Improve Learning Outcomes of Comparing Fractions by using the Realistic Mathematical Learning Approach in Class iii of Public Primary School 040457 of Berastagi

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Abstract

The objective of this research is to determine the Realistic Mathematical Approach in mathematics learning with subject matter of comparing fractions in class III of Public Primary School 040457 of Berastagi. The type of the present study is a classroom action research. Data analysis technique used in this research is quantitative and qualitative descriptive analysis method, with the aim to know whether application of demonstration method can improve the learning outcomes of students. Based on the results of research and data analysis that has been conducted, it is evident that through the application of Realistic Mathematical Approach the learning outcomes of mathematics of students can be improved.

Keywords: Realistic mathematical learning approach; learning outcomes.

1. Introduction

According to Piaget [1], the stages of thinking development of students of primary school are at the Concrete Operational stage i.e.7-11 years old, where in this stage students need learning that is concrete in order to make it easier for them to understand the learning that is delivered.

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Therefore, teachers are expected to provide concrete learning and directly related to the lives of children in their daily life so that learning will be more easily understood and meaningful for learners. As [12] puts it in his research entitled "Learning of Mathematics in Primary School by Using Manipulative Media", mathematics learning is the process of providing learning experiences to learners through a series of planned activities so that learners gain knowledge of mathematics studied.

One of the lessons that require the interrelation between learning and daily life is the learning of mathematics. As proposed by [2], they view mathematics as a human activity related to reality. But apparently it still cannot be well realized in mathematics education, so in the learning of mathematics, students still have difficulty because the teacher only provides abstract learning and rarely associate it with the experience of children in everyday life. The lack of students' understanding of mathematics learning has an effect on the learning outcomes of mathematics of students in schools.

Based on interviews with one of the teachers in class III of Public Primary School 040457 of Berastagi, the following results are obtained:

Table 1: Data on Scores of Mathematics in Class III of Public Primary School 040457 of Berastagi

No.	Learning Year	Minimum Completeness Criteria	Number of Students	Number of Students		Average Score of Students
				Completed	Not Completed	
1	2016/2017	68	48	35 (73%)	13 (27%)	60

(Source: Public Primary School 040457 of Berastagi)

It can be seen from the table above that the results of study of students in Class III of Public Primary School 040457 of Berastagi in Learning Year 2016/2017 average students only reach the score of 60, where only 73% of students that have been completed based on the Minimum Completeness Criteria (MCC) that has been defined i.e. 68 out of 48 students, while 27% of students are not completed. This shows that the learning outcomes are not yet maximal. In general, obstacles encountered in learning mathematics is the difficulty experienced by students in understanding the concepts of mathematics because in the learning of it the teacher has not been able to eliminate abstract impressions.

To overcome these problems, it is necessary a learning approach that is able to eliminate abstract concepts in mathematics learning and can relate learning to the experience of everyday students. Reference [3] states that one of the mathematical learning methods that is oriented to the mathematization of everyday experiences and applying mathematics to everyday life is Realistic Mathematics Learning (RML). Reference [4] suggests that RML is one of the learning approaches that can activate and condition the students to construct their own knowledge by using the models developed by the students themselves.[5] stated that in RML, learning activities start from the real world, so that students can be significantly involved in the learning process. Similarly, Reference [6] states that realistic mathematics learning is basically the utilization of reality and the environment

that learners understand to facilitate the process of learning mathematics, so as to achieve the goal of mathematics education better than the past.

One of the materials learned in mathematics learning in class III of Primary School is fractional number, which according to [7] fractions studied in elementary school is a rational number written in the form of $\frac{a}{b}$ with a and b is Integers and b are not equal to zero. According to Kennedy [7], the meaning of fractions can arise from various situations, namely: 1) fractions as equal parts of the whole; 2) fractions as part of groups of the same number or declare a division; 3) fractions as a comparison (ratio). Reference [8] says that fractions are the same parts of the whole. According to him, the fraction starts from something whole and then broken down into several parts.

The problems in this study are limited to: 1) The low learning outcomes of the third-grade students in Public Primary School 040457 of Berastagi in the subjects of mathematics 2) the learning approach has not been able to relate learning to the students experience in daily life thereby reducing their interest to learn.

Based on problem restrictions, then the problem formulation in this research is as follows: Is Realistic Mathematics Approach can improve student learning outcomes on subjects of mathematics in class III of Public Primary School 040457 of Berastagi?

This study aims to improve the learning outcomes of mathematics in the subject matter of comparing fractions using Realistic Mathematical Approach in the third-grade students of Public Primary School 040457 of Berastagi.

Furthermore, this research is expected to be useful for students especially in class III of Public Primary School 040457 of Berastagi which is to increase student's learning interest so that it can influence on learning outcomes of them.

2. Research method

Type of Research

The type of the present study is Classroom Action Research (CAR). Classroom Action Research (CAR) is one type of research that describes processes and outcomes, which perform CAR in the classroom to improve the quality of learning [9].

Place and Time of Research

This research was conducted on the third grade students of Public Primary School 040457 of Berastagi in Learning Year 2015/2016. The study was conducted on even semester for two months from March 2017 to May 2017.

Subject and Object of Research

The research subjects in this Classroom Action Research were the third-grade students of Public Primary School 040457 of Berastagi with a total of 48 consisting of 26 male students and 22 female students. The object of this study is the improvement of mathematics learning outcomes in the subject matter of comparing fractions using Realistic Mathematics Approach in the third-grade students of Public Primary School 040457 of Berastagi in Learning Year 2016/2017.

Procedure

This research uses Class Action Research (CAR) of Kemmis and McTaggart model [10] consisting of four components in each cycle, namely planning, implementation of action, observation and reflection.

Data Collection Technique

A data collection technique used in this study is test, observation and documentation. The test is used to collect data on cognitive learning outcomes or student knowledge.The instrument used consists of items of question in the form of filling. Observations are used to collect data on student activities during the learning process.The instrument used is an observation sheet of the students. The documentation in this research is the photographs that show the description of the activities of teachers and students in carrying out the learning process.

Data Analysis Technique

Reference [1] states that there are two kinds of data analysis, namely descriptive analysis of quantitative and qualitative. Quantitative descriptive analysis is used to analyze data in the form of numbers, while qualitative descriptive analysis is used to analyze data in the form of information. The results of the test were analyzed by quantitative descriptive analysis. For the test results of students in each cycle the average value and percentage of completeness is calculated for all students, then this result is compared with the score in the previous cycle. The results of observations of student activities during the learning process were analyzed by quantitative descriptive analysis. Data is presented in table form and the percentage is calculated.

3. Results of research and discussion

Here is the data on the results of classroom action research concerning the use of Realistic Mathematics Approach on subjects of mathematics in the subject matter of comparing fractions that are conducted in class III of Public Primary School 040457 of Berastagi in Learning Year 2016/2017.This research was conducted for 2 cycles with 1 cycle every 1 session with time interval between cycles 1 and 2 is 1 week.

Table 2: Learning Outcomes in Cycle I and Cycle II

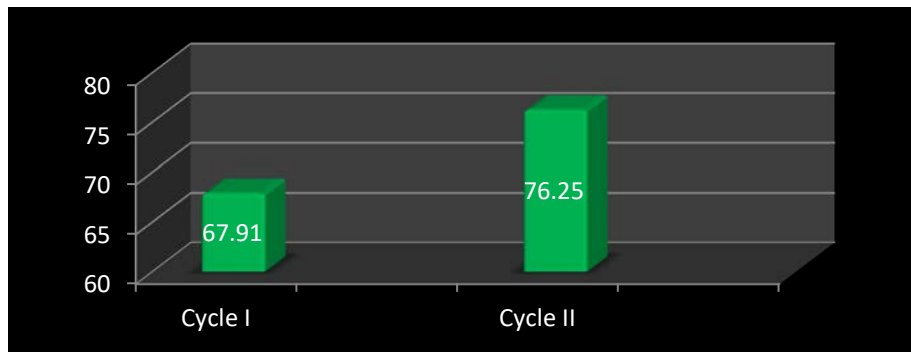| No	Aspect	Cycle I	Cycle II
1	Average score	67.91	76.25
2	Percentage	54.16%	87.5%

Figure 1: Data on Average Score if Presented in a Figure

Table 3: Data on Classically Completeness if Presented in a Table

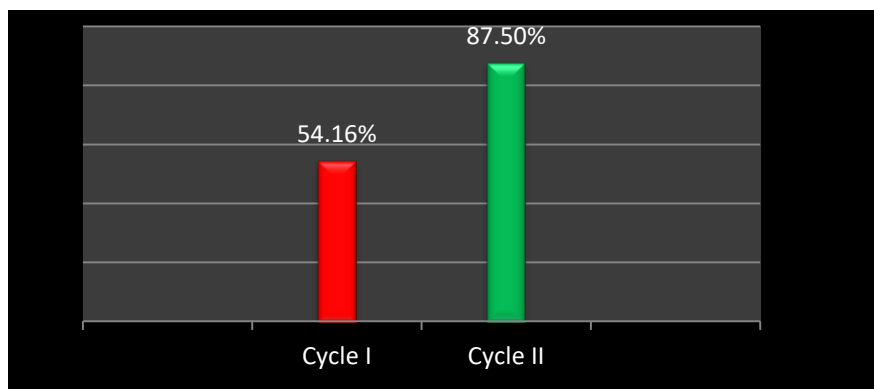| No	Aspect	Cycle I	Cycle II
1	Classically Completeness	54.16%	87,50 %

Figure 2: Data on Classically Completeness if Presented in a Figure

Based on the picture above it appears that there is an increase in the learning outcomes of students from cycle I to cycle II, where from the learning that occurred in the cycle I the average learning outcome of students only 67.91 while in cycle II the average learning outcomes of students reached 76.25.

The increase in the average learning outcomes of students also affects the percentage of students who complete the learning from cycle I to cycle II where in cycle I obtained the percentage of students who complete the learning that is equal to 54.16% while in cycle II students who complete the learning reached 87.50%.

In addition to learning outcomes, this study also wants to determine the increase in student learning activities and teacher activities where the results obtained are as follows:

Table 4: Results of Observation of the Students in Cycles I and II

No	Aspect	Cycle I	Cycle II
1	Activities of Students	54.54	81.81

If presented in the form of the Figure then the results of student activities in cycles I and II are as follows:
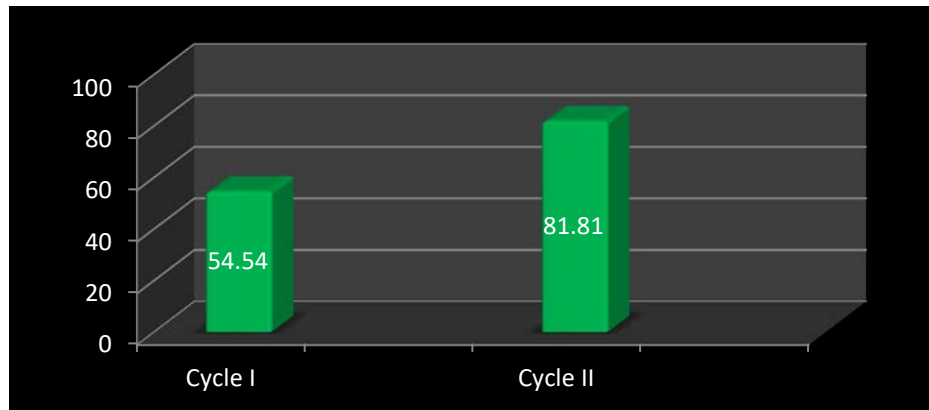

Figure 3: Activities of Students in Cycles I and II if Presented in the Form of Figure

From the picture above can be seen that there is an increase in activities of students, where for the activity of students in cycle I result of 54.54 is obtained while in cycle II there is an increase to 81.81.

4. Discussion

According to the cognitive theory put forward by Piaget [1], the stage of thinking development of primary school students is at the stage of Concrete Operational i.e. 7-11 years old, where in this stage students need learning that is concrete in order to make it easier for them to understand the learning that is delivered. It is expected that in the ongoing learning the teacher can relate the learning materials taught in the school to the student experience.

One of the learning approaches that relate learning to student experiences is the Realistic Mathematics Approach (RMA).In RMA approach that relates learning materials to the students experience will be an increase in students' understanding and learning is not just a memory or memorization that resulted in students will not quickly forget.

Theoretically Realistic Mathematical Approach is a learning theory developed specifically for mathematics. With the Realistic Approach of Mathematics students will be associated with direct experience to find solutions to problems related to the subject matter of comparing fractions. It can increase students' understanding of the material. In accordance with the study [5] entitled "*The Application of Realistic Mathematics Education Approach In Teaching Mathematics in Penfui Kupang*" which indicates that the Use of Realistic Mathematical

Approach (RMA) can improve the mastery of concepts by students in learning mathematics in class V-B Of Primary School Catholic St. Arnold of Penfui Kupang.

Reference [15] in his research (2011) entitled "Improving the Mathematical Critical Thinking Ability of the Students of Junior High School by Realistic Mathematical Approach" suggests that a Realistic Mathematical Learning approach can improve students' mathematical critical thinking skills. Another study conducted by [16] under the title "The Effect of Realistic Mathematics Education on Students' Conceptual Understanding of Linear Programming" shows that there is a significant difference between the treatment group and the control group in conceptual understanding.

In addition, the results of a study conducted by [12], entitled "*Development of Learning Matter of Number Based on Realistic Mathematics Education for the Fifth Grade Students of Primary School*" is also in line with the present study. The results of the tests given to the students during the learning seen from the teacher's comments, student comments, and the ability to solve the problems given, indicate that the students are very enthusiastic and happy in learning so that students are brave to communicate the results of their work, students also give a positive attitude toward learning mathematics that appear from their comments, as well as student ability tests that show good results. This study is in line with research conducted by [13] entitled "*Developing the Skill of Solving Mathematics in Primary School Students*." Overall, an improvement in students' mathematical problem-solving abilities using a realistic mathematical approach in learning is better than those using conventional approaches. In accordance with research by [14] entitled "*The Influence of Realistic Mathematics Learning on Mathematics Learning Outcomes Viewed From Learning Motivation*" it is true that the learning outcomes of students taught by Realistic Mathematical Approach are significantly higher than those taught by conventional approach.

5. Conclusions and suggestions

5.1 Conclusions

Based on the results of research and discussion that has been done, it can be concluded that:1) The use of the Realistic Mathematical Approach in the subject comparing fractions in the third-grade students of Public Primary School 040457 of Berastagi can improve the learning outcomes of students. This is evidenced by the increase in average score of class and percentage of completeness of students in each stage of the study. In cycle I it turns out that the average learning outcome of students is only 67.91 while in cycle II the average learning outcome of the students reaches 76.25.The average increase in the learning outcomes of students also affects the percentage of students who complete the study from cycle I to cycle II, where in cycle I percentage of students who completed learning is equal to 54.16% while in cycle II students who complete learning is reaching 87.50%.2) The use of the Realistic Mathematical Approach in the subject matter of comparing fractions in the third-grade students of Public Primary School 040457 of Berastagi can also increase the learning activity of the students. This is evidenced by the increase in the percentage of student activity during the learning process. For student activity in cycle I the result obtained is 54.54 while in cycle II there is an increase to 81.81.Thus, the activity of students in cycle II has belonged to category of good.

5.2 Suggestions

Based on the above conclusions, as a follow up of the research results then some suggestions are submitted as follows:

1. In order to implement the learning, teachers should be able to apply the Realistic Mathematical Approach as an alternative to improve learning outcomes in the subjects of mathematics with the subject matter of comparing fractions, because through Realistic Mathematical Approach the students can play an active role so that the learning process will be interesting and will also affect the learning outcomes of students.

2. Students should be able to increase their creativity in learning and be more active in teaching and learning process.

3. For the principal, the results of this study serve as inputs to improve the quality of schools.

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