outcomes. Research subjects discuss the characteristics of the subjects used in the research, including explaining the population used, samples and sampling techniques (random/non-random) (Nanang Martono, 2010:112). The group of students who were the subjects of this research were class III students at SD Islamic Global School Malang who applied the discovery learning model in learning who were selected using cluster random sampling techniques where among the four classes, those determined as research samples were class III B as the control group. and class III C as the experimental group.

Table 1. Research Subjects

No	Class	Group	Amount	
			L	P
1	III C	Experiment	14	9
2	III B	Control	15	8

3. Results and Discussion

3.1 Result

Data analysis in the research process is research that is difficult to carry out and requires hard work, creative thinking and broad insight. Data is obtained from interviews, field notes and documentation, by organizing data into categories, describing it in units, synthesizing it, organizing it into patterns, choosing what is important and what will be studied and drawing conclusions in such a way that makes it easy. understood by oneself and others (Sugiyono: 2010). In this study, the t test analysis technique was used for student learning outcome test scores. When the learning test results have been collected, the next step is analysis using prerequisite tests first and then statistical tests.

Descriptive Analysis

Data obtained from research is processed and presented using tables according to descriptive statistical techniques. The data provided is a general explanation of the information obtained in field research.

Table 2. Descriptive Analysis Results

Descriptive Statistics

		Range	Minimum	Maximum	Mean	Std. Deviation
Post-test Eksperimen	23	47	40	87	57.35	15.628
Post-test Kontrol	23	30	33	63	47.87	10.554
Valid N (listwise)	23					

Based on the data table above, statistical data shows the values of two sample groups, namely the experimental group and the control group, each with 23 subjects. The control group had an average score of 47.87, a minimum score of 33, and a maximum score of 63, with a standard deviation of 10.554. The experimental group had an average score of 57.35, a minimum score of 40, and a maximum score of 87, with a standard deviation of 15,628. This data shows that classes that use the discovery learning model with a team game tournament approach have better average scores than classes that only use the discovery learning model.

Normality test

Based on the scores obtained from both classes, the researcher continued testing the prerequisites for data analysis by carrying out a normality test to find out whether the data was normally distributed or not. The results of the normality test obtained the following data.

Table 3. Normality Test Results

Tests of Normality

		Kolmogorov-Smirnov[a]		
	Kelas	Statistic	df	Sig.
Hasil Belajar	Kelas Eksperimen	.175	23	.067
	Kelas Kontrol	.179	23	.054

Based on the table above, it shows that the experimental class significance value obtained is 0.067. It can be seen that the significance value is greater than 0.05, so it can be concluded that the experimental class data is normally distributed. Meanwhile, the control class value was obtained with a significance value of 0.054. It can be seen that the significance value is greater than 0.05, so it can be concluded that the control class data is normally distributed. This data shows that the question instrument data is normally distributed, so hypothesis testing is carried out using the parametric Independent Samples T-test.

Homogeneity Test

Based on the significance value mentioned previously, if the significance value is > 0.05 then it can be concluded that the data has the same/homogeneous variance.

Table 4. Homogeneity Test Results

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	2.594	1	44	.114
	Based on Median	1.464	1	44	.233
	Based on Median and with adjusted df	1.464	1	32.676	.235
	Based on trimmed mean	2.403	1	44	.128

As can be seen from the table above, the significance value based on Based on Mean is 0.114. This is in accordance with previously established criteria, if the significance value based on Based on Mean is 0.114 > 0.05, then it can be concluded that the data is considered homogeneous.

Hypothesis testing

After carrying out the necessary prerequisite tests, namely the normality test and homogeneity test. Next, hypothesis testing is carried out which is tested using Independent Sample T-Test parametric statistics in the SPSS Statistics 25 program. In the Independent Sample T-Test test, the significance level is 0.05. If Sig (2-tailed) > 0.05 then H1 is rejected and The discovery learning model made no difference to students' cognitive learning outcomes in the material on changes in the shape of objects. Meanwhile, Sig (2-tailed) < 0.05 means H1 is accepted and the discovery learning model shows differences in students' cognitive learning outcomes in the material on changes in the shape of objects.

Table 5. 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	Equal variances assumed	2.594	.114	2.410	44	.020	9.478	3.932	1.553	17.403
	Equal variances not assumed			2.410	38.612	.021	9.478	3.932	1.522	17.434

Based on the table above, it shows the hypothesis accepted because Asymp.Sig (2-tailed) value is 0.020 so can be concluded that 0.020 < 0.05, then H1 is accepted, which means there is a significant difference in the application of the discovery learning model to students' cognitive learning outcomes in the material on changes in the shape of objects.

3.2 Discussion

The aim of this research is to find out whether there is an influence of the discovery learning model learning on students' cognitive learning outcomes on material changing the shape of objects at the Islamic Global School Malang Elementary School. This research involved class III B with 23 students as the control group and class III C with 23 students as the experimental class. The research method used is a quasi-experimental quantitative approach with research design posttest only control group. Researchers gave 15 valid questions as a post-test to measure students' cognitive learning outcomes the calculation results the control group average was 47.87 and in the experimental group the average was 57.35. Based on the description of the research results and hypothesis testing carried out, it shows that learning using the discovery learning model makes a difference to students' cognitive learning outcomes in the material on changes in the shape of objects at SD Islamic Global School Malang.

This can be seen in the results of the Independent Sample T-Test, the significance value is 0.020 <0.05, which shows that H1 is accepted.

Learning takes place in experimental and classroom classes control is based in the learning implementation plan (RPP) which has been previously designed and implemented in two meetings. The learning process that takes place in the experimental class and control class is generally the same. The difference lies in the experimental class using a discovery learning learning model with a team game tournament approach in implementing learning, while the control class only uses a discovery learning model.

The first step in starting research in the experimental class is that the teacher first divides the students into three groups consisting of seven students each. The teacher shows pictures of events changing the shape of objects. Students carefully observe the image of the change in shape of an object displayed via the LCD projector and are given one minute to discuss with the group and immediately paste the correct answer in the space provided. Next the teacher concludes and evaluate answers correct. The group of students who gave all the answers quickly and correctly get the most stars awarded.

In the control class, students were also divided into four groups of six students each. Students experiment with making ice cream Before Doing experiment, students observe a video shown regarding changes in the shape of objects. Students carry out experiments according to the instructions in the Student Book. Previously, students were assigned to bring the objects used in the experiment. After that, students write the results of their observations in the Student Book. Students present the results of their experiments in front of the class.

After learning, students are given post-test questions in class control and experimental class. The post-test results show that learning outcomes which is achieved by students on change material. The shape of objects in the two classes can be seen as different. This shows that the discovery learning model has a significant influence on students' cognitive learning outcomes in the material on changes in the shape of objects.

Based on the results of the normality and homogeneity tests for the two groups, it can be concluded that the data for the two groups show that distributed data normal and homogeneous. Next, carry out a parametric statistical test, namely the Independent Sample T-test for hypothesis testing. The results of the hypothesis test formulated using SPSS 25 produced an Asymp.Sig (2-tailed) value of 0.020. There are calculation criteria, namely the Asymp.Sig (2-tailed) value < 0.05, then H1 is accepted. Because the Asymp.Sig (2-tailed) value is less than 0.05, H1 is accepted, which means there is a significant influence on the discovery model. learning towards students' cognitive learning outcomes on material changing the shape of objects.

The results of this research are in line with research conducted by Mediansyah which concluded that there is a significant influence from implementing the HOTS-based DL (Discovery Learning) learning model on learning outcomes students in class V science subjects at SDN 99 Bengkulu City, which is indicated by a significance value in the posttest score of 3.83. Likewise, research conducted by Firosalia Kristin found that the application of the discovery learning model had a positive impact on student learning outcomes and showed that students who took part in the experimental class obtained a higher average score than students in the control class. The average score of experimental class students was 82.08, while the average

score of control class students was 70.22. These results confirm that the use of the discovery learning model has a significant influence on the science learning outcomes of grade 4 students at SD Negeri Koripan 01.

4. Conclusion

Based on the results of the research explained in the previous chapter, it can be concluded that the application of the discovery learning model has a significant difference to students' cognitive learning outcomes in the material on changes in the shape of objects at the Islamic Global School Malang Elementary School which obtained post-test results in class III B as the control group. -The average score is 47.87 and in class III C as the experimental group the average score is 57.35. Independent Sample T-Test which obtained an Asymp.Sig (2-tailed) value of 0.020 so it can be concluded that 0.020 < 0.05, then H1 is accepted, which means there is a significant difference in the application of the discovery learning model to students' cognitive learning outcomes in changing material. object form.

Based on the research results above, it shows that the experimental class that uses the discovery learning model with a team game tournament approach is higher than the class control that only using the discovery learning model. Thus, it can be concluded that there are differences in the application of the discovery learning model to students' cognitive learning outcomes in the material on changes in the shape of objects at the Islamic Global School Malang Elementary School.

References

Abdi, Husnul. 2023. *"Pengertian Observasi Menurut Para Ahli, Ciri-Ciri, Jenis, dan Tujuannya".* Jakarta: Liputan6. https://www.liputan6.com/hot/read/5294168/pengertian-observasi- menurut-paraahli-ciri-ciri-jenis-dan-tujuannya?page=4

Aris. 2022. *"Pengertian Populasi: Karakteristik dan Faktor yang Mempengaruhi"* Jakarta: Gramedia Blog. https://www.gramedia.com/literasi/stratifikasi-sosial/

Burta, Florina Simona. 2018. *"Pengaruh Model Pembelajaran Discovery Terhadap Hasil Belajar Ipa Kelas V Min Sei Agul Kota Medan."* (1): 430–39.

Danisa, Debora. 2022. *"Pengertian Instrumen Penelitian, Jenis, dan Contohnya".*Jakarta: detik jabar. https://www.detik.com/jabar/berita/d6230758/pengertian-instrumen-

penelitian-jenis-dan-contohnya

Nusa, Great. 2023. *"Pengertian Analisis Data Menurut Para Ahli dan Jenisnya".* Jakarta: Great usa. https://greatnusa.com/artikel/pengertian-analisis-data- menurut-para-ahli2/

Payosi, Ade. 2020. Skripsi *Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Pendidikan Kewarganegaraan Siswa Kelas IV Sekolah Dasar Negeri 14 Bermani Ilir Kabupaten Kepahiang.*

Rachman, Tahar. 2018. *"Pengaruh Model Pembelajaran Penemuan (Discovery Learning) Terhadap Hasil Belajar Ipa Bagian-Bagian Tumbuhan Peserta Didik Kelas Iv Sd Inpres Bontoramba Kab.Gowa."* Angewandte Chemie International Edition, 6(11), 951– 952.:10-27.

Rahmadhani, Mutiara. 2018. *"Pengaruh Model Discovery Learning Terhadap Hasil Belajar Kognitif Dan Kemampuan Berpikir Kreatif Siswa Kelas X Materi Elektrolit Dan Non Fakultas Sains Dan Teknologi."*

Subitmele, S. E. 2022. *"Angket Adalah Metode Pengumpulan Data, Pahami Jenis Dan Karakteristiknya".* Jakarta: Liputan6.

https://www.liputan6.com/hot/read/5161083/angket-adalah-metode- pengumpulan data pahami-jenis-dan-karakteristiknya?page=4

Therapy, Cognitive et al. 2018. *"Pengaruh penggunaan metode discovery berbasis media realita terhadap hasil belajar ipa konsep sifat dan perubahan wujud benda siswa kelas iv sdn 8 kalimbaung kecamatan bantaeng kabupaten Bantaeng skripsi."* ق ثقث ق ثق .ث ق ثق)قققث ث

:) ثق http://search.ebscohost.com/login.aspx?direct=true&db=sph&AN=119374333&site=ehostlive&scope=site%0Ahttps://doi.org/10.1016/j.neuron.2018.07.032%0Ahttp://dx.doi.org/10.1016/j.tics.2017.03.010%0Ahttps://doi.org/10.1016/j.neuron.2018.08.006.

Virda Anggraeni. 2022. *"Pengaruh Model Pembelajaran Discovery Learning Berbantu Media Live Worksheets Terhadap Hasil Belajar Kognitif Siswa Mata Pelajaran Biologi Kelas X Di Sma N 1 Punggur."* Skripsi: 1–65.

Yusuf Sukman, Jayadi. 2017. *"Pengaruh Model Pembelajaran Problem based Learning*

terhadap Hasil Belajar Siswa Kelas IV pada Mata Pelajaran ilmu Pengetahuan Sosial Di MI Mathla'ul Anwar Sindang Sari Lampung Selatan". 4: 9–15.