

THE IMPLEMENTATION OF REALISTIC MATHEMATICS EDUCATION (RME) TYPE STUDENT TEAMS ACHIEVEMENT DIVISION (STAD) TO IMPROVE STUDENTS' COMMUNICATION ABILITIES

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ABSTRACT

This study aims to describe the implementation of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) to improve students' communication abilities. This research is a Classroom Action Research (CAR) conducted in 2 cycles. Each cycle consists of four stages, namely: planning, implementation, action, and reflection. The subjects in this study were 7th-grade students of SMPN 2 Kalianget as many as 30 students. The data collection techniques used in this study were observation, tests, interviews, and documentation. Data analysis used data reduction, data presentation, and concluding. The results showed that students' activities and average test results increased from cycle I to cycle II. The results of the observation of students' activities in the first cycle an average of 64.76% increase in the second cycle to an average of 90.00%. The test results in the first cycle were completed by 21 students (70%) with an average score of 70.30 and increased in the second cycle which were completed by 26 students (86%) with an average score of 80.83. The conclusion of this study was that can to improve students' communication abilities.

Keywords: RME, STAD, Student Communication

1. Introduction

Education is a conscious effort in order to create people thinking wisely (Tohir, et al., 2020). Mathematics as one of the subjects holds a significant role in education. Mathematics is a means of thinking to develop reasoning power, logical, systematic, and critical thinking (Saiful, 2019). Mathematics lessons are given to students as a means of improving communication skills. The mathematics communication ability is very important for the students so that they can solve math problems by using good reasoning, illustrate the mathematics ideas into a mathematics model, and then connect the process into various mathematical concepts, into everyday life context, as well as into the other disciplines (Tinungki, 2015). Saiful (2020) stated that there needs to be variety and innovation in learning mathematics so that students feel comfortable in the classroom. Varied, innovative, and interesting learning methods make the learning process of mathematics in class entertaining for students

(Maswar 2019). Students' communication skills are predicted to increase by implementing the Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD).

Communication in mathematics involves two things, namely written and oral communication. Hodiyanto (2017) states that mathematical communication is a way for students to express and interpret mathematical ideas orally or in writing in the form of pictures, tables, diagrams, formulas, or demonstrations. In line with Pambudi et al (2021) state that mathematical communication skills are the skills needed in conveying understanding, ideas, and arguments both in writing and orally. In more detail, Azmi (2017) explains that written mathematical communication can be in the form of using words, pictures, tables, and so on that describe students' thinking processes. Written communication can also be in the form of problem-solving descriptions or mathematical proofs that describe students' abilities in organizing various concepts to solve problems. While verbal mathematical communication can be in the form of verbal disclosure and explanation of a mathematical idea. Oral communication can occur through

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interactions between students, for example in learning with group discussions.

Efforts to improve students' communication skills in learning mathematics, we need a method that can stimulate students' thinking so that they can respond to learning in class. One approach to learning mathematics that involves more students and makes mathematics feel more real and able to improve student communication is through Realistic Mathematics Education (RME) tipe Student Teams Achievement Division (STAD). Realistic mathematics education is an approach oriented to the reality of daily life as the entry point of learning (Rohman, 2019). Hidayat et al, (2020) explain that Realistic Mathematics Education (RME) is an approach that uses the real world as a starting point for developing mathematical ideas and concepts in contextual problems. Rohman (2019) menjelaskan the steps of this approach cover: First, understanding the contextual problem where the teacher gives a contextual problem. Second, explaining the contextual problem, in this step, the teacher asks the students to explain or describe the contextual problem given by using their own words. Third, solving the contextual problem, the students individually or in group solving the contextual problem by using their own way. Fourth, comparing and discussing the students' answer, the teacher provides time and chance to the students to compare and discuss their answers in the group to be then compared (checking and revising) and discussed to the whole class. Fifth, concluding, from the result of the discussion, the teacher guides the students to draw a conclusion of a concept or procedure.

Student Teams Achievement Divisions (STAD) is one of the procedures that appropriately use the learning and teaching management which mainly focus on students (Rattanatumma, Puncreobutr, 2016). Zakaria (in Ardiyani, 2018) states that, in STAD learning, students are divided into some groups by academic ability, sex, and ethnic, and then teachers deliver material and students work in group to conceive the material to be discussed. In line with Zainur (2018), Student Team Achievement Divisions (STAD) are learning that divides students into small groups of 4-5 students of various abilities, gender, and ethnicity.

The use of the STAD strategy through the RME approach can improve student communication in learning mathematics. Results of research by Yulianingtyastuti (2013) concluded

that the use of the Student Teams Achievement Division (STAD) strategy with the Realistic Mathematics Education (RME) approach in learning mathematics can improve students' conceptual understanding. So as Sutanti et al (2021) concluded that there were differences in cognitive learning outcomes using the STAD learning model and not using the STAD learning model. While the purpose of this study is to describe the application of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) to improve student communication.

2. Research Methods

This research is a Classroom Action Research (CAR), namely research that combines the characteristics of descriptive and experimental research. According to Arikunto (2015) Classroom Action Research is research that describes the cause and effect of treatment, as well as describes what happens when the treatment is given and describes the entire process from the beginning of the treatment to the impact of the treatment. This study uses two variables, namely the implementation of Realistic Mathematics Education type Student Teams Achievement Division and students' communication skills. The research location is at SMPN 2 Kalianget. The subjects of this study were 30 students of class VII-2 at SMPN 2 Kalianget.

This study uses a two-cycle Classroom Action Research with Kurt Lewin's model which consists of four stages, namely: planning, implementation, observation, and reflection. Data collection techniques using observation, tests, interviews, and documentation. Observations were made when learning activities took place in class. The test is used to determine the increase in student learning outcomes after the learning process. Interviews are used to find a problem as well as to find out how far students understand the methods applied during learning. While documentation is used to capture learning events as evidence to strengthen the validity of data. Data analysis in the form of data reduction, data presentation, and concluding.

3. Results and Discussion

The implementation of Realistic Mathematics Education teaches mathematics by providing examples using everyday experiences. The Student Teams

Achievement Division method is applied by dividing students into several groups to discuss with each other so that students' communication skills have increased. Students begin to respond and respond when learning takes place. This can be seen from the results of observations of student activities and test results in cycle I and cycle II.

Cycle I

There were three aspects observed in the observation of student activities in the first cycle. Activity I, use symbols and equations in mathematics. Activity II, discussion activities between groups. Activity III, presentation and response to individual or group work. Student activities are divided into 3 categories, as follows: Less Active (0% – 69%), Active (70% – 89%), Very Active (90% – 100%).

The results of the observation of student activities in the first cycle showed that the achievement of the three aspects observed was still less than optimal. This can be seen from the average value of the observation results of student activities obtained. In activity I it was 57.14%, in activity II it was 62.86%, and in activity III it was 74.28%. Based on the average value obtained, of course, activities I and II still show the less active category. While in activity III, it has shown an active category. So it can be concluded that the results of observing student activities in the first cycle are still not optimal because the use of mathematical concepts and discussions that occur in students are still less active.

While the test results in the first cycle showed that 21 students were completed (70%) and 9 students were not completed (30%). The average result of the test score is 70.30. Students are said to be complete when the score has reached the Minimum Completeness Criteria which is 72. From the test results, students are divided into three categories based on their ability level, namely students with high, medium, and low abilities.

From the results of observations and test results that have been obtained in cycle I, the next stage is the reflection stage which produces the following conclusions:

- a. Limited time so that some students are not able to solve the problem completely.
- b. Only a few students are actively participating in learning.

- c. Some students hesitate to ask if there are difficulties with the questions.
- d. The increase in students' communication skills is still less than the specified target.

Based on the results of student activities observations and tests obtained in the first cycle, it is necessary to make some improvements so that the researcher decides to continue learning from cycle I to cycle II.

Cycle II

The results of observing student activities in cycle II showed that students understood more about the application of mathematical concepts. Students are more active in conducting discussions. Express ideas and respond to group work presentations. This can be seen from the average value of student activity observations. In activity I it was 91.43%, in activity II it was 84.28%, and in activity III it was 94.29%. The results of observations of student activities obtained, it shows an increase in cycle II.

While the test results in the second cycle showed that 26 students were completed (86%) and 4 students were not completed (14%). The average result of the test score is 80.83. As in cycle 1, students are said to be complete when the score has reached the Minimum Completeness Criteria (KKM) which is 72. From the test results, students are divided into three categories based on their ability level, namely students with high, medium, and low abilities.

From each category of high, medium, and low ability levels one student was selected to be interviewed. The following is the subject of each category.

Table 1. Subject's Ability Level

Code	Subject	Score		Level
		Cycle I	Cycle II	
S-1	DA	85	90	high
S-2	LA	75	80	medium
S-3	NW	40	65	low
Average		70,30	80,83	

Based on the table above, shows that there are differences in test results in cycle I and cycle II. Each category of the high, medium and low ability levels showed an increase in test results from cycle I to cycle II. This shows that the implementation of Realistic Mathematics Education (RME) type Student Teams

Achievement Division (STAD) has increased test results from cycle I to cycle II.

Some students who did not finish because they had not been able to understand the material given, and felt embarrassed to ask the teacher or their friends. So those students are confused in doing and finding answers to the questions given. This can be seen from the results of the answer sheets and student interviews from each category of ability level, as follows:

1. High Ability Students

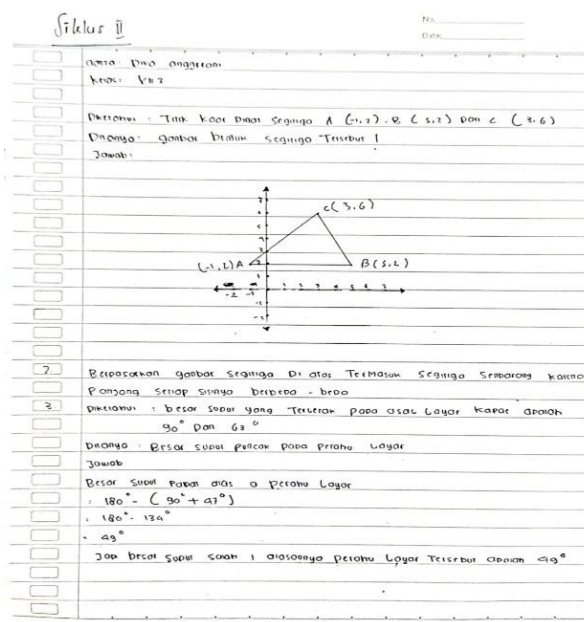


Figure 1. Test Answers from S-1

The results of the answer sheet above show that S-1 understands the questions that have been given. But the availability of a short time makes the S-1 not perfect in completing its work. This was proven when he said, "Actually there was no difficulty, it's just that the time was too short so I didn't finish working on it, ma'am". Understand how to determine the coordinates of the point using the Cartesus line. And understand the steps to solving the problem.

2. Medium Ability Students

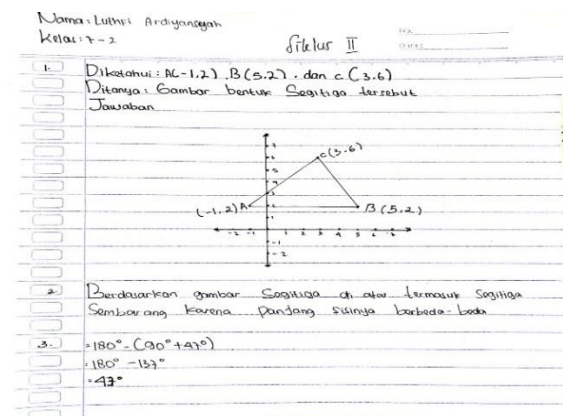


Figure 2. Test Answers from S-2

The results of the answer sheet above show that S-2 does not understand the questions given. Do not understand the steps for solving the story problem. Lack of understanding of how to determine what is known and asked in the question. This was acknowledged by the master during an interview "to determine what was known and asked. Sometimes you can, sometimes you don't, ma'am. It depends on the matter." But already able to draw a Cartesian line and determine the coordinates.

3. Low Ability Students

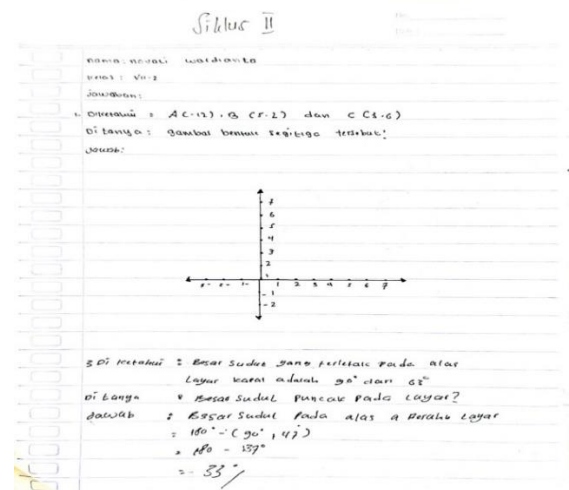


Figure 3. Test Answers from S-3

The results of the answer sheet above show that S-3 does not understand the questions given. Difficulty in finding steps to solve the problem. And can't draw a Cartesian line perfectly. When experiencing difficulties, S-3 tends not to ask questions and chooses to remain silent. Because according to the doctor's confession, he was

ashamed if he had to ask the teacher or other students.

Based on the explanation above, it can be seen that there are differences in the abilities of the three students who have been selected based on their level of ability. So students' communication skills also affect the mathematics learning process. The following is a diagram of the comparison of observation results and test results in cycle I and cycle II:

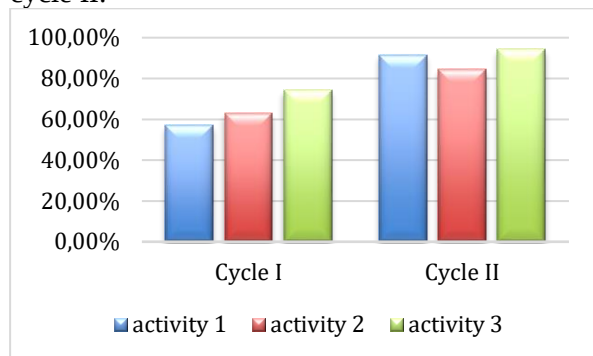


Figure 4. Students' Activities Observation

Figure 4 shows that there is an increase in each activity from cycle I and cycle II. This proves that the application of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) in learning mathematics makes the atmosphere in the classroom more lively. In addition, mathematical concepts are also easier for students to understand, because the teacher gives a real picture directly. Groups and mutual discussions also make students learn to be confident in conveying their ideas. Through discussion, students can also learn to respect the opinions of others.

So it can be said that the implementation of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) in learning mathematics can improve communication in learning mathematics. Student activities to apply mathematical concepts or equations, discuss with each other, find answers, and respond to discussion results. The three aspects observed continue to increase. So that this method is considered appropriate to be applied in every mathematics lesson.

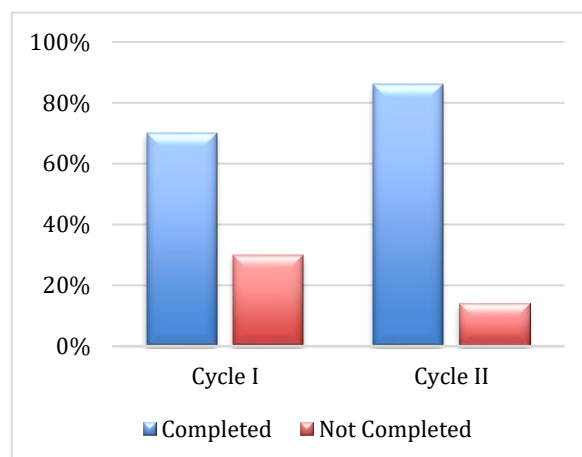


Figure 5. Student Test Results

Figure 5 shows that there is an increase in student test results in cycle I and cycle II. This proves that the implementation of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) can improve student test results. In the first cycle, there were 21 students with an average score of 70.30 (70%) and in the second cycle, 26 students completed with an average score of 80.30 (86%). While those who did not complete each cycle decreased, in the first cycle there were 9 students who did not complete it (30%) and in the second cycle it decreased to 4 students (14%).

4. Conclusions

Based on the results of this classroom action research, it can be concluded that the implementation of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) can improve students' communication skills in learning mathematics. This can be seen from the results of observations of student activities which increased in cycle I and cycle II. The result of activity I increased from 57.14% to 91.43%, the result of activity II increased from 62.86% to 84.28%, while activity III increased from 74.28% to 94.29%.

The implementation of Realistic Mathematics Education (RME) type Student Teams Achievement Division (STAD) can improve student test results. This can be seen from the test results in the first cycle with an average value of 70.30 (70%) increasing in the second cycle to 80.30 (86%).

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