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Implementation of Realistic Mathematic Education (RME) Model to Improve Learning Outcomes in Polyhedron

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Abstract

This research aims to improve the activity and learning outcomes of eighth grade students of Junior High School. The type of research is Classroom Action Research. The study also used the observation method to determine student activity, questionnaires to determine student responses to the Realistic Mathematics Education (RME) learning model, and tests to determine student learning outcomes improvement. The results of data analysis, it can be concluded that student activity from cycle I to cycle II experienced an increase of 0.23. Where in the first cycle an average of 3.01 was obtained and in the second cycle an average of 3.24 was obtained in the good category. Based on the student response questionnaire, it also increased from cycle I to cycle II by 25%, the percentage of students who answered "Yes". Where in the first cycle a percentage of 60.71% was obtained and in the second cycle a percentage of 85.71% was obtained, which indicated that the student's response was positive. Then based on the test results, it also showed an increase of 20%, where in cycle I obtained a percentage of 60% and in cycle II obtained a percentage of 80%. The improvement in test results in cycle II was said to be classically complete because the percentage obtained was ≥75%. Therefore, it can be concluded that the use of the RME learning model can improve student learning outcomes at Junior High School.

Key words: learning outcomes, polyhedron, realistic mathematics education

INTRODUCTION

Education is a necessary process to achieve balance and perfection in the development of individuals and society. The emphasis of education compared to teaching lies on the formation of awareness and personality of individuals or communities in addition to the transfer of knowledge and expertise. With this kind of process, a nation or state can pass on religious values, culture, thoughts and skills to the next generation, so that they are truly ready to face a better future for the nation and state. The orientation of education in Indonesia still tends to treat students as objects, while teachers always dominate learning, so that learning is still teacher centered. According to Subaidi (2016) in the learning process, in fact the teacher still teaches in the old way, namely teaching with a direct learning model, where the teacher uses lesson time by discussing assignments, then gives new lessons and assigns assignments to students. Learning by focusing on the teacher causes the learning process to be less attractive to students. According to Salman et al. (2019), namely motivation and interest in learning, interaction

between teachers and students, the ability to think critically and solve problems by students, critical thinking skills, and learning models. Thus, the interaction between teachers and students must be more active.

In this context, this study will allude to problems in one of the subjects that are considered difficult and complicated by most students, namely mathematics. This is proven by the existence of learning mathematics in some students who think mathematics is a difficult subject with complicated formulas. Based on the results of observations at one of the Madrasah Tsanawiyah in Sumenep district, namely MTs. Nasy-atul Muta'allimim Candi, to be precise in class VIII there are several factors that cause low student activity and learning outcomes in mathematics, especially on the subject of flat sided geometric shapes which are relatively low.

Building flat sides is one of the topics studied in eighth grade of junior high school in the even semester, this mathematics topic includes cubes, blocks, prisms and pyramids. The low learning outcomes of eighth grade students of Islamic junior high school. One of problems is caused by students' lack of interest in learning mathematics. Students think that mathematics is a difficult subject and full of formulas, so that students find it difficult to understand the material. Besides that, the low student learning outcomes are also caused by the learning model used by the teacher, which is less attractive and monotonous. In this case, the teacher pays little attention to the learning strategies used and the teacher does not relate mathematics subjects to everyday life so that students feel bored and bored in teaching and learning activities. In fact, in the material for flat side shapes, many things or examples related to everyday life are found.

To overcome this problem, the research will be carried out to improve student learning outcomes by using a learning model, namely the Realistic Mathematics Education (RME) learning model. Asmin (in Rohayah and Kurniawati, 2009: 8) argues that Realistic Mathematics Education (RME) views Mathematics as an activity related to everyday life or in accordance with reality.

Through the Realistic Mathematics Education (RME) approach, besides being expected to improve student learning outcomes in learning mathematics and provide new solutions in the learning process that is different from what has been done conventionally. This RME approach in the presentation of learning material and the learning atmosphere will be better and more effective in learning mathematics. So, based on the description of the background that has been described previously, the research will focus with the title Implementation of Realistic Mathematic Education (RME) Model to Improve Learning Outcomes in Polyhedron. Meanwhile, the purpose of this study was to improve the learning outcomes of MTs Nasy-atul Muta'allimin students in mathematics.

METODE

This research includes Classroom Action Research, where the subjects of

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the research were all students of class VIII-B in Even Semester 2022/2023 Academic Year at Islamic Junior High School Nasy-Atul Muta'allimin Candi with 20 students. At the research design Implementation of the Realistic Mathematical Education (RME) learning model to improve student learning outcomes on the subject matter of polyhedrons was carried out in two cycles. The learning material that will be taught in cycle I is the surface area of cubes and blocks. While the learning material that will be taught in cycle II is the volume of cubes and blocks, using the spiral model of Kemmis and Taggart developed by Stephen Kemmis and Robin MC Taggart which consists of several cycles and each cycle uses four action components, namely: 1) Planning, 2) Implementation, 3) Observation, and 4) Reflection (Arikunto, 2014: 132)

Observation of student activity is carried out by two observers. One math teacher at Islamic Junior High School NAsy-Atul Muta'allimin Candi and one colleague. In this research, the data collection techniques by observation, questionnaires, and tests. To obtain student activity data, namely through direct observation during learning by observers based on observation sheets in assessing student activity, student responses to the Realistuc Mathematical Education (RME) learning model were obtained by giving questionnaires to students, and administering tests to find out students learning outcomes. After the data is collected, data analysis is carried out.

The analysis was carried out with the aim of conclusions about student activities, using the formulaNA $=\frac{\sum n}{\sum a}$. Student responses can be seen using the Student Response Percentage formula = (Number of Students Who Answered YES)/(Number of Students) x 100 %, student responses are said to be positive if the average percentage of student answers is ≥60%. While student learning outcomes are said to be complete if they have reached a minimum of ≥70, and are said to be classically complete if they have achieved a minimum of 75% using the standard score formula = (Number of Completed Students)/(Number of All Students) x 100%.

RESULT AND DISCISSION

The results of observations of student activities during the application of the Realistic Mathematical Education (RME) learning model on the subject of flat sided geometric shapes can be seen from Table 1 below:

Table 1. Final Results of Student Activities in Cycle I and Cycle II

Cycle I		Cycle II	
Meeting I	Meeting II	Meeting I	Meeting II
2.92	3.10	3.01	3.47

Student activities in participating in learning the application of the Realistic Mathematical Education (RME) model to improve student learning outcomes at Islamic Junior High School Nasy-Atul Muta'allimin on the subject of flat sided geometric shapes for class VIII experienced an increase of 0.23 with an activity value in cycle I has an average of 3.01 and in cycle II it has an average of 3.24 in the good category. More details

can be stated in the following diagram on figure 1.

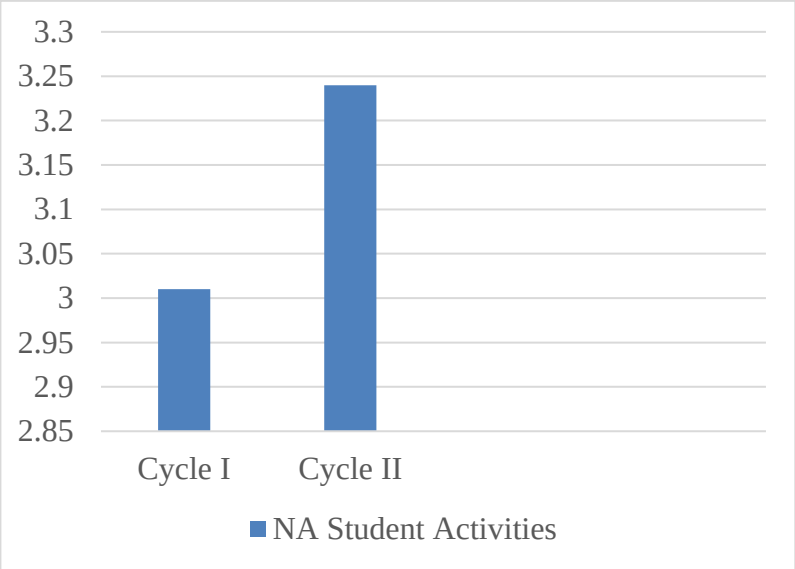

Figure 1. Observation Results of Student Activities

Student responses in learning using the Realistic Mathematical Education (RME) model experienced an increase from cycle I to cycle II with the percentage of students answering "Yes" of 60.71% while the percentage of students in cycle II was 85.71%. Because the average percentage of students from cycle I to cycle II who stated "Yes" was ≥60%, this indicates that the student's response to the Realistic Mathematical Education (RME) learning model was positive. More details are stated in the following diagram on figure 2.

Student learning outcomes both individually and classically, there is an increase from cycle I to cycle II. In cycle I, there were 12 students who completed individual studies, while 8 students did not complete. For classical test scores in cycle I, the success target was not reached, namely Standard score =

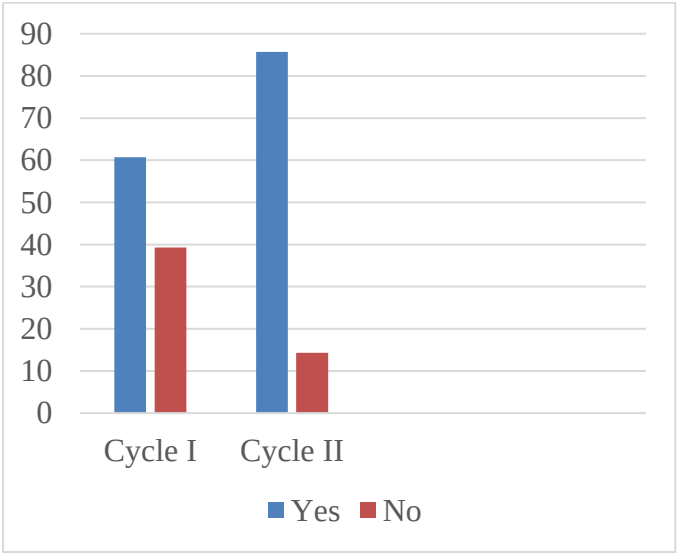

Figure 1. Student Response Results

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(number of students who completed)/(total number of students) × 100% = 12/20 × 100% = 60% with an average of 65.8 . In cycle II, 16 students completed and 4 students did not complete learning individually. This means that improvements in cycle II produced results, namely Standard score = (number of students who completed)/(number of all students) × 100% = 16/20 × 100% = 80% with an average of 78.4. In cycle II it is said to be classically complete because the percentage obtained is ≥75%. The increase from cycle I to cycle II was 20% of students who completed classically. More details are stated in the following diagram on figure 3.

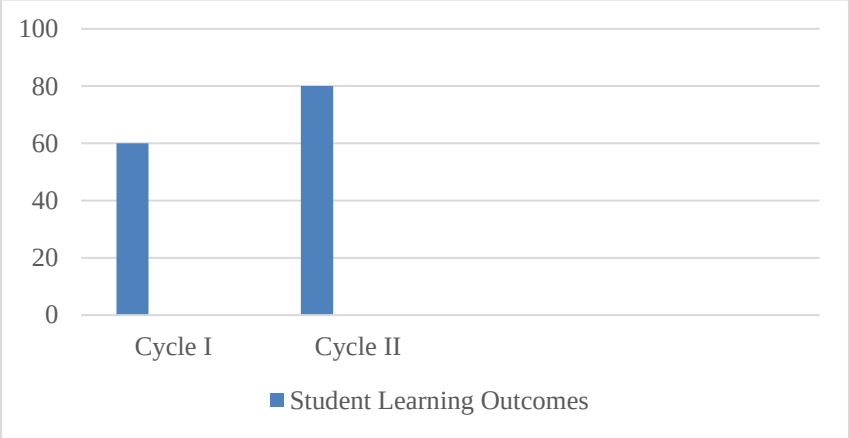

Figure 3. Student Learning Outcomes

Based on data during initial observations at class VIII-B Islamic Junior High School Nasy-Atul Muta'allimin school where the number of students was 20 people, the percentage of student test scores in mathematics was very low. And the low student learning outcomes according to the teaching teacher are influenced by the lack of understanding and student interest in mathematics. In addition, according to researchers, the low student learning outcomes are also influenced by the learning methods used by teachers, where during the learning process it feels dominated by teachers and students tend to be passive and also lack of linking mathematics subjects with everyday life. After reviewing the results of classroom teacher interviews, researchers are interested in taking action on students by applying the Realistic Mathematical Education (RME) learning model to improve student learning outcomes.

Realistic Mathematics Education is a student-centered approach to learning Mathematics, Asmin (in Rohayah and Kurniawati, 2009: 8) argues that Realistic Mathematics Education views Mathematics as an activity related to everyday life or in accordance with reality. Problem-based learning is a learning model designed and developed in order to develop students' ability to solve problems (Shaputri, Marhadi, Antosa, 2017).

The results showed that there was an increase in student learning outcomes by applying the Realistic Mathematical Education (RME) learning model on the subject of flat sided geometric shapes

from cycle I to cycle II. In cycle I students still seemed unfamiliar with the use of the Realistic Mathematical Education (RME) learning model. There are still some students who are less focused during learning, this is caused by a lack of student motivation and student interest in learning mathematics.

Therefore, in cycle II at the beginning of learning the researcher gave motivation to students, so that students became more active and focused. The lack of connection between mathematics material and students' realities then makes most students have low motivation to learn mathematics. For this reason, learning motivation needs to be instilled in students.

During learning mathematics, teachers need to plan and prepare what can make students motivated to learn mathematics, for example giving added value if the student answers the teacher's questions correctly, giving applause if students play an active role in learning and so on. The learning motivation is the tendency of students to carry out a learning activity that is driven by a sense of desire to achieve maximum achievement or learning outcomes.

Also Khodijah (2014) explains learning motivation is the energy within the individual that can encourage a person to do all their activities for a certain purpose. Researchers also put more emphasis on the use of the Realistic Mathematics Education (RME) learning model by asking students or representatives from the group to hold objects in the shape of rectangular blocks and the researchers also invited students to discuss so that their attention was not distracted . As well as researchers also provide motivation to students, so that students become more active and focused. One of the advantages of the Realistic Mathematics Education (RME) model is that students can experience the benefits of learning because the problems faced by children are associated with real life, this can increase motivation and interest in the material being studied (Santiani, Sudana, Tastra, 2017).

Thus the efforts to improve student learning outcomes carried out by researchers ultimately went smoothly after the actions were carried out in cycle I and cycle II, with the cooperation and guidance provided by the teacher and researcher, this could be resolved properly. In general, the researcher succeeded in managing the class and making the students active.

Success in student learning outcomes in the cognitive domain, which is analyzed using the test method, is realized if students are able to master the material seen from student scores when working on test questions that meet the Minimum Completeness Criteria. In cycle I the average score of students in 1 class was 65.8, with 12 students achieving standard score or classically 60%. Then in cycle II the average cognitive value of students increased to 78.4 in one class with the number of students who achieved standard score as many as 16 students or 80% classically. The data shows that the number of students who mastered the subject matter thoroughly (N ≥70 individually) and more than ≥75% classically.

Based on the results of student observations to find out learning outcomes in the effective and

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psychomotor domains, it is realized if students are able to carry out the affective and psychomotor domains required in the learning process, through observations (observations) carried out by 2 observers (Mr. Nur Mahyudi, S.Pd and Qurratul Faizah) during the learning process. The results of the actions in cycle I, namely 3.01, then increased to 3.24 in the good category.

Increasing student responses to the Realistic Mathematics Education (RME) learning model was seen through a questionnaire. It is said to increase if it meets the positive criteria, namely 60% in 1 class. The results obtained in the first cycle, namely 60.71%, and the second cycle obtained 85.71% in the positive category. So, it can be said that increasing student learning outcomes by applying the Realistic Mathematical Education (RME) learning model on the subject of flat sided geometric shapes is successful and well used.

CONCLUSION

After conducting research on the application of the Realistic Mathematical Education (RME) learning model to improve student learning outcomes at Islamic Junior High School Nasy-Atul Muta'allimin on the subject of flat sided geometric shapes, it can be concluded as follows:

1. In learning using the Realistic Mathematical Education (RME) model on the subject of flat-sided geometric shapes, it shows an increase, both individual and classical mastery. In the first cycle, there were 12 students who were declared complete as individuals, while in the second cycle, there were 16 students who were declared complete individually. The classical value in cycle I has not reached the target of success, which is 60%. However, the improvement in cycle II yielded results, increasing to 80% classically and achieving the target of success, namely ≥75%.
2. Student responses to the application of the Realistic Mathematical Education (RME) learning model on the subject of flat sided geometric shapes also increased, namely the percentage of students who answered "Yes" in cycle I was 60.71% and in cycle II to 85.71%, both of which were categorized positive.
3. Student learning activities during the process of implementing the Realistic Mathematical Education (RME) learning model on the subject of flat sided geometric shapes experienced an increase from cycle I to cycle II, namely 3.01 to 3.24 in the good category.

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BRIEF PROFILE

Hozaima was born in Sumenep on February 3rd, 2000. He graduated with a bachelor's degree from mathematics education at Madura University in 2023. He is a mathematics teacher at Nasy-Atul Muta'allimin Candi.

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