

The effect of learning models *Realistic Mathematics Education*(RME) on mathematics learning outcomes of 4th grade elementary school

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Submitted/Received 29 March 2022; First Revised 6 April 2022; Accepted 1 December 2022
First Available Online 1 December 2022; Publication Date 1 December 2022

Abstract

This study aims to determine the approach of Realistic Mathematics Education (RME) to the mathematics learning outcomes of fourth grade students at SD Negeri Ujung Tanah II Makassar City. This research is a quantitative research using quasi-experimental method. The design used in this study is a quasi nonequivalent control group design. This design was conducted to determine whether there was a difference between the experimental class and the control class by giving a pretest before being given treatment and a posttest after being given treatment. The population in this study were all fourth grade elementary school students from six public elementary schools located in cluster II, Ujung Tanah District, Makassar City, the samples taken were students in grades IV A and IV B at SD Negeri Ujung Tanah II Makassar City. Data collection techniques using questionnaires, tests and documentation. The data analysis technique used was the independent sample t-test. The results of this study indicate the effect of mathematics learning outcomes given in the form of applying the Realistic Mathematics Education (RME) approach compared to students who are not given treatment. The application of Realistic Mathematics Education (RME) is stated to be influential because it increases the potential of students which are used to develop their own knowledge, through exploration of various problems, both problems of daily life and mathematical problems. Based on the independent sample t-test on the hypothesis, the sig value was obtained. $0.001 < 0.05$ then H_0 is rejected and H_1 is accepted,

Keywords: *Realistic Mathematics Education (RME) Approach, Learning Outcomes*

PRELIMINARY

Education is a basic need because education plays an important role in preparing human resources for life in the future because with education a person can prosper his life so that he can compete on an equal basis with other individuals.

The word of Allah in the Qur'an, Allah explains that people who are educated and have knowledge are different from people who do not have knowledge, Allah also explains that people who know the truth are not the same as people who do not know the truth. As the word of Allah SWT regarding the importance of knowledgeable people in the Qur'an Surah Az-Zumar verse 9 which reads:

Translation: "Are you O polytheists who are more fortunate) or are you one who

worships at night with prostration and standing, while he fears the (punishment) of the Hereafter and hopes for the mercy of his Lord? Say: "Are those who know the same as those who don't know?" Verily, it is people who are wise who can receive lessons)."

It can be said that mastery of mathematics is the foundation for mastering science and technology. Mathematics lessons function to train accuracy, precision and accuracy of work. Learning mathematics in the 2013 curriculum that is being implemented in learning in schools must pay attention to the Core Competencies which are designed in four interrelated groups, namely with regard to religious attitudes (Core Competency 1), social attitudes (Core Competency 2),

knowledge (Core Competency 3), and application of knowledge (Core Competency 4).

Based on initial observations in class IV SD Negeri Ujung Tanah II Makassar on January 4 2021 the researcher asked permission from Mr. Iskandar as the principal of SDN Ujung Tanah II Makassar, preliminary observations were made to get an overview of the research location, research subjects and get a glimpse of the process of learning mathematics. Student learning outcomes are unsatisfactory because in learning activities there are many obstacles such as lack of concern for students during assignments, there are still students who copy friends' assignments, often do not do homework, and often borrow friends' stationery. Another obstacle is that the teacher still uses a monotonous learning model and teaching method, the teacher also does not use an interesting learning model so that the material from the teacher is not conveyed properly.

Based on these observations, the researcher wanted to know the effect of the Realistic Mathematical Education (RME) approach when compared to the conventional model. Realistic Mathematical Education (RME) approach is one solution that will be used by researchers to determine the results of learning mathematics.

Based on this description, the authors are interested in conducting research with the title "The Influence of Realistic Mathematics Education (RME) Approach on Mathematics Learning Outcomes of Grade IV Students at SDN Ujung Tanah II Makassar City".

RESEARCH METHODS

This type of research uses quantitative research. This research uses experimental research to find out the effect of certain treatments on others under controlled conditions. The experimental research used was a quasi-experimental non-equivalent control group design. This study involved two classes, one experimental class and one control class. The experimental class was given treatment in the form of a Realistic

Mathematics Education (RME) approach and the control class was given teaching using conventional learning. The research design is described as follows:

Table 1
Research Design Nonequivalent Control Group Design

Class	Pretest	treatment	Posttest
Experiment	O ₁	X	O ₂
Control	O ₃	-	O ₄

(Source: Sugiyono, 2008)

O₁O₃= Pretest mathematics learning outcomes
O₂O₄= Posttest mathematics learning outcomes

X = Treatment with the RME approach

The population in this study is all fourth grade elementary school students in Cluster II Ujung Tanah sub-district. The following table shows the population of class IV SD Sekugus II, Ujung Tanah District academic year 2020/2021.

Table 2
Research Population

No	School name	Class IV		Total student s
		A	B	
1	SDN Tabarrangan V	30	28	58
2	SDN Ujung Tanah I	30	31	61
3	Ujung Tanah II Elementary School	30	30	60
4	Barrang Caddy Elementary School	28	29	57
5	SDN Barrang Caddi II	30	32	62
6	Langkawi Elementary School	31	32	63
Total				361

The sample technique used is cluster random sampling. *Random sampling cluster* is a way of taking random samples from existing samples as a population. The method of taking random school samples in this study was by means of a simple lottery. The sample used in this study was SD Negeri Ujung Tanah II which was taken at random from the cluster II Ujung Tanah District.

RESULTS AND DISCUSSION

This research was conducted at SD Negeri Ujung Tanah II Makassar City for students in class IV.A and class IV.B, consisting of an experimental class and a control class. The experimental class is the class that is given treatment during learning using the Realistic Mathematics Education (RME) approach, while the control class is the class that is not given treatment. The type of research data is quantitative which is obtained from fourth grade students. The research data includes data, namely the mathematics learning achievement test.

1. Descriptive Analysis Results

Table 3
Recapitulation of Assessment of
Mathematics Learning Outcomes of Class
IV SD Negeri Ujung Tanah II Makassar
City Pretest and Posttest

Descriptive statistics	Pretest Value	Posttest Value
Means	69.03	76.4
Median	69	75.5
mode	72	83
Minimum	59	68
Maximum	75	85
Standard Deviation	3.91	4.72

Source: Data processing with SPSS version 23 (2022)

Table 4
Percentage of Mathematics Learning
Outcomes of Class IV SD Negeri Ujung
Tanah II Makassar City Before Treatment
(Pretest)

Score	Score	Category	F	%
<70	D	Need Guidance	17	56,67
71-80	C	Enough	13	43,33
81-90	B	Well	0	0
91-100	A	Very good	0	0
Amount			30	100

Based on Table 4, it shows that the percentage of learning outcomes of Class IV Students of SD Negeri Ujung Tanah II Makassar City before treatment, there were 17 students (56.67%) in the category who needed guidance, there were 13 students (43.33%) in the sufficient category. This shows that the results of learning mathematics in Class IV SD Negeri Ujung Tanah II Makassar City are still relatively low or need guidance.

Table 5
Percentage of Mathematics Learning
Outcomes for Grade IV SD Negeri Ujung
Tanah II Makassar City After Treatment
(Posttest)

Score	Score	Category	F	%
<70	D	Need Guidance	4	13,33
71-80	C	Enough	20	66.67
81-90	B	Well	7	23.34
91-100	A	Very good	0	0
Amount			30	100

Based on Table 5 shows that the percentage of mathematics learning outcomes for Class IV students at SD Negeri Ujung Tanah II Makassar City after treatment, there are 4 students (13.33%) in the category need guidance, there are 20 students (66.67%) in the sufficient category. , there are 7 students (23.34%) in the good category. This shows that the mathematics learning outcomes of

Grade IV students at SD Negeri Ujung Tanah II Makassar City increased after being given treatment.

2. Inferential Statistics

a) Normality test

Table 6
Normality Test Results

Variable	Class	SAPHIRO WILK			Conclusion
		Statistics	df	Sig.	
Mathematics Learning Outcomes	Experiment	0.953	30	0.208	Normal Distributed
	Control	0.970	30	0.552	Normal Distributed

Source: Data processing with SPSS version 23 (2022)

Based on the normality test table above, the experimental class and the control class have a significance value of more than 0.05 so that the data can be said to be normally distributed.

b) Homogeneity Test

Table 7
Homogeneity Test Results
Test of Homogeneity of Variances

	Levene Statistics	df1	df2	Sig.
Learning outcomes	2,129	1	58	0.150

Source: Data processing with SPSS version 23 (2022)

Based on the homogeneity test table above, learning outcomes have a significance value of more than 0.05 so that it can be said that the research data is homogeneous.

c) Hypothesis Test

Table 8
Independent Sample T-Test Test Results
Mathematics Learning Outcome Data
Independent Samples Test

Multivariate Testa					
Effect		Value	F	Hypothesis is df	Sig.
Intercept	Pillai's Trace	0.904	269.662b	2,000	57,000
	Wilks' Lambda	0.096	269.662b	2,000	57,000
	Hotelling's Trace	9.462	269.662b	2,000	57,000
	Roy's Largest Root	9.462	269.662b	2,000	57,000
Class	Pillai's Trace	0.455	23,761b	2,000	57,000
	Wilks' Lambda	0.545	23,761b	2,000	57,000
	Hotelling's Trace	0.834	23,761b	2,000	57,000
	Roy's Largest Root	0.834	23,761b	2,000	57,000

a. Design: Intercept + Class

b. Exact statistics

CONCLUSION

Based on the research results obtained in data analysis and discussion, the conclusion in this study is that the significance value of $p(\text{sig}(2\text{-tailed}))$ is 0.013 because $p < 0.05$ then H_0 is rejected and H_1 is accepted. It can also be seen that $t_{\text{count}} > t_{\text{table}}$ is $2.551 > 2.00172$ so that it is said that there is an influence of the Realistic Mathematics Education (RME) approach on the mathematics learning outcomes of Class IV SD Negeri Ujung Tanah II Makassar City.

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