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THE EFFORTS TO IMPROVE STUDENT LEARNING OUTCOMES THROUGH RME APPROACH TO MATHEMATICS SUBTRACTION OPERATION IN 4TH GRADE SDN SUKASARI 2

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Abstract

The consequences that can be generated from conventional learning methods are lectures are too dominant, as if the teacher is the only resource person who is versatile, student learning outcomes in mathematics are very low, and the average score is very low. The mathematics score of 4th grade is only 55 while the Minimum Completeness Criteria is 65. With those problems, teachers need to try to increase the learning motivation, so the students learning scores can increase above the predetermined MCC score. One of the efforts that teachers can do is to try to apply the learning strategies by applying interactive learning models. This research uses 2 rounds of classroom action research, and each round consists of four phases, namely; planning, acting and observing, reflecting, and considering. The subjects of this research were 4th grade students of SD Negeri Sukasari 2 and the data used were the daily test scores. The average score of the pre-cycle was 55.48, the first cycle was 69.68, and the second cycle was 87.10.

Keywords: Student Learning Outcomes; Realistic Mathematics Education

A. Introduction

The results of mathematics learning up to now are still a problem that is often echoed by both parents and mathematics education experts themselves. According to Mashudi (2016) Mathematics is one of the basic sciences that has an important role in the effort to master science and technology. The low state of student achievement caused unsatisfactory student achievement. For example, the achievement of students' mathematics achievement at SDN Sukasari 2, especially in 4^{th} grade is still low. The statement was obtained from absorption capacity data obtained at the end of the last semester. The data can also be observed from the average score of the class in the study report card which shows that the mathematics learning is still very low. According to Junaedi (2015), Mathematics namely understanding the basic concepts of mathematics education research based on the character values and conservation.

In line with Nabilah's presentation, T (2019:661) in his research, the low learning outcomes are a natural thing if seen from student activities in learning, especially in mathematics learning. The low activity of students while learning mathematics is an indication that hinders the achievement of the desired results. Budiningsih (2005:16) explained that in general, the teaching and learning process implementation in schools still uses a learning strategy with the lecture approach, so the student involvement level in mathematics learning is still low. Ministry of National Education (1991) explained that mathematics learning in schools has not shown creative learning, challenges children's reasoning and creative power, and has not linked the real problems around students as a vehicle for generating student needs in learning certain materials. In line with the opinion of Sulfemi W.B and Minati H (2018), explained that learning outcomes are knowledge,

behavior, attitudes, or skills that are built by students based on what has been understood and mastered. Besides that, the subject material cannot be used yet as a tool to solve student problems in real everyday life.

From the field observations, the implementation of mathematics learning in the class conducted by the teacher is a delivery of information with students passively listening and copying, the teacher gives examples of questions which are continued by giving some routine practice questions and providing assessments. Meanwhile, Elwijaya, et al (2021), states that meaningful learning for students is carried out with contextual learning or involves realistic problems that are known to students.

Mathematics is one of the fields of study taught in elementary schools. Rahman, A (2018:45) explains that an elementary school teacher who will teach mathematics to students should know and understand the object to be taught, namely mathematics. Russeffendi ET, (1980:148) argues that Mathematics emphasizes activities in the world of ratios (reasoning), not emphasizing the experimental results or mathematical observations formed by human thoughts, which are related to ideas, processes, and reasoning. In other words, mathematics that arises from someone's real experience which has been proven to be true is processed and analyzed analytically with inference in such a way as to form concepts that are easily understood and can be understood by others, processed using mathematical language or mathematical notation (in Rakhmat, 2006:15). That concept is obtained from the thinking result, so logic is the basis for the mathematics formation. We know that the development of a child's reasoning power is different from an adult's. This can be seen clearly in terms of physical, way of thinking, acting, and other habits. Currently, many teachers still teach mathematical concepts according to

their own way of thinking without paying attention to the way students think in understanding the abstract mathematical concepts. Abstract mathematics is considered easy and simple in our formal way of thinking and can be difficult for elementary school students to understand.

Elementary school-age children are children between the ages of 7 and 12 years. According to Jean Piaget (Erna Suwangsih & Tiurlina, 2009), children around this age are still thinking at the stage of concrete operations, which means that elementary school students have not thought formally. Affirmed by Tarigan (2006:34) that the characteristics of children at this stage can understand logical operations with the help of concrete objects, have not been able to think deductively, and think transitively. According to Artika, et al (2019), Realistic Mathematics Education (RME) is a human activity and should be linked to reality. This is in line with the opinion of Shandy (2016) who states that the Realistic Mathematics Education (RME) approach is an approach in which one of the learning methods uses a concrete context or at least can be imagined and real in students' minds.

Mathematics learning in the RME approach includes aspects consisting of posing real problems, the problems given must be in accordance with the objectives, developing an informal symbolic model of the problem, and learning interactively (Iva Sarifah, 2009:47).

In addition, mathematics learning with realistic mathematics education has the advantage of directing students from very concrete conditions through a horizontal mathematization process, the mathematics at this level is informal mathematics (in Suherman, 2003:36). Students are guided by contextual problems. In realistic philosophy, the real world is used as a starting point for developing mathematical concepts and ideas. According to Putri A.R and Irul (2019), the successes or failure of RME approach are depends on

teacher's ability to create the new style for students, whether they will try to think and communicate the progress of the new style.

Saragih (2008:15) explained that in RME students are seen as human beings who have a set of knowledge and experience gained through interaction with their environment. Thus the role of the teacher in the RME approach is only as a facilitator. Teachers must be able to build interactive learning. Teachers should also provide opportunities for students to actively contribute to their own learning process and actively assist students in interpreting the real problems. According to Rosyada, et al (2019), teachers should be able to change the students' mindset, so teachers need a model in learning that can increase students' ability to solve problems in mathematics subjects.

B. Research Methodology

Classroom action research (CAR) was conducted by researchers by applying the Realistic Mathematics Education method. For the analysis of this classroom action research data, researchers used descriptive qualitative analysis techniques, namely descriptive factual research methods that were in accordance with the data obtained with the aim to know the learning outcomes achieved by students, to determine student responses to activities of learning which are also as student activities in the learning process that takes place in the field (in I Made Wirartha, 2006:155).

Wardhani (2008:4) explains that the researchers' position in the classroom action research acts as an active participant. With this, the researchers are actively involved in planning, implementing, collecting data, analyzing in the class, and reporting the research results. According to Kemmis and Mc Taggart (in Kasbolah, 1999:70), each activity taken includes 4 steps, namely: 1. Planning, 2. Implementation, 3. Observation, 4.

Reflection/Evaluation. This Classroom Action Research (CAR) was conducted in 4th grade SDN Sukasari 2, Kaduhejo Sub-district. Mathematics Learning Research related to subtraction operations in 4th grade was conducted in the first semester of the 2018/2019 academic year from August to October by taking 31 students as subjects.

This classroom action research starts from Pre-cycle activities, then Cycle I, and continues in Cycle II. The method in CAR refers to the model proposed by Kurt Lewin which can be described as follows:

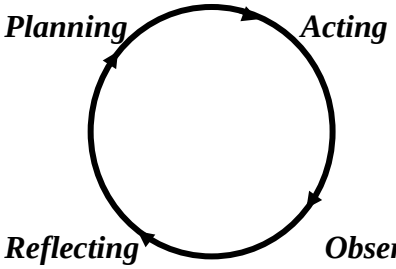

Figure 1. Kurt Lewin's Research Model

Quantitative analysis is an analysis of data obtained from the learning outcomes which can be known its improve through scores with quiz scores and to improve learning outcomes based on observation sheets known through these formulas:

$$P = \frac{\text{Post rate} - \text{Base rate}}{\text{Base rate}} \times 100\%$$

Description:

P = percentage increase

Post rate = average score after action

Base rate = average score before action

C. Result and Discussion

To obtain insight into search results, data is needed. The data are several facts that are used as sources or input to determine conclusions or decisions to be taken. The objects observed are student activities, teacher activities, and student learning outcomes in mathematics.

The pre-cycle research has not given positive results; this

indicates that students' ability to understand the learning material is only limited to identifying arithmetic subtraction operations. The average pre-cycle score was 55.48. This value has not reached the minimum completeness score (SKM) standard set at SD Negeri Sukasari 2.

Then the researchers made an improvement plan to mathematics learning by applying the Realistic Mathematics Education method in cycle I which previously had shortcomings from the researchers' observations results, including:

a. Students pay less attention to the teacher's explanation.
b. Students still have difficulty working on the questions given by the teacher.

Based on the peers' observations, input is obtained in an effort to use concrete examples to generate students learning motivation. In addition, the use of the question-and-answer method makes children more active in the learning process.

The teacher conducted apperception to connect the past lessons and those that will be discussed also attracts students' attention by delivering the material that is useful for everyday life and appreciates students who have the courage to try to ask questions. This is an effort to motivate students' learning when teaching and learning activities occur. At the end of learning, students' learning outcomes are measured by conducting formative tests. The results can be seen in the table below:

Table 1
Pre-Cycle and Cycle I Score Results

No	Student's name	L / P	Assessment		Desc.
			Pre-cycle	Cycle I	
1	Abdul Soni	L	40	40	Not finished
2	Alfian Asadil Alam	L	60	60	Not finished
3	Alzahra Melawati	P	40	40	Not finished
4	Angel Setianingsih	P	60	80	Finished
5	Arjuna Trinanda Fauzan	L	80	80	Finished
6	Citra Meila	P	60	80	Finished
7	Dede Okta Firgiawan	L	40	40	Not finished
8	Dewi Bahyatus Solihat	P	40	60	Not finished
9	Edo Ahmad Fahrizin	L	80	100	Finished
10	Eneng ratu Willia	P	60	80	Finished
11	Ibdu Badar	L	40	80	Finished
12	Ibnu Khaldun	L	40	60	Not finished

13	Jasmin Oktavianti	P	40	40	Not finished
14	Jefri Haryono	L	80	100	Finished
15	Lutfiana Ulfah	P	60	80	Finished
16	M. Fatir Abdullah	L	40	60	Not finished
17	M. Sultan Jaenudin	L	40	40	Not finished
18	Marlan Kurniawan	L	80	100	Finished
19	Moh. Rizky Surya Saputra	L	60	80	Finished
20	Muhamad Efan Ervandi	L	40	80	Finished
21	Muhamad Riza Adillah	L	40	60	Not finished
22	Muhamad Syamsul Siam	L	80	80	Finished
23	Nazwa Aulia Ramadani	P	60	80	Finished
24	Neneng Mustika Aulia	P	40	60	Not finished
25	Rayhan Achmad	L	80	80	Finished
26	Reksa Buzana	L	80	80	Finished
27	Rio Adiansyah	L	40	60	Not finished
28	Rizky	L	60	80	Finished
29	Rizwan Maulana	L	40	60	Not finished
30	Shopiatul Azizah	P	80	80	Finished
31	Sipa Jamilatul Ackia	P	40	60	Not finished
Total			1720	2160	
Average			55,48	69,68	

From the table above, it can be seen that the average score in cycle I were 69.68. This average score is far below the MCC score, which are 65. The number of students who scored more than 65 was 17 students, and those who scored less than 65 were 14 students. So, for students who scored less than the MCC score, it is necessary to improve learning. The researchers describe the Analysis of the Success and Weaknesses of Cycle I as follows:

a. Success

   Giving apperception makes students remember the schemata/initial knowledge that students already have related to the material to be taught. Give examples of steps on how to work on subtraction operations problems.

b. Weakness

   The test questions given are too difficult for students. Students' motivation to learn is still quite low; there are students who do not complete the practice questions until the final answers.

The discussion as a reflection on the observation and analysis of formative test results on the process and results of mathematics learning was continued in cycle II with the aim of learning to improve students' ability to master the material and the results of learning improvements in cycle II.

The improvement plan for mathematics learning in cycle II is as follows:

a. Students are not brave enough to do the practice questions in front of the class.
b. Students cannot answer the teacher's questions.

The most important teacher action in cycle II is to increase the frequency of students who are active in solving problems and actively asking or answering questions, therefore in cycle II uses the practice examples that are in accordance with real-life, before the lesson begins the teacher equips the teaching aids and prepares learning materials and a better observation sheet than in the previous cycle.

After the learning is finished, the students take formative tests and the results can be seen in the following table:

Table 2
Score result in Cycle II

Activities	Total Students	Total Score	Average
Cycle II	31	2100	87,10

As shown in the table above, the test results obtained by students in cycle II showed an increase from cycle I. This can be seen from the average score obtained by students was 87.10. This is supported by student activities in learning. Students understand the problems that must be solved, then search for what is known and asked, and also successfully perform an appropriate calculation. Thus, no further improvement is needed. The researchers describe the Analysis of the Success and Weaknesses of Cycle II as follows:

a. Success

   Increase students' motivation in studying the material. The opportunity to ask questions given by the teacher has increased. The teacher provides guidance to students who work on the practice questions. The score of students learning outcomes is increasing rapidly.

b. Weakness

   Regarding the discussion activities, there are still passive

students who do not interact with other students. In cycle II there are still students who obtain scores below the MCC score.

So overall, the researchers can draw a common thread that the improvement activities in learning through CAR can be considered successful and completed until the second cycle in the teacher's effort to improve students' abilities in solving subtraction operations problems by applying the Realistic Mathematical Education (RME) approach has been successful. But that does not mean that the task of a teacher and student ends there because what is called learning for constructivists, teaching is a form of self-learning (Bettencourt, 1999) is a lifelong activity as the view of progressivism that briefly states learning is life itself, this means that someone who lives in the world must experience a series of situations with these experiences, individuals cannot avoid good interactions between individuals and objects and other community groups.

The results of each cycle can be seen in the diagram below:

Figure 2. The results of data from each cycle

The use of the RME model can help students understand the materials of math subjects. Sari (2015) explains that applying the RME model with concrete media can improve students' understanding of fractions, and improve problem-solving skills (Rosyada et.al, 2019; Noviyana & Fitriani, 2018), Improve ability in reasoning (Gusnarsi & Wahyuni, 2017), improve students' motivation and learning achievement (Nugroho & Kendal, 2018), think creatively (Soraya, Cahyana & Yurniwati, 2018), improve students' mathematics learning outcomes (Mariani, 2014), and can be used as an alternative model for mathematics learning in schools in order to help

students to understand math material and obtain good results (Seri Ningsih, 2014).

D. Conclusion

In the implementation of learning using the realistic mathematics education approach, students are seen as human beings who have a set of knowledge and experience obtained through interaction with their environment. Thus the role of the teacher in the RME approach is only as a facilitator. Teachers must be able to build interactive learning. Teachers should also provide opportunities for students to actively contribute to their own learning process and actively assist students in interpreting the real problems. Teachers are not only focused on the material contained in the curriculum but are able to relate the curriculum to the real world, both physical and social.

The realistic mathematics education method is proven to be able to improve children's abilities and creativity in the concept of subtraction operation. The relevance of the realistic mathematics education approach used by teachers in learning subtraction operations emphasizes the real-world context as a starting point in mathematics learning. Students are faced with the contextual problems that exist in their daily lives. Then students reconstruct mathematical knowledge by paying attention to the context that takes place in a process called guided reinvention. So the mathematics learning obtained does not mean that mathematics is not closed, which is only as a support in mathematics but, mathematics as a human activity in problem-solving and problem finding, but also the activity of organizing the subject material in mathematics learning. The average score of the results of observations and test results in the pre-cycle, cycle I, and cycle II is as follows. The average score in the

Pre-cycle is 55.48 and in cycle I is 69.68. Furthermore, the average score of the class during cycle II is 87.10.

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