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The Effectiveness of Discovery Learning Models Towards Mathematics Learning Achievements of Elementary Students

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Abstract
The low mathematics learning achievement of fifth grade elementary school students in the Sultan Fatah Group, Demak District, is because the learning that has been done so far has been less innovative, making students trapped in routines, memorizing a lot, learning media is lacking, so students do not know the meaning or usefulness of the material being studied.The purpose of this study was to find out Is the Discovery learning model more effective than the conventional learning model in improving elementary school students'mathematics learning achievements. This study uses a quasi-experimental research method with pre-test post-test control group design. The population in this study were fifth grade elementary school students in the Sultan Fatah Cluster, Demak District, totaling 95 students. While the sample taker uses a saturated sample technique so that all members of the population are used as samples. Data analysis used of validity test, reliability test, level of difficulty test, normality test, homogeneity test, average similarity test, paired sample T test and gain index calculation. The discovery learning model is more effective than conventional learning models in improving students' mathematics learning achievement based on a mean value of 90.0 > 61.45 and a Tcount of 12,959 > Ttable 199897 with a sig value of 0.000 < 0.05.
Keywords: *Discovery Learning, Learning Achievement*

Abstrak
Rendahnya prestasi belajar matematika siswa kelas V SD di Gugus Sultan Fatah Kabupaten Demak dikarenakan pembelajaran yang dilakukan selama ini kurang inovatif, membuat siswa terjebak dalam rutinitas, banyak menghafal, media pembelajaran kurang, sehingga siswa tidak mengetahui makna atau kegunaan dari materi yang dipelajari. Tujuan penelitian ini adalah untuk mengetahui apakah model pembelajaran Discovery Learning lebih efektif dibandingkan dengan model pembelajaran konvensional dalam meningkatkan prestasi belajar matematika siswa SD. Penelitian ini menggunakan metode penelitian eksperimen semu dengan desain pre-test post-test control group design. Populasi dalam penelitian ini adalah siswa kelas V SD di Gugus Sultan Fatah Kabupaten Demak yang berjumlah 95 siswa. Sedangkan pengambilan sampel menggunakan teknik sampel jenuh sehingga semua anggota populasi dijadikan sampel. Analisis data yang digunakan adalah uji validitas, uji reliabilitas, uji tingkat kesukaran, uji normalitas, uji homogenitas, uji kesamaan rata-rata, uji paired sample T dan perhitungan gain index. Model pembelajaran discovery learning lebih efektif dibandingkan model pembelajaran konvensional dalam meningkatkan prestasi belajar matematika siswa berdasarkan nilai mean 90,0 > 61,45 dan Thitung 12,959 > Ttabel 199897 dengan nilai sig 0,000 < 0,05.
Kata Kunci: Discovery Learning, Prestasi Belajar

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INTRODUCTION

Education is a basic need that must be met. In accordance with the goals of the progress of civilization and technology of a nation. The civilization of a nation is determined by the level of education of its citizens, so education is a benchmark for the progress of the nation. Many efforts have been made by the Indonesian government to improve the quality of education, especially mathematics, but so far the results are still far from expectations. In fact mathematics is still difficult for students to understand, this can be seen from the data on the average national exam score for elementary mathematics subjects in the 2018/2019 school year in Demak Regency is 6.03 (Demak Regency Education Office Education Subdin, 2019). Meanwhile, there are still many mathematics teachers who do learning with conventional methods so that students are not actively involved so that learning is less fun. The consequences that arise if students have difficulty and are less interested in mathematics are unsatisfactory learning achievements, so that in general the quality of education is not good at various levels of education.

Mathematics learning in elementary school conventionally shows a didactic pattern, or direct learning model. The teacher comes, presents the subject matter, explains, gives examples, exercises on questions and evaluates. Efforts to create optimal conditions and tutoring in accordance with students' abilities have not been optimal. There is a tendency that learning is always classical and the teacher creates a competitive atmosphere so that all students are enthusiastic in learning so that collaboration between students in learning to achieve goals is still lacking. In the implementation of learning mathematics is not easy, for the most part students experience difficulties in study mathematics (Ginanjar 2019; Sunaryo, Utaminingsih & Suryani, Fitri Budi, Sumaji,2022)

Recently, research and development of mathematics learning models has been rapidly developing which is driven by the weaknesses of the old mathematics learning model such as many lectures, a lot of memorization, and many assignments that have been applied and are often referred to as traditional learning. Traditional learning is still accused of being the cause of students' low mathematics learning achievement, because it makes students stuck in routines, memorizes a lot, low interest in learning, lacks learning media, relies more on low cognitive aspects, and generally students do not know the meaning or usefulness of the material being studied.

In its implementation, learning activities are held to shape the character and improve the quality of life of students. Learning activities also develop the ability to know, understand, do things, and live together. According to the SBM team (2019:14) that: "Learning activities need to be: student-centered, develop student creativity, create fun, and challenging conditions, contain values, ethics, kinesthetics, and provide diverse experiences". To achieve these things, the implementation of learning applies various strategies and learning methods that are fun, contextual, effective, efficient, and meaningful. To improve student achievement, teachers need creativity in choosing teaching methods and media used, so that they always attract students' interest and motivation to achieve learning objectives. Anita Wollfolk in Martinis (2018:1) states that teachers must have creativity, new strategies, and break away from routine when situations require change. In addition to the methods used by teachers in teaching mathematics, student learning success cannot be separated from students' interest in learning mathematics.

With the cooperative learning model, students are expected to be really active, because active learning can cause students' memories to recognize what they are learning will be longer and will lead to creative attitudes in students. Cooperative learning is a fun and student-centered learning model. The cooperative learning model is characterized by a task structure, goal structure and reward structure. In the learning

process with the cooperative learning model students are encouraged to work together on a common task and they must coordinate their efforts to complete the tasks given by the teacher. The purpose of the cooperative learning model is to increase student academic achievement and students can accept diversity from their friends, as well as develop social skills. The type of cooperative learning is discovery learning.

The Discovery learning model is student-centered learning (student central learning) where this learning model requires students to be active in learning. teaching, individual, object manipulation, and other experiments, before arriving at generalizations. Discovery Learning will make students active in expressing ideas and can help students to strengthen their learning concepts so that it can indirectly increase their confidence of students (Saptarini, D, sukirman & Santoso 2022). This will have an impact on students' metacognitive improvemen.

The Discovery Learning model provides an opportunity for students to work together in groups to solve problems given by the teacher. So that this model can stimulate the enthusiasm of students in solving problems and make the classroom atmosphere more conducive to students who take part in learning with the Discovery Learning model, especially during discussion activities and students begin to have the awareness to provide opportunities for their less able friends to join in discussion activities, even to represent the group presenting the results of the discussion (Amin, S 2021).

Students' mathematics learning achievement is decreasing, this is due to one of the reasons is the use of learning models that are less innovative, learning does not involve active participation of students and learning creativity does not occur. Therefore, it is necessary to try out a new learning model. The use of learning methods has a large enough influence on the success of students who learn and teachers who teach. With learning methods that are in accordance with the material presented by the teacher, it is hoped that it can improve student achievement.

The cooperative learning method is a form of learning based on the philosophy of constructivism, in which students actively construct their own knowledge. Students will more easily understand difficult concepts if they can discuss these problems with their friends. The learning model of discovery learning and student teams achievement divisions is a type of cooperative learning that is process oriented and group work, so that learning further enhances students' understanding of a subject matter and enhances cooperation between students. In the end, it is hoped that it can improve student learning achievement so that the use of cooperative learning methods of discovery learning type in mathematics is thought to be more effective and produce better mathematics learning achievement than conventional methods.

The purpose of this study was to find out Is the Discovery learning model more effective than the conventional learning model in improving elementary school students’mathematics learning achievements.

METHOD

This study uses a quasi-experimental or quasi-experimental research method. In this study there are one independent variables and one dependent variable. The independent variable is the discovery learning learning model as the experimental class then the conventional method as the control class. The second independent variable is students' learning achievement in mathematics.

Before being given treatment, the experimental group was first given a pretest, then given treatment using discovery learning and student teams achievement divisions learning after that was given a posttest. The following is a table of time series design in this study

Table 1. *Time Series Design*

Pre Test	Perlakuan	Post Test
O1	Eksperimen	O3
O2	control	O4

Information:
O1 : Pre-test experimental
O3 : Post-test experimental group
O2 : Pre-test control group
O4 : Post-test control group
X1 : discovery learning
X2 : conventional method.

The population is the entire object to be studied (Sulistyo-Basuki 2016: 182). The population in this study were the fifth grade students of Cabean 2 Demak State Elementary School, which amounted to 31 students and 33 students of Bango 2 State Elementary School, Demak Regency.

RESULT AND DISCUSSION

In experimental class, the posttest scores for fifth grade elementary school students' mathematics learning achievement, from 33 students there were 2 (6.1%) students in the poor category, there were 4 (12.1%) students in the fairly good category, there were 9 (27, 3%) students in the good category and 18 (54.5%) students in the very good category. Thus, the mathematics learning achievement of fifth graders at Bango 2 State Elementary School, Demak Regency, after using the discovery learning model was in the good category. In the conventional class, the posttest scores for mathematics learning achievement of fifth grade elementary school students, from 31 students there were 3 (9.7%) students in the poor category, there were 15 (48.4%) students in the fairly good category, there were 10 (32.2) students. %) students in the good category and there are 3 (9.7%) students in the very good category. Thus, the mathematics learning achievement of fifth graders at Bango 1 State Elementary School, Demak Regency using conventional methods is in the fairly good category. The posttest value of the experimental class is in the good category, while in the conventional class the posttest results are in the sufficient category. This shows that the discovery learning model is more effective than the conventional learning model towards improving the mathematics learning achievement of fifth grade elementary school students in the Sultan Fatah Cluster, Demak District.

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Table 2 Discovery Learning T Test Results with Conventional Learning

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Mathematics Learning achievement	Equal variances assumed	.009	.927	12.959	62	.000
	Equal variances not assumed			12.962	61.805	.000

Independent test sample t-test on equal variance assumed obtained a Tcount of 12,959 > T $_{table}$ 199897 and a significance level of 0.000 <0.05. These results indicate that H0 is rejected and Ha is accepted, which means that there is a difference between the discovery learning model and conventional learning in terms of the mathematics learning achievement of fifth grade elementary school students in the Sultan Fatah Group, Demak District. It can be said that students' achievement in learning mathematics with discovery learning and conventional learning is basically different.

Table 3 Discovery Learning Statistics Group with Conventional Learning

Group Statistics

	Kelas	N	Mean	Std. Deviation
Mathematics Learning achievement	Discovery learning	33	90.00	8.839
	convensional	31	61.45	8.774

The mean value of mathematics learning achievement of fifth grade elementary school students with discovery learning learning model is 90.0 while students' mathematics learning achievement with conventional learning model is 61.45. These results mean that the average mathematics learning achievement of fifth grade elementary school students using the discovery learning model is higher than the conventional learning model (90.0 > 61.45). Thus, it can be concluded that the discovery learning model is more effective in improving the mathematics learning achievement of fifth grade elementary school students compared to conventional learning.

CONCLUSION

The discovery learning model is more effective than the conventional learning model in improving the mathematics learning achievement of fifth grade elementary school students in the Sultan Fatah Cluster, Demak District. Based on the independent sample t-test test on equal variance assumed, the Tcount value was 12,959 > Ttable 199897 and a significance level of 0.000 <0.05 and the average mathematics learning achievement of fifth grade elementary school students using the discovery learning model was higher than the conventional model (90.0 > 61.45).

Based on the results of this study can be suggested to teachers should be more innovative in carrying out learning by using cooperative learning models in learning mathematics so that learning outcomes can increase. If referring to the results this research, then the learning model of discovery learning can be a reference on the teacher.

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