



The Influence of Mastery Learning Model on Mathematics Learning Outcomes of Grade III Elementary School Students

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Abstract. Mathematics learning models that are not in accordance with the characteristics and needs of students will have an impact on low learning outcomes. This study aims to determine the influence of the Mastery Learning model on the mathematics learning outcomes of grade III elementary school students. The study was conducted using quantitative experimental methods with Nonequivalent Control Group Design. The population in this study was all grade III students at SDN Gondangdia 01, while the sample was class III-B which amounted to 30 people as an experimental class and class III-A which amounted to 30 people as a control class. The data collection techniques used are observation and written tests with decision-making criteria from t-tests in analyzing data. The results showed that the experimental class experienced a greater improvement compared to the control class. The t-test shows a Sig. value of $0.001 < \alpha$ of a significant level value of 0.05 which indicates that H_0 is rejected and H_1 is accepted. From the results of the study, it can be concluded that the Mastery Learning model has a significant influence on the mathematics learning outcomes of grade III students at SDN Gondangdia 01.

Keywords: Mastery Learning Model, Learning Outcomes, Mathematics.

1 Introduction

Education plays an important role in advancing human civilization. Education is also the basis for developing an intelligent, innovative and highly competitive society. Through education, individuals are given the opportunity to acquire the ability to think systematically, logically and critically which is very necessary to face challenges in everyday life [1]. One of the keys to the importance of education in building students' logical and systematic thinking abilities is contained in mathematics learning. Learning mathematics can be a forum for students to master numerical and geometric concepts in preparing future generations to face more complex and dynamic challenges.

Learning mathematics in elementary school can be the basis for forming a basic understanding of mathematical concepts which include numeracy skills as well as logical and analytical thinking skills in solving problems. Through an interesting and innovative approach, learning mathematics can help students to be more open to new

innovative approach, learning mathematics can help students to be more open to new knowledge so they can participate actively in learning. In this way, mathematics learning can be a driving force in improving student learning outcomes.

Based on a literature review, it was found that the factors that influence learning outcomes are divided into two, namely internal factors originating from within the individual and external factors originating from the external [2]. Other research also states that the results of inappropriate teaching methods will have an impact on mathematics learning outcomes even at levels below the Minimum Completeness Criteria [3]. Low student mathematics learning outcomes occur because learning activities are still dominated by teachers, so students are less enthusiastic in the learning process [4]. This is supported by the results of observations at SD Negeri Gondangdia 01 Pagi, Menteng, Central Jakarta which show that there are still students in class III mathematics learning outcomes who have not reached the KKM. From a document study of mathematics learning results for class III-B students, it is known that out of a total of 30 students, there are 7 students who have not reached the KKM in mathematics subjects. This is based on students' lack of motivation to learn and the use of methods that are less suited to students' characteristics and needs so that students tend to be less focused and enthusiastic.

The problems that arise are greatly influenced by the role of the teacher, especially the lack of variety and creativity in teaching so that learning is only centered on the teacher without involving students. This is what causes students to often feel bored because they just sit and listen to the teacher telling stories. In learning, students become passive and lack understanding and mastery of the material which has an impact on low student learning outcomes [5].

Choosing the right learning model is very important to help students master a concept in learning Mathematics. Therefore, the application of the Mastery Learning model is considered to be able to encourage students' deep and complex understanding of mathematics learning, because this model focuses on each student achieving a strong level of understanding [6]. This is supported by research showing the results of the Mastery Learning model can help improve student learning outcomes by as much as 27% [7].

Mastery Learning is a model that emphasizes mastering a comprehensive understanding of the material being studied before moving on to the next material. The characteristic of this model is that it pays attention to the completeness of individual student learning, considering the different learning speeds of students. There are five stages in implementing the Mastery Learning model, namely 1) pre-assessment, 2) instruction, 3) formative correction or enrichment instruction, and 5) summative grading or assessment [8].

Student learning outcomes are better by using a realistic project-based learning model because it gives students the opportunity to explore to increase their insight and skills [9]. There is an influence on the application of learning models Picture and Picture make students more interested so that student learning outcomes increase by 27.79% in cycle I and cycle II [10]. The learning model has a big influence on improving student learning outcomes due to changes experienced by students [11].

Referring to previous research literature studies that link the influence of learning models on students' mathematics learning outcomes, there is still very little research that discusses the relationship between mathematics learning outcomes and Mastery Learning model. Therefore, this research links students' mathematics learning outcomes with the application of the Mastery Learning model.

2 Method

2.1 Research Approach

This research uses a Quasi Experimental quantitative approach with a research design Nonequivalent Control Group Design, where the experimental group and control group were not chosen randomly [12]

Table 1. Research design

Group	Pretest	Treatment	Posttest
Experiment	O ₁	X ₁	O ₂
Control	O ₁	X ₁	O ₂

Information:

O₁: Pretest results for experimental class and control class

O₂: Posttest results for experimental class and control class

X₁: Treatment of the experimental class using the Mastery Learning model

X₂: Treatment of the control class using a Cooperative Learning model NHT type

2.2 Population and Sample

This research was conducted at SD Negeri Gondangdia 01 Pagi which is located at HOS Cokroaminoto Street No. 66, Menteng, Central Jakarta. The population in this study was all class III students at SD Negeri Gondangdia 01 Pagi, totaling 60 students. By using purposive sampling technique to select students who have varying levels of mathematical ability, the samples in this study were class III-B, totaling 30 students as an experimental class that used a Mastery Learning model and class III-A, totaling 30 students, as a control class that uses a Cooperative Learning model NHT type.

2.3 Data Collection Technique

The Data collection techniques include observation and tests. Observations are carried out through observing and recording students' learning activities during learning. The tests are carried out to measure student learning outcomes before (pretest) and after being treated (posttest).

2.4 Validity and Reliability

Instrument tests carried out with validity and reliability tests are used as measuring tools in research that are used to assess the accuracy of measuring instruments and their consistency. In this study, the validity test uses the Product Moment correlation

technique from Karl Pearson. The reliability testing in this study uses the Split Half Method based on Spearman Brown. The data analysis technique used in this study is by validating the instrument through normality tests and homogeneity tests. In this study, the normality test uses a formula based on Kolmogorov Smirnov. The homogeneity testing in this study uses the Harley formula. The data analysis technique used in this research uses the normality test, homogeneity test, and hypothesis testing with decision making criteria from the t-test so that the null hypothesis (H_0) is accepted or rejected.

3 Research Result and Discussion

3.1 Research Result

This experimental research used to find the effect of Mastery Learning model on the mathematics learning outcomes of class III students at SD Negeri Gondangdia 01 Pagi. This research was conducted in two meetings with participants pretest before learning and posttest after learning in mathematics subject theme 7 material on the perimeter and area of a flat shape. This research begins with the process of validating the question test instrument so that each question item is valid.

Table 2. Multiple Choice Question Validity Test Results

No. Question	r_{count}	r_{table}	Information
1.	0,352	0,361	Invalid
2.	-0,145	0,361	Invalid
3.	0,363	0,361	Valid
4.	0,565	0,361	Valid
5.	0,181	0,361	Invalid
6.	0,387	0,361	Valid
7.	0,234	0,361	Invalid
8.	0,470	0,361	Valid
9.	0,587	0,361	Valid
10.	0,339	0,361	Invalid
11.	0,427	0,361	Valid
12.	0,401	0,361	Valid

13.	0,133	0,361	Invalid
14.	0,665	0,361	Valid
15.	0,239	0,361	Invalid
16.	0,322	0,361	Invalid
17.	0,194	0,361	Invalid
18.	0,535	0,361	Valid
19.	0,306	0,361	Invalid
20.	0,634	0,361	Valid

Based on the validity test table for multiple choice questions using the SPSS version 29 program, out of a total of 20 multiple choice questions, 10 questions were declared valid because of their value. $r_{\text{count}} > \text{of value } r_{\text{table}}$ by using the distribution $\alpha = 0.05$ with degrees of freedom ($df = N-2 = 30-2 = 28$) to obtain $r_{\text{table}} = 0.361$. Of the 10 valid questions, reliability tests were carried out using techniques Split Half in the SPSS program.

Table 3. Reliability Test Results

Spearman-Brown Coefficient	Equal Length	0,780
	Unequal Length	0,780
Guttman Split-Half Coefficient		0,779

An instrument is said to be reliable if the Spearman-Brown reliability coefficient value is more than 0.70. Based on the calculation results using SPSS 29 in the table above, it is known that the value $r_{11} = 0.779 > \text{value } r_i = 0.70$ indicates that the instrument questions are reliable.

Table 4. Pretest and Posttest Result

		N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest	Exper-	30	70	20	90	68,67	14,559

iment						
Pretest Control	30	60	30	90	66,33	11,842
Experiment Posttest	30	40	60	100	86,67	14,499
Posttest Control	30	40	60	100	77,00	10,222
Valid N (listwise)	30					

Descriptive statistical results can be useful for presenting an overview of pretest and posttest experimental class and control class obtained from students' test answers. Based on the results table pretest and posttest it is obtained that the average value (mean) in an experimental class that uses the Mastery Learning model there was a greater increase from 68.67 to 86.67 compared to the control class using the Cooperative Learning model NHT type only increased from 66.33 to 77.00.

Table 5. Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Say.	Statistic	df	Say.
Pretest Experiment	0,134	30	0,180	0,948	30	0,148
Pretest Control	0,200	30	0,004	0,937	30	0,074
Experimental Posttest	0,084	30	0,200	0,973	30	0,629
Posttest Control	0,101	30	0,200	0,976	30	0,717

Based on the results of calculations using the Shapiro-Wilk test in the table above, it is known that the value is significant pretest in the experimental class 0.148 and the control class 0.074 > significance level 0.05 so the data is normally distributed. The same is shown in the significance of values posttest in the experimental class 0.629

and the control class $0.717 > \text{significance level } 0.05$ so that the data is also normally distributed.

Table 6. Homogeneity Test Results

		Levene tistic	Sta-	df1	df2	Say.
Pretest	Based on Mean	0,824		1	58	0,368
	Based on Median	0,695		1	58	0,408
	Based on Median and with adjusted df	0,695		1	56,588	0,408
	Based on trimmed mean	1,274		1	58	0,264
Posttest	Based on Mean	1,740		1	58	0,192
	Based on Median	1,613		1	58	0,209
	Based on Median and with adjusted df	1,613		1	57,875	0,209
	Based on trimmed mean	1,609		1	58	0,210

Based on the results of calculations using the Levene test in the table above, it is known that the value is significant pretest in the experimental and control classes, namely $0.368 > 0.05$ significance level so that the data is homogeneous and has the same variance. The same thing is also shown in the significance of values posttest in the experimental and control classes, namely $0.192 > 0.05$ significance level so that the data is also homogeneous and has the same variance.

Table 7. Hypothesis Test Results

Leven's Test for Equality of Variances				t-test for Equality of Means			
				Significance			
F	Say.	t	df	One	Two	Mean	Std. Error

						Sided p	Sided p	Difference	Difference
Nilai Posttest	Equal variances assumed	1,740	0,192	3,385	58	< 0,001	0,001	9,667	2,856
	Equal variances not as- sumed			3,385	56,79	< 0,001	0,001	9,667	2,856

Based on the table above, the results of the hypothesis test show that the Sig. is $0.001 < \text{significant level value } 0.05$. This shows that H_0 rejected and H_1 accepted which means there is an influence on the use of Mastery Learning model on the mathematics learning outcomes of class III students at SD Negeri Gondangdia 01 Pagi.

3.2 Discussion

Based on the research results above, it is known that the Mastery Learning model has a significant influence on mathematics learning outcomes. This is shown in the experimental class experiencing a greater increase in learning outcomes compared to the control class because of the use of the Mastery Learning model, students are given the opportunity to repeat and correct mistakes so that they are able to master the material as a whole before moving on to the next material.

The results of this research are in line that learning using the Mastery Learning model helps students understand basic concepts more deeply, so they are able to master the material better [13]. This model not only improves learning outcomes, but can also increase self-confidence and critical thinking skills. Significant influence in implementing the Mastery Learning model on student learning outcomes that teachers can also build an active and enjoyable learning atmosphere through implementing this model which will have an impact on improving student learning outcomes [14].

To be able to influence mathematics learning outcomes, Mastery Learning model can be implemented through several important steps. First the teacher must set clear and specific learning objectives to ensure that students understand the competencies that must be achieved. Second, teachers can provide material by collaborating with other methods such as demonstrations, using audio-visual media, and creating practice questions that have stages of difficulty. And third, which is included in the core activities of the Mastery Learning model, namely conducting periodic evaluations after learning to identify the extent to which students have mastered the material. For students who have not achieved good results, remedial needs to be given in the form of re-teaching or additional activities tailored to individual needs. These stages must be carried out repeatedly until all students reach the expected level of mastery [15].

But there are weaknesses in the Mastery Learning model that apply the Mastery Learning model takes quite a long time because students who are active in learning have to wait for students who are passive to master the material [16]. Another weakness that teachers must experience is the Mastery Learning model. This requires teachers to master the material more broadly, completely and thoroughly, remembering that this model refers to complete mastery of the material [17].

The solution is the length of time required to implement the Mastery Learning model, namely by conducting peer tutoring to guide students who experience learning difficulties [18]. Because when delivered by peer tutors, students understand the lesson material more easily and quickly compared to the teacher's explanation. Creating a flexible schedule outside of school learning hours can also help students master each material. Teachers can also carry out intensive training to have a deeper and broader understanding of the material to be taught. Utilization of technology such as accessing interactive modules can help speed up the learning process and reduce the burden on teachers [19].

4 Conclusion

Based on the results and discussion, it can be concluded that the Mastery Learning model has a significant influence on the mathematics learning outcomes of class III students at SD Negeri Gondangdia 01 Pagi. Through this learning model, students are emphasized on mastering the material before moving on to the next material to help students understand the concept of the material as a whole. The use of this model has proven effective in increasing students' understanding of mathematical concepts, as shown by the increase in the average student mathematics learning outcomes after implementing the Mastery Learning model through repeated stages. However, it takes quite a long time to implement this learning model. Therefore, it is necessary to provide peer tutoring so that students understand the lesson material more easily and quickly.

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