



Improving Learning of Addition Count Operation through Realistic Mathematics Education Approach for Mildly Retarded Children: Classroom Action Research VII SLB Autisma Mutiara Bangsa Pratama Padang

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Abstract

The purpose of this study was to improve student learning outcomes by applying Realistic Mathematics Education (RME) in addition material in class VII SLB Autisma Mutiara Pratama. The research method used was classroom action research together with the class teacher at Mutiara Mutiara Autism SLB and two students in this study including mildly retarded. Researchers used data collection techniques through observation, testing, and documentation. The evaluation tools used mean observation and learning outcomes tests and data analysis techniques with quantitative descriptions and qualitative data analysis. The results of the study are described by each cycle. Each cycle is divided into four stages, namely planning, implementation, observation and reflection. According to the results of this study, the use of the mathematics education approach (RME) VII grade students can also improve student learning outcomes through media and linking to everyday life. The average percentage of observation results of student activity cycle I = 68%, Cycle II = 82% while the average percentage of pre-cycle student learning outcomes = 30%, cycle I = 45%, cycle II = 75%.

Keywords: Realistic Mathematics Education (RME), Addition, mildly retarded children

Introduction

Education is an effort to create a perfect human being. The purpose of education is to make a perfect human being, in the sense of a human being who at the same time builds the state and nation. A person can develop their potential and improve their ability to overcome future obstacles with education. Students with special needs have the same rights as other students. They are also entitled to education

for self-development, one of which is children with mild impairment.

mildly retarded children usually do not have physical problems. Physically, it is difficult to distinguish mildly retarded children from normal children because they look like other normal children. In general, children with mild impairment can follow academic lessons through special programs that have been adapted to the student's abilities. (Iswari, 2013). According to Kasiyati & Kusumastuti (2019) based on

academic barriers that are intellectually hampered are characterized into several groups, one of which is children who experience intellectual barriers in the mild category, namely having an intelligence level of 50-70, for educational information of children with mildly retarded sometimes achieved, when the ability to help themselves, the ability to speak fluently according to the child's current state and talented in doing work.

In providing learning to students with mild disabilities, teachers must oversee the implementation of teaching and learning as well as learning principles so that activities run well. According to (Nurmeliawati, 2016) some principles that must be considered when providing learning to students with mild disabilities include the principle of affection, the principle of demonstration and the principle of disability and rehabilitation as explained (1) The Principle of Affection, Children with disabilities need sincere affection from their teachers when participating in educational activities, in accordance with the Principle of Affection. Teachers should speak gently, be patient, self-sacrificing, and show examples of good, friendly, and sociable behavior to gain students' trust and ultimately inspire them to participate in activities and complete tasks. (2) The principle of demonstration, students with tunagrahita struggle with their ability to think abstractly. Due to these limitations, students with mildly retarded will pay more attention to learning activities that use appropriate props (models) or concrete objects. (3) Principles of Habilitation and Rehabilitation Despite academic limitations, children with intellectual disabilities still have potential or abilities that can be developed in other areas. Habilitation is an effort to teach children that behind their limitations, they still have abilities or potential that can be developed. Rehabilitation is an effort to continuously rebuild lost abilities or develop existing abilities through different means.

Based on the results of preliminary studies that researchers conducted through field observations at Mutiara Bangsa Autism Special School Pratama Padang in class VII, researchers observed when learning activities began until completion. Where students consist of two mildly retarded children named AS and FA. Mathematics is included in thematic learning for children with mild disabilities. When math learning takes place the teacher explains according to KD 4.1, namely performing addition and subtraction operations of two numbers up to 100. There are several ways to improve the quality of math teaching between the classroom and the real world, such as by improving teaching methods, improving the quality of teachers who teach, and so on. There are several things that can be done to achieve this, but one of the most important is to create a learning environment where teachers teach and apply learning strategies (Taufan, 2018). Teachers can make efforts to make learning fun and meaningful. If the teacher is able to make a connection between the material taught and students' lives, then learning will be more meaningful. One way to handle math learning with addition operation material that is structured based on students' daily routines and is expected to develop similar learning is the Realistic Mathematic Education (RME) approach.

One of the theories of mathematics learning is called Mathematics Realistic Education (RME) or in Indonesian is Realistic Mathematics Education. RME is an effort to learn mathematics based on the reality of students' daily lives. Students' real-world experiences are the basis of the RME approach, a learning strategy. The RME approach teaches by bringing real-world situations into the classroom and encouraging students to make connections between what they know and how it can be used in real life. Thus, the material taught is easier to understand and more embedded in students' memories, especially in arithmetic

operations, especially in addition operations.

Students' inability to understand abstract math concepts is another problem with the lecture method. This explanation shows that the conventional approach to learning mathematics must be changed, and alternative methods must be sought to help students understand mathematical concepts, especially addition, more easily. By shaping and developing mathematical concepts into phenomena found in the real world, educators can help students understand mathematical ideas. A sensible math school approach is a viable arrangement in learning science. The quality of learning which is also influenced by teacher performance is expected to improve when the Realistic Mathematics Education (RME) approach is used (Susilowati, 2018).

According to Hadi (2017) based on Hans Frudenthal's assumption that RME uses the real world as a starting point for developing mathematical ideas and concepts, students can be meaningfully involved in the learning process in Realistic Mathematics Education (RME). The provision of mathematics learning using the Realistic Mathematics Education approach is expected to improve the ability of mildly disabled students, due to the development of learning provided informally, so that mildly disabled students are asked to solve mathematical answers carried out by question and answer with the teacher in the classroom. The Realistic Mathematics Education approach invites students with mild disabilities to be active and creates a fun class so that they do not focus on what the teacher gives, but what mild disabilities students produce from discussions with the teacher.

The most common way of learning mathematics with RME involves context-oriented problems as the initial stage in learning science. In this case, students engage in horizontal mathematization activities, where they attempt to organize the problem and identify its mathematical aspects. Based on their prior knowledge,

students are free to describe, interpret and solve contextual problems in their own way. By using vertical mathematization (through abstraction or formalization), students reach the concept formation stage with or without teacher assistance. Students can strengthen their understanding of a concept by inverting mathematical concepts back to contextual problems once they have achieved concept formation (Laurens et al., 2018).

Research Methods

The purpose of this study was to improve students' learning outcomes by using the Realistic Mathematics Education (RME) approach on the material of addition calculation operations in class VII SLB Autisma Mutiara Bangsa Pratama. This study used a classroom action research model developed by Kemmis and Taggart. Classroom action research proposed by Kemmis and Taggart (Arikunto, 2010) can be described as a cycle consisting of planning, action implementation, observation, and reflection stages.

Researchers and classroom teachers collaborated in this study. Researchers and classroom teachers collaborate in developing action implementation scenarios. The researcher carried out the action. The researcher's actions were also observed by the class teacher. In class VII, two mildly retarded students with the initials AS and FA became the subject of classroom teacher research. According to Arikunto (2010) the research has stages of the cycle are Plan (planning), Action (action), Observe (observation), and Reflect (reflection). If needed, the stages of the cycle will be revised during the next cycle.

The data in this study were obtained using tests, documentation, and observation as data collection methods. Observation is the process of carefully observing and recording activities in research to collect data. Researchers observed by following and participating in the learning process to achieve the desired results. The test is a verbal and action examination to see how

each individual uses their abilities. An action or practice test is the type of test used in this study. In classroom action research, documents provide evidence that the research actually took place. This research examines the data collected during the research using photographs, documentaries and videos.

This research uses qualitative data analysis and quantitative data analysis. The observation results will be analyzed and adjusted to the observation guidelines and assessment criteria. After all the data is reduced, the data will be interpreted using narratives about the improvement of learning arithmetic addition operations using realistic mathematics education methods. In addition, the data is also described quantitatively in the form of graphs or description tables.

Results and Discussion

This research was conducted over two cycles. Cycle I took place from May 30, 2022 to June 9, 2022, and cycle II took place from June 13, 2022 to July 17, 2022. This research was conducted on two students in class VII at Mutiara Bangsa Pratama Autistic School. Researchers first conducted pretest activities before starting the actual research. This pretest was conducted with the aim of knowing students' understanding of the material to be taught before using the RME approach. The following diagram illustrates the results obtained from the initial test (pretest)

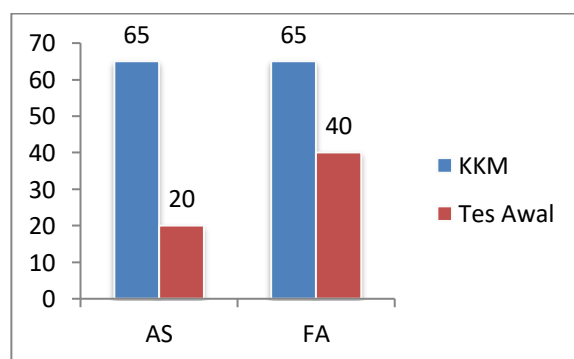


Figure 1: Student's Initial Test Results

Based on the Pretest score data, it can be seen that the AS score reached 20%, and the FA score reached 40%. In general, it can be concluded that the average understanding of grade VII students is not complete, and the KKM is 65. for mathematics, so grade VII students are still below the KKM. These results are because they have not been able to understand the concept of addition during the learning process, and the skill of adding units into tens, resulting in the insertion of tens values. The concept of finding addition through the use of concrete objects can be implemented in classes where the teacher gives more lectures and does not use media, so the learning atmosphere becomes monotonous without feedback. From the results of the PreTest obtained, the average value of students is still below the KKM, so the researcher decided to use the Realistic Mathematics Education (RME) approach to improve the ability of addition calculation operations. This research also collaborated with the class teacher where the class teacher as an observer while the researcher as the implementation of the action.

Cycle I was conducted as many as four meetings. The implementation of the action was adjusted to the format of the observation sheet that had been prepared before the research was carried out. In the first cycle the researcher provided action in learning math addition material using the RME approach. The Realistic approach to mathematics can increase students' knowledge competence and skills in addition using real objects or props. Learning implementation is carried out based on predetermined stages. The results of making observations or observations of student activities during learning using a realistic approach. During the learning process, the teacher observed students' learning activities using an observation sheet. Data on student activity results can be seen in the following table:

Table 1. Student Observation Results
Cycle I

Student Name	Meeting I	Meeting II	Meeting II
AS	64 %	71 %	79%
FA	57 %	64 %	71 %
Rata-rata	61%	68%	75%

Table 1 shows that in the first, second, and third meetings there was an increase in student activity during the cycle I learning process. It is evident from the average percentage of 61% at the first meeting which increased to 68% at the second meeting and 75% at the third meeting. The increase in the number of student activities at each meeting because, as evidenced by the activeness of mildly disabled students in participating in the learning process, students began to understand the importance of activity in learning and began to be interested in the learning methods applied. The results for the final test conducted at the fourth meeting compared to the initial conditions before the action was given. Can be seen from the following diagram:

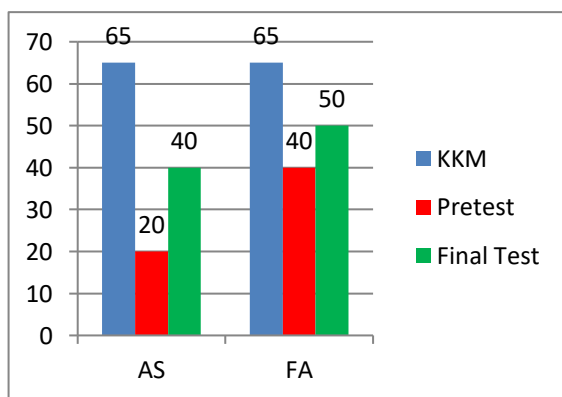


Figure 2. Comparison Diagram of Initial Test and Final Test of Cycle I

As the diagram presented in Figure 2 shows, students' abilities in cycle I have improved, although they have not achieved maximum results. It can be seen that students' abilities in cycle I have improved even though they have not yet obtained maximum results. Student AS got a final test score of 40 while FA got a score of 50. The results of the researcher's reflection on efforts to improve student learning outcomes with mathematics learning on

two-digit addition material. shows students who have not reached the KKM. Researchers together with the class teacher evaluated cycle I by improving it and given more action in cycle II.

As a form of improvement from cycle I, cycle II was carried out for four meetings. Compared to cycle I, whose implementation was adjusted to the format of the observation sheet, the implementation in cycle II was not much different. In the implementation process, students were active and willing to follow the instructions given by the collaborator. The use of the Realistic Mathematics Education approach can be seen from the results of making observations or observations of student activities during learning by using the observation sheet that has been made. Teachers observe student learning activities during the learning process. Data on student activity results can be seen in the following table:

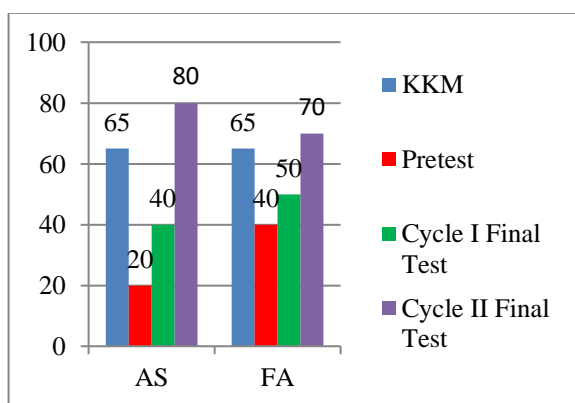
Table 2. Results of Observation of Student Activity cycle II

Student Name	Meeting I	Meeting II	Meeting II
AS	75 %	79 %	86%
FA	79 %	86 %	93 %
Average	75%	82%	89%

Each meeting has increased based on the results of observations of student activity in table 2 during the learning process of cycle II. It can be seen that the number of AS students at the first meeting was 75% which increased to 79% at the second meeting, and to 86% at the third meeting. Meanwhile, FA students were 79% at the first meeting, 86% at the second meeting, and 93% at the third meeting. Each meeting there was an increase in student activity, as well as the average of each aspect observed. This is because students began to realize the importance of activeness in the learning process and began to be interested in learning methods

as evidenced by their enthusiasm for the learning process.

Students are given test questions at the end of the teaching and learning process to find out how well they understand the learning activities. Student assessment depending on students' ability to meet the KKM can be seen in the following diagram:



Picture 3. Diagram of Cycle II End Test Results

Based on the diagram of the test results, students' abilities have improved even though they need guidance from the students. The change in implementation in cycle II is the emphasis on the concept of addition using ice sticks so that the determination of place value in tens and units is more focused. Students are more enthusiastic about participating in math lessons due to changes in this activity. Students' understanding when solving practice problems is influenced by this. Based on the recapitulation of the final test results in cycles I and II, it can be said that students are able to perform addition operations, so the action is stopped in cycle II.

Conclusion

The results of the study can be concluded that students of grade VII SLB Autisma Mutiara Bangsa Pratama find it easier to learn mathematics on the material of adding two numbers by using the Realistic Mathematics Education (RME) approach. This is evidenced by the students' mathematics learning outcomes which

increased in each cycle, namely cycle I and cycle II, each of which was completed in four meetings. Increased student participation in learning mathematics supports the improvement of learning outcomes marked by observing the liveliness of student mathematics learning. Based on data analysis from the class action research, the Realistic Mathematics Education approach can improve the ability of arithmetic operations for mildly disabled students in class VII. However, there were still problems during the learning process, such as the lack of question and answer, which demotivated students. After reflection, the problems were corrected in cycle II, and the mildly disabled students achieved scores above the KKM. The results showed that grade VII students at Mutiara Bangsa Pratama Autistic School with mild mildly retarded could benefit from the application of RME steps to improve their math learning outcomes regarding addition operations. The increase in student activity and the completeness of learning outcomes in each cycle proved this. The average percentage of student activity observation results in cycle I was 68%, while the average percentage of student learning outcomes in cycle I was 30%, and the average percentage of student learning outcomes in cycle II was 75%.

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