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Approach RME and Ability Understanding Mathematical Student SMPS Muhammadiyah 41 Stem Toru

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Abstract
This study aims to determine the effect of the Realistic Mathematics Education approach to the Mathematical Understanding ability of students at SMPS Muhammadiyah 41 Batang Toru. This research uses a quantitative research type with a quasi-experimental method. The population of this study consisted of all eighth grade students of SMP S Muhammadiyah 41 Batang Toru with a total of 100 students, and two classes of 64 students were taken using a random sampling technique. Data collection techniques with written tests in the form of essay questions. Based on the results of the study, the results of t test analysis using SPSS 22 obtained the results that the tcount > ttable (9.321 > 1.998). This shows that students' mathematical understanding ability is better if the strategy used is the Realistic Mathematics Education approach compared with conventional learning methods. Therefore, the approach of Realistic Mathematics Education can be used US a learning strategy in implementing mathematics learning.

Keywords: Realistic Mathematics Education, Mathematical Understanding Abilities

Introduction

Law No. 20 Year 2003 about the National Education System mention, that national education functions to develop abilities and shape character and dignified national civilization in order to enlighten the life of the nation. Education aims to develop the potential of students to become people who believe and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. (Trianto, 2018) said that education that is able to support future development is education that is able to develop potential participant educate And touch potential conscience and also potential competency . participants educate so that Which concerned capable face And solve problem the life he faces. The concept of education feels increasingly important when someone must enter life in society and in the world of work, because the person concerned must able to apply what is learned in school to deal with problems faced in life daily moment this and Which will come.

Schoenfeld (in Hendriana & Soemarmo, 2016:6) explains that Mathematics is a living and growing discipline where truth is achieved individually and through

mathematical society. Mathematics is also a basic science that underlies the development of other sciences. In addition, the role of mathematics is also an activity that applies and useful in everyday life. The characteristics of mathematics direct the vision of mathematics in two directions of development, namely to meet current needs and future needs Which will come. He Also continue that Vision First direct learning mathematics for understanding mathematical concepts and ideas which is then required to solve problems in mathematics and other sciences. The second vision in the sense that more wide And leading to time front, mathematics give opportunity development logical, systematic, critical and careful reasoning ability, creative, fostering a sense of self-confidence self and a sense of beauty towards the regularity of mathematical properties, as well as developing the properties of objects And open Which required in face the future that always changed (Nifrani et al., 2024)

Based on vision Which has exposed on, learn mathematics become reason important For reach vision the. Mathematics is means Which appropriate For develop students' mathematical abilities. The abilities mathematics Which meant like ability understanding mathematical, breakdown problem mathematical, connection, communication, reasoning, think critical, And think creative. Wrong One The mathematical abilities of students that need to be developed are mathematical understanding abilities. students. (Lestari et al., 2015) provides an explanation that mathematical understanding ability is ability absorb And understand ideas mathematics. Ability understanding student mathematics needs to be developed so that student can more easy in understand material without having to memorize the formula. Indicators of mathematical understanding ability according to (Lestari et et al., 2015, p. 81) that is: (1) Identifying And make example And No example **;** (2) Translating and interpreting meaning symbols, tables, diagrams, picture, graphs and sentences mathematical **;** (3) Understand And apply idea mathematical; (4) Make a extrapolation (estimation).

(Sustainable et et al., 2015) explain that Understanding mathematical is ability absorb And understand ideas mathematics. Ability base For think And solve mathematical problems and real life problems. recognize and apply mathematical concepts, procedures, principles and ideas correctly to simple cases. But in reality, mathematical understanding has a high level of cognitive demands. different. The definition of understanding was also put forward by Hamalik (in Hendriana & Sumarmo, 2017, p. 5) namely the ability to see the relationship between various factors or elements in a situation. which is problematic. So, the conclusion is that understanding is a process or way of interpreting a situation. and the facts he knows based on the level of ability he has. According to Abidin (in Hendriana & Mr. Sumarmo, 2017, p. 7) that understanding is ability to explain And interpret something.

Understanding mathematical is Wrong One objective important in learning,

provide an understanding that the materials taught to students are not just as memorization, However more from That with understanding student can more understand material That itself (Pasaribu, 2017). Understanding is a translation of the term understanding which can be interpreted as the absorption of the meaning of the material being studied. Students can be said to understand if The student is able to absorb the material he is studying. Students must have the ability understanding included in one aspect cognitive domain in Bloom's Taxonomy. There are three aspects of understanding, namely the ability to recognize, the ability to explain, and to draw conclusionsconclusion(Marbau et al., 2019)

Based on a number of opinion on, so in take conclusion that Ability Mathematical understanding is the ability to absorb and understand mathematical ideas. comprehensive and functional, remembering mathematical formulas and concepts and applying them insimple cases or in similar cases. Also called the ability to remember and apply mathematical symbols, notations, and formulas, as well as the ability to memorize and estimate things without doubt (Nifrani et al., 2024) .

Speak about mathematics at school, fact in the field in learning mathematics learning objectives and vision of mathematics and understanding ability students' mathematical abilities have not been achieved optimally in each educational unit. The teachers realizing that mathematics is not an easy subject for most students (Nifrani et al., 2024) . Information which the researcher got from one of the mathematics teachers at Muhammadiyah Middle School 41 Batang Toru that students think that mathematics is difficult subjects in understand, scary and boring. He also said that there are still many students who not yet able to do the math problems given, especially if the problems are not same as the example given. That means there are still many students who are unable to masterlesson mathematics and ability mathematical understanding student also still low.

Apart from the above, what generally happens in the field is that learning in Schools are still running conventionally. Students only listen and take notes. material delivered by the teacher, and as a result the students' mathematics scores are lower compared to other subjects (Suningsih et al., 2023) . Low learning achievement of students in mathematics No solely Because the material Which difficult, but Also due to Because process learning Which not enough interesting (Musthofa et al., 2023) . Often activity participant educate tend passive And impact on the achievement of less than satisfactory learning outcomes. To increase learning activities Study And ability understanding mathematical student, need attempted approach/model learning that leads to the process of students discovering various facts themselves, finding values new in his life, apply mathematics in life real. If students learn mathematics separately from their everyday experiences, then students will fast forget and No can apply mathematics.

This is in accordance with the constructivist learning theory, that knowledge will be meaningful. when knowledge That searching for And found Alone by

students. Therefore, teachers need pay attention to the selection of learning strategies that are fun and make students active. Learning strategies that teachers can apply to make students active, and learning The fun thing is to apply the Mathematics Education approach Realistic (PMR).

(Sustainable et et al., 2015 : 40) give explanation that Approach Education Mathematics Realistic (PMR) is mathematics school Which implemented with placing the reality and experiences of students as the starting point for learning. Problems realistic used as source emergence concepts mathematics or knowledge formal mathematics that can encourage problem solving activities, finding problems, and Organizing the main issues of PMR refers to Freudenthal's opinion which states that mathematics must be linked to reality and mathematics is a human activity. Mathematics as activity man It means man must given chance For rediscover mathematical ideas and concepts. According to Treffers (in Shoimin, 2014: 147) There is two type mathematization, that is mathematization horizontal And vertical.In mathematics horizontally students use mathematics to organize and solve problems on situation Which real. Temporary mathematization vertical related with process reorganization of acquired knowledge into more complex mathematical symbols abstract. In PMR both horizontal and vertical mathematization are used in the learning process. teach. Learning mathematics realistic on basically is utilization reality And environment that is understood by students to facilitate the process of learning mathematics, so that reach objective learning mathematics Which better from Which Then (Evi, 2011) .

Approach PMR very appropriate applied in learning mathematics. Approach This PMR encourages students to relate their mathematical activities to real life. real. By linking students' mathematical activities to real life, students will get experience new And find Alone answers from problem Which related with activity mathematics. Approach PMR This designed so that student capable understand contextual problems, solve problems, compare and discuss answer, as well as draw a conclusion. Thus, the application of the PMR approach in Mathematics learning is expected to improve mathematical understanding skills students. Mathematics is not a finished product that is ready to use, but rather a form of activities in constructing mathematical concepts. Freundenthal (in Siti Maslihah, 2012: 111) do not place school mathematics as a closed system but rather as a activity Which called mathematization.

Studying various situations that can illustrate various problems is a valuable learning experience for participants educate, started with connect mathematics with real situations, providing opportunities to develop models. mathematics and understand more things at a higher level (Muhtadi & Sukirwan., 2017). Meanwhile, according to Streefland (in Aris Shoimin, 2004:148) the main principle in learning teach Which based on on teaching realistic is:

Construction and Concretizing

In this principle it is said that learning mathematics is a construction activity. Characteristics This construction in learning, namely students discover the procedures for themselves use experience And concrete objects.

Levels and Models

Learning a mathematical concept or skill is a long-term and ongoing process. moving at varying levels of abstraction. To be able to accept the increase in this level from context arithmetic informal until arithmetic formal in learning used model so that can bridging between concrete and abstract.

Reflection and special Assignment

Study mathematics And increase level special from process Study improved through reflection. Evaluation to somebody No only based on on results just, but Also understand how a person's thinking process. It is necessary to consider how to provide evaluation to answer student Which varies.

Social context and interaction

Study No only is activity individual, but something Which happen in public And direct relate with context sociocultural.Then from That in in Study, student must given chance exchange ideas, argue, and and so on.

Structuring and interwining.

Learning mathematics does not only consist of absorbing a body of knowledge and elements. elements of skills that are not related, but are a structured whole. Concept new and mental objects must fit into a larger or smaller knowledge base. so that in learning attempted so that There is relatedness between the One And Which other.

Opinion other according to Soedjadi (in Thank you, 2016 : 111) put forward that Realistic Mathematics Education is basically the use of reality and the environment that has been understood by students to facilitate the process of learning mathematics, with the hope that objective learning mathematics can achieved more Good from on time Which Then. Based on From the descriptions of several experts above, we can take the conclusion that basically the principle or The underlying idea of Realistic Mathematics Education (RME) is a situation where students are given opportunity to rediscover mathematical ideas. Based on realistic situations, students encouraged to construct their own realistic problems, because the problems constructed by Students will attract other students to solve it. The process involved in thinking and this problem solving can improve their results in the problem.That means students requested For look for own solution on the issue that found based on

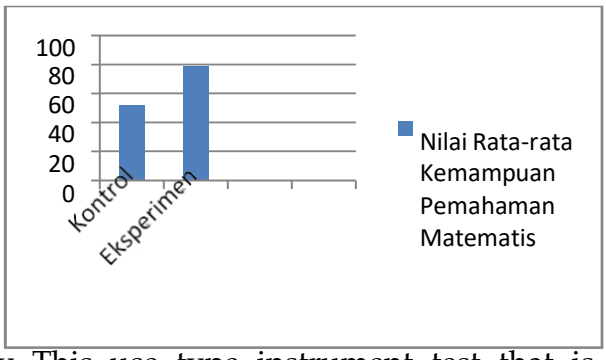
situation realistic.

Leave from thinking on, studies Which focus on influence a approach learning towards students' mathematical understanding abilities to improve learning outcomes mathematics It is important to do this. This encourages researchers to conduct research For see influence approach Education Mathematics Realistic to ability Mathematical understanding student JUNIOR HIGH SCHOOL Private Muhammadiyah 41 BatangToru.

Results and Discussions

This type of research uses study quantitative with quasi-experimental methods. This research was conducted at Muhammadiyah 41 Batang Toru Middle School, located at Melati Street, Wek II Village, Batang Toru District, South Tapanuli Regency, South Tapanuli Province North Sumatra. This research was conducted in the even semester of the 2019/2020 academic year. The The population in this study were class VIII students of Muhammadiyah 41 Batang Toru Middle School and sampling using the Simple Random Sampling technique (random sample). Based on technique taking sample, Which will chosen become sample that is 2 class chosen in a way random, then randomized again so that get class which will be taught with method conventional (control) and classes that will be taught using the PMR approach (experiment). As for The sample chosen was class VIII-B which consisted of 32 students as the experimental class And class VIII-C Which consists of 32 students as a class control.

Grafik 1. Rata-rata Pemahaman Matematis Siswa



Study This use type instrument test that is test ability understanding mathematically. In this study, the test instrument was used to determine the influence of the Approach Realistic Mathematics Education towards students' mathematical understanding abilities at the time experiments were conducted. In the research This, first step which is conducted namely by testing validity And reliability instrument ability understanding mathematical with amount question as much as 4 questions. From analysis results validity test served data

as follows:

Tabel 1. Uji Validitas Instrumen

Correlations

		item_1	item_2	item_3	item_4	skor_total
item_1		1	.038	-.018	-.083	.470**
	Sig. (2-tailed)		.836	.921	.653	.007
	N	32	32	32	32	32
item_2		.038	1	.007	-.198	.403*
	Sig. (2-tailed)	.836		.970	.278	.022
	N	32	32	32	32	32
item_3		-.018	.007	1	.095	.564**
	Sig. (2-tailed)	.921	.970		.603	.001
	N	32	32	32	32	32
item_4		-.083	-.198	.095	1	.479**
	Sig. (2-tailed)	.653	.278	.603		.006
	N	32	32	32	32	32
skor_total		.470*	.403*	.564*	.479*	1
	Sig. (2-tailed)	.007	.022	.001	.006	
	N	32	32	32	32	32

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The validity table shows that in fourth question, $r_{\text{the calculated value}} > r_{\text{table}}$. An instrument it is said valid if mark $t_{\text{count}} > t_{\text{table}}$. On study This $r_{\text{table}} = 0.349$. So all over instrument stated valid.

Tabel 2. Uji Reliabilitas

Cronbach's Alpha	N of Items
.597	5

With use formula alpha, obtained mark $r_{\text{count}} = 0.597$ Whereas mark r_{tsbel} with a significance level of $\alpha = 0.05$ is 0.349 because $r_{\text{the calculated r}} > r_{\text{table,}}$ it can be concluded that the question the stated reliable.

After done test validity test as much as 4 question And all over question stated valid, Then test reliability with use Cronbach's Alpha And mark its reliability of 0.597 and is stated as reliable, then the instrument is suitable for use as measurement.

Testing normality data done For know whether distribution data results research has data distribution that is normally distributed or not. To find the Normality test researcher use application *SPSS 22* as follows :

Tabel 3. Uji Normalitas

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Kelompok	Statistic	Df	Sig.	Statistic	df	Sig.
PMR	.186	32	.006	.948	32	.123
Kontrol	.144	32	.088	.961	32	.299

a. Lilliefors Significance Correction

By using *the Shapiro-Wilk Test* significant value > 0.05, then the data is distributed normal. So based on the analysis mathematical understanding ability in experimental class own significant value . 0.05 (0.123 > 0.05) And control class has significant > 0.05 (0.299 > 0.05), so that data on class experiment And control normally distributed.

Testing data homogeneity done for know whether the sample comes from from population homogeneous or not, It means whether sample the can represent the entire population. The results of the researcher's data homogeneity test calculations using *SPSS* like as follows :

Table 4. Test Homogeneity

Test of Homogeneity of Variance PMR

Levene Statistic	df1	df2	Sig.
1.596	1	62	.211

Based on The results of the homogeneity test using the *Levene's Test method. The Leven's* value is 1.596 with a p value (sig) of 0.211 where 0.211 > 0.05 which means there is a similarity in variance between class experiment And class control after given the treatment that means homogeneous.

The hypothesis in this study was tested using the *Independent Sample T Test.* Test *Independent Sample T Test* is used to determine whether there is a difference in the average sample.

Based on these results, the calculated t value was obtained = 4.388 and the t_{table} = 1.998 at the level significant α = 0.05 and $dk = n_1 + n_2 - 2 = 62$ so it can be seen that $t_{count} > t_{table}$ (4.388 > 1.998) so H_a accepted And H_0 rejected, so that there is influence strategy learning PMR Approach on the mathematical understanding abilities of students at SMP S Muhammadiyah 41 Batang Toru School year 2019/2020.

The first learning process used is by using a learning model. conventional in the control class consisting of 32 students. In this learning, many Students who are less active when asked to ask or answer questions given by the teacher. Some were

sleeping while the learning process was taking place, some were telling stories with the friend next to him, and the class atmosphere was very noisy. This was because the students felt bored just listening to the material from the teacher. Students have difficulty digesting the lesson because students less involved in the ongoing learning process. While at the meeting second, process learning with use Strategy Approach PMR on class an experiment consisting of 32 students, students were divided into several groups and asked to work together or discuss in solving problems given by the teacher and assisted with direction and guidance from the teacher. Finally, many students have dared to ask questions and answer questions and actively participate in learning. On the third and fourth meetings, Researchers experienced obstacles in the learning process, namely the time used during the meeting no maximum Because student must Study at home due to Because pandemic Covid-19. At this meeting, teachers have to meet students from house to house to keep give task And monitor learning student.

In a study conducted in class VIII of Muhammadiyah 41 Batang Toru Middle School in 2014 The 2019/2020 teaching stated that there was an influence of the PMR approach on the ability Students' mathematical understanding of comparative material in class VIII of SMPS Muhammadiyah 41 The trunk of the toru. Average results understanding mathematical student with using the approach PMR in the experimental class was higher compared to the control class which used conventional methods. It can also be seen that the average value of the experimental class is greater above average, namely above 75, while the control class is not. From the description above it is clear that that there is an influence of the PMR approach on students' mathematical understanding abilities on class experiment namely class VIII-B in SMPS Muhammadiyah 41 Bars toru.

Conclusion and suggestions

Based on the results of the analysis carried out in this study, it can be concluded that that there is influence Mathematics Education Approach Realistic to ability understanding mathematical student. In approach PMR This student sued For capable relating mathematics to everyday life based on experience and lessons Which Already studied. Based on discussion And conclusion Which has presented, so writer recommend :For students, to stay enthusiastic in learning even during the Covid-19 pandemic. Keep linking learning materials to everyday life to increase motivation in Study And cause flavor want to discussion with other students. For teachers, with this Realistic Mathematics Education approach, it is hoped that teachers will can make as alternative For increase ability understanding mathematical student in carry out process learning in particular mathematics. For schools, so that existing research results can be used as a reference. to improve and motivate other students to get better grades Good. For student, should in use approach PMR This must Can adapt time so that No There is time Which wasted

vain And must capable monitor students in through the stages Which implemented. For Teacher or researcher furthermore, so that hopefully can monitor student on moment group division and during the learning process, because the atmosphere will be lively when class No capable under control.

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