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The Effectiveness of Realistic Mathematics Education (RME) Approach toward Students' Mathematics Learning Achievement of Junior High School Students

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A B S T RAK

Penelitian ini bertujuan untuk mengetahui keefektifan Pembelajaran Model Realistic Mathematics Education (RME) terhadap prestasi belajar matematika siswa kelas VII SMP ba'it Al-Quran Kayuagung tahun pelajaran 2019/2020. Penelitian ini dilakukan di SMP Al-Quran Ba'it tahun ajaran 2019/2020. Jenis penelitian ini adalah penelitian percobaan semu (quasi experiment). Teknik pengambilan sampel dalam penelitian ini menggunakan teknik simple random sampling, sampel penelitian adalah kelas VII Kairo sebagai kelas eksperimen dan kelas VII Mekkah sebagai kelas kontrol. Instrumen tes menggunakan jenis tes uraian. Teknik analisis data dengan uji prasyarat dan uji hipotesis. Uji prasyarat berupa uji normalitas dan uji homogenisasi sedangkan uji hipotesis dengan menggunakan analisis statistik parametrik adalah Independent Sample T Test pada ekuivalen α-significance = 0,05. Hasil penelitian menunjukkan bahwa terdapat perbedaan hasil belajar antara siswa yang menggunakan pendekatan Matematika Realistik. Hal ini pada saat dilakukan analisis uji Independent Samples T Test Nilai post-test diperoleh signifikansi 0,000 < 0,05, maka H_0 ditolak. Artinya pendekatan Realistic Mathematics Education (RME) efektif untuk meningkatkan prestasi belajar matematika siswa di SMP Ba'it Al-Quran Kayuagung.

A R T I C L E I N F O

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A B S T R A C T

The research aims to determine the effectiveness of Realistic Mathematics Education (RME) Model Learning of mathematics learning achievement in grade VII in SMP ba'it Al-Quran Kayuagung school year 2019/2020. This study was conducted at the Al-Quran Ba'it Junior High school year 2019/2020. This type of research is the research of pseudo experiments (quasi experiment). The sampling techniques in this study used simple random sampling techniques, the research sample was Cairo's class VII as an experimental class and the VII class of Mecca as the control class. Test instruments using this type of essay test. Data analysis techniques with prerequisite test and hypothesis testing. Test prerequisite in the form of normality and homogenization test while the hypothesis test using

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parametric statistical analysis is Independent Sample T Test at the equivalent of α-significance = 0.05. The results showed that there were different learning outcomes among students who used the Realistic Mathematics approach. This is in the event of test analysis of Independent Samples T Test The value of the post test obtained significance 0.000 < 0.05, then H_0 rejected. This means that the Realistic Mathematics Education (RME) approach is effective to improve the students' mathematics learning achievement at SMP Ba'it Al-Quran Kayuagung

1. INTRODUCTION

The mathematical learning is taught from elementary school level to higher education level and is used in daily life (Heni, 2019; Akbar, 2018; Bernard, 2019; Sugandi, 2019). In the process of junior high school mathematics, students learn about the discussion of the set material which is new material for junior high school students VII. The set is a set of objects that have certain conditions and are clear (Murniasih, 2016). Certain conditions and clearly in determining the members of a set are very important because in order to distinguish which members of the set and which are not members of the set so that the set materials are important material to learn and understand well.

But in reality, student learning results are still categorized as low or under the value of Minimal submission criteria (KKM). So it can be said that the process of learning teaching in mathematical subjects is not or less effective.

One indicator of effectiveness in mathematics learning is achievement or learning outcomes, if the student learning results in high results indicate that the mathematical learning process is effective, the opposite of mathematical learning results tend to be low is an indication that there is an ineffectiveness in the process of learning mathematics. Many factors affect students mathematical learning outcomes. The results of students low mathematics learning are caused by many things, such as solid curriculum, less effective learning media, strategies and learning methods chosen by less precise teachers, poor evaluation systems, teachers ability to inspire students learning motivation, or also because of learning approaches that are still conventional so that students are not much in the learning process.

Based on a variety of factors causing low mathematics learning results, it can be assumed that one of the factors that led to the low quality of mathematics learning in leave by

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Kekurangtepatan teachers in choosing a learning approach in delivering learning materials. The learning approach factor is one of the main factors that greatly affects learning outcomes, especially for math learning at the Junior high school level. This is because the objects learned in mathematics are still abstract, while the thought power of junior high school students is still concrete. At the age of middle school students basically not optimal ability of abstraction.

One of the ways that can be used to improve student learning outcomes is that teachers should be able to provide concrete learning by adapting the student's daily situation. A learning approach that can be used in order to improve the activity and student learning outcomes of the RME approach. Agus (2017:78) The RME approach is a new strategy that invites students to be more active and creative in thinking, this strategy uses problem solving based on the reality and environment utilization that students understand to facilitate the learning process. The Realistic Mathematics Education (RME) Learning approach is a mathematical learning approach that uses a "real-world" context that allows students to connect learning materials with their experiences. Freudenthal (in Ozdemir, 2017:407) The focus point of Realistic Mathematics Education (RME) is the idea that Mathematics result from human activities and the process of mathematical objects are abstract, such as ideas, ideas, concepts, symbols, and systems of interconnectedness between elements in a community (set). Therefore, the teaching needs to be delivered with the right approach so that the learning objectives can be achieved. Moreover, to study at SMP level, it is psychologically the level of mental development of students in junior high school in general is still a concrete stage of understanding, has not been able to think abstract. Therefore, it is necessary to find a mathematical learning approach that corresponds to the student's mental development.

The above exposure should be done research related to the efforts to improve the learning results of mathematics, especially in junior high school. The problems that will be researched are formulated in relation to the learning approach of mathematics to the students ' learning outcomes, the differences in mathematical learning outcomes given through RME with those given conventionally.

2. RESEARCH METHODS

This research is a type of ecperimental quasi research (pseudo experimentation). Experimental research design used is a Nonequivalent control group design. The effect of treatment on students ' mathematical problem-solving skills (OE2 – OE1) – (OK2 – OK1), can be seen from Table 1 below.

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Table 1 Design Experiments Research

Class	Pretest	Treatment	Postest
Eksperimen	O_{E1}	X	O_{E2}
Kontrol	O_{K1}	-	O_{K2}

Description :

O_{E1} : pretest class experiment

O_{K1} : prestest control class

X : Treatment of experimental class with RME approach

O_{E2} : postest experimental class

O_{K2} : postest control class

3. RESULT AND DISCUSSION

After the data processing results of the experiment class pretests and control class, obtained descriptive statistics consisting of maximum value, minimum, average, standard deviation and variance. Next in present descriptive data statistics result pretests and Postest experimental class and control class using SPSS 22 for Windows Software, can be seen from Table 2 below.

Table 2 Pretest and Postest Description

Score	Experimental		Control	
	Pretest	Posttest	Pretest	Posttest
Total students (n)	22	22	22	22
Highest	77	92	81	89
Lowest	54	80	55	67
Average	67,64	85,55	66,64	77,55
varian	43,96	12,83	49,47	28,83
Standard deviation	6,630	3,582	7,034	5,369

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According to Table 2 it appears that there was an increase in reasoning ability in the class of experiments and control classes after treatment. It is also apparent that the average Postest value for the experiment class is higher than the control class. Before conducting the hypothesis test, first test normality, homogenity test and initial proficiency test, can be seen from Table 3 below.

Table 3. Normality Test

	Class	**Kolmogorov-smirnov**		
		Statistic	Df	Sig.
Student Learning Results	Pree test Eksperimen (RME)	.144	22	.200
	Post test Eksperimen (RME)	.121	22	.200
	Pree test Kontrol	.112	22	.200
	Post test Kontrol	.166	22	.118

According to Table 3 it is obtained that the significance value of the pretests and postest classes of experimentation and control class is more than $\alpha = 0.05$ so it can be concluded that the class data of the experiment and control class are derived from the subject of normal distribution, can be seen from Table 4 below.

Table 4. Homogeneity test

Test of Homogeneity of Variance

		Levene Statistic	**df1**	**df2**	**Sig.**
Student Learning Outcomes	Based on Mean	1.038	1	42	.314
	Based on Median	1.037	1	42	.314
	Based on Median and with adjusted df	1.037	1	32.319	.316
	Based on trimmed mean	1.037	1	42	.314

According to Table 4 it is obtained that the pretests and postest values of the experiment class and the control class produce a significance value of more than $\alpha = 0.05$ so that it can be concluded that the data obtained from the Exsaperimentary class and the control class have the same variances (homogeneous), can be seen from Table 5 below.

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Table 5. Preliminary Ability Test

Average

Data	Significance	Decision	Conclusion
Pretest	0,63	H_0 acceptable	There is a similarity of average initial ability

According to Table 5 it is derived that the significance of the pretests value is more than α = 0.05 so that it can be concluded that there is no difference in initial capability between experimental classes and control classes or in other words experimental classes and control classes have the same initial capabilities., can be seen from Table 6 below.

Table 6. Postest test Result-T sample class experiments and Postest control classes

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 Siswa	Equal variances assumed	1.038	.314	5.813	42	.000	8.000	1.376	5.223	10.777
	Equal variances not assumed			5.813	36.602	.000	8.000	1.376	5.211	10.789

In Table 6 above it can be seen that the final test or postest value obtained the significance of Sig. (2-tailed) with the T test of 0.00. Because the value of probability is smaller than 0.05 then the H0 is rejected IE there is a significant pedaan of learning results Mathematics students Junior High school class VII of Bait Al-Quran Kayuagung after obtaining Realistic Mathematics Education (RME) learning model.

Based on the analysis above, there can be a significant difference in the implementation of the RME learning approach to student learning outcomes, this research is relevant to what Zulkardi (2009), Widyastuti, et al (2014), and Muncarno, dkk (2018), were reviewed from the

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learning model, research design, and hypothesized test results stating that there is a significant difference in the implementation of the RME approach to students ' mathematical learning outcomes. Based on the analysis above, it is known that the RME approach is more effective in improving the learning outcomes of class VII students on mathematical subjects.

4. KESIMPULAN

Conclusions and suggestions of research hypotheses, data analysis has been carried out, it can be concluded that students ' mathematical learning outcomes taught with a higher RME approach than those taught with conventional approaches and in this case can be noted that the learning approach of Realistic Mathematics Education (RME) is more effective than conventional learning approaches in junior high school mathematics. From the conclusion gained advice to mathematics teachers should learn and further deepen the concepts and theories of RME learning approach so as to optimize learning outcomes for various learning *materials.*

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