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IMPROVING MATHEMATICS LEARNING OUTCOMES IN SIMPLE FRACTION MATERIALS THROUGH CONCRETE OBJECTS

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ABSTRACT

The background of this study is because the learning process that has not been maximized and student learning achievement about simple fractions is still relatively low. The purpose of this study is to determine the extent to which the use of props of concrete objects can improve the learning outcomes of third grade elementary school students on simple fraction subjects. The method in this study, using Classroom Action Research. Classroom Action Research conducted in 2 cycles, each cycle has 4 stages. Data collection techniques used were observation, questionnaire, test, and attitude scale. The subjects in this study were 30 class III students at Mutiara Hati Elementary School, Central Antapani District, Bandung city. Based on the results of the study, the researchers concluded that the use of props of concrete objects in simple fraction material can improve student learning outcomes and activeness as well as students' response to learning is quite positive.
Keywords: Learning Outcomes, Simple Fractions, Concrete Objects

INTRODUCTION

Mathematics is the study of magnitude, structure, building space, and changes in a number. Mathematics comes from Greek, namely mathematikos which means exact science. In the Dutch language of mathematics it is called wiskunde which means the science of learning. Mathematics is very much needed in learning in elementary school because mathematics is needed in this life. Various problems of life can be sustained by using mathematics. During this time, many people who considered mathematics were only concerned with numbers and various types of formulas and were rigid. Whereas, in fact it is not so in addition to dealing with numbers and formulas that are explicit, it turns out mathematics is more than just that, there are many implied meanings contained in it.

Props are a tool that can be absorbed by the eyes and ears with the aim of helping teachers so that the learning and teaching process of students is more effective and efficient. Teaching aids in teaching hold an important role as a tool to create an effective learning process. The advantage of teaching aids is to foster students' interest in learning because the lessons become more interesting and easy to understand, while the lack of teaching aids that are teaching using teaching aids is more demanding for the teacher and a lot of time is needed and preparation. Thus, the

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success of the learning process is the main thing coveted in the implementation of education in schools.

In this globalization era, the application of science and technology must be supported by high-quality human resources. In learning mathematics, especially in the low class, there are many things or factors that influence student learning success and things that often hinder the achievement of learning goals. Because basically, every child is not the same way of learning, so also in understanding abstract concepts. Through a different level of learning from one another, good teachers are teachers who are able to teach well, especially when instilling new concepts. One learning method that is expected to be able to provide problem solving assistance in improving student learning outcomes is to implement learning systems that use props of concrete objects, especially in the field of mathematical studies. Media plays a role as a stimulus for learning and can foster learning motivation so students do not become bored in achieving learning goals.

The application of learning methods using props of concrete objects, especially in the field of mathematical studies is based on the fact that in the field of mathematical studies there are many subjects that need tools to describe them, including the fraction concept material. Therefore, learning using visual aids in the subject matter is considered very appropriate to help facilitate students in understanding the material. On the other hand, the atmosphere of learning will be more alive, and communication between teachers and students can be well established. This can help students improve their learning achievements in the field of mathematics.

Teachers tend to use conventional methods, namely to provide rules directly to memorize, remember, and apply. The statement above is also supported by observations that have been carried out at Mutiara Hati Elementary School, Central Antapani District, Bandung City. Test questions were given to class III students before just learning the concept of simple explanation. Based on preliminary observations basically, students still do not understand the meaning of fractions as a part of the whole.

Many third grade students at Mutiara Hati elementarys school cannot answer correctly when given illustrated rupture questions, students can express fraction values because one part of the area is shaded. This means that students still do not understand the concept of rupture correctly. The lack of understanding of the concept of fractions is one of the main causes of the

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inability of students to answer questions correctly. When students are faced with questions that are not usually exemplified by the teacher, students still find it difficult to use the knowledge they have. To overcome students' learning difficulties about the concept of simple fractions, it is necessary to have a learning planning process using props of concrete objects.

Basically, students learn through concrete objects. To understand mathematical concepts that are abstract in nature students need concrete objects as intermediaries or media for these objects usually referred to as props. The use of teaching aids not only shapes students' concepts but can also be used for understanding concepts, exercises and reinforcement, will help students to understand the concept of simple fractions.

For this reason, learning mathematics using these teaching aids is chosen because it facilitates students' understanding of abstract fraction concepts that will be concrete. Besides that, by using teaching aids the motivation of students to take part in the activities of the teaching and learning process is getting higher and in the end the mathematics learning outcomes also increase.

To achieve these objectives, it is necessary to make various efforts to improve education, especially in terms of learning. The objectives of mathematics learning in elementary schools are as follows:

1. Understand mathematical concepts, explain the interrelationships between concepts, and apply concepts or algorithms.
2. Using reasoning on patterns and traits, performing mathematical manipulations in generalizations, compiling evidence or explaining mathematical ideas and statements.
3. Solve problems that include the ability to understand problems, design mathematical models, complete models, and interpret solutions obtained.
4. Communicate ideas with symbols, tables, diagrams, or other media to explain the situation or problem.
5. Have an attitude of respect for the use of mathematics in everyday life.

In order for the goals of mathematics learning above to be fulfilled, a teacher should be able to create conditions and learning situations that enable students to actively shape, discover, and develop their knowledge. As Killen put it (Anitah, 2008: 123), there are two main approaches in learning, namely approaches that are centered on teacher activities (teacher centered) and approaches centered on student activities.

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Based on observations made in class III Mutiara Hati Islamic School, it turns out that students do not understand the concept of fractions. From the observations that have been made, it shows that 36.7% (8 students) are active in learning activities from all 30 students. Students 'understanding of the concept of fractions is still low, their average score below the minimum completeness criteria (KKM) set by the school is 65. The students' low understanding, of course there are many factors that cause it, for example the problem of applying teacher-centered learning methods (teacher center) while students tend to be passive. Another factor is the application of conventional learning models. This teaching system causes students not to actively participate in learning.

Based on the description above, researchers are interested in conducting research with the title "Improving Mathematics Learning Outcomes in Simple Fraction Materials through Concrete Objects".

Learning

Learning is an activity carried out consciously and intentionally. The learning objective according to Sugandi (2000: 25) is to help students in obtaining various experiences and experiences with the intended behavior include knowledge, skills, and values or norms that function as a controller of student attitudes and behavior.

a. Characteristics of Learning

The characteristics of learning in his book Sugandi (2000: 25) are as follows:

Learning is carried out consciously and planned systematically.

1) Learning can foster students' attention and motivation in learning.
2) Learning can provide interesting and challenging learning material for students.
3) Learning can use appropriate and interesting learning aids.
4) Learning can create a safe and enjoyable learning environment for students.
5) Learning can make students ready to accept lessons both physically and psychologically.

b. Learning Principles

The principles of learning in his book Sugandi (2000: 27) are as follows:

1) Learning Readiness
2) Attention
3) Motivation

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4) Student Activity
5) Experiencing Alone
6) Repetition
7) Subject material that is challenging
8) Revert and Strengthen
9) Individual Differences

c. Factors in choosing the learning method

1) Objectives to be achieved.
2) Students.
3) Learning Materials.
4) Facilities available.
5) Teacher.
6) Goodness and weaknesses of certain methods.

Mathematics

In the opinion of the 2004 curriculum, mathematics is a study material that has abstract objects and is built through a deductive reasoning process, namely the truth of a concept obtained as a logical consequence of previously accepted truths so that the linkages between concepts in mathematics are very strong and clear. Whereas in the opinion of the 2006 Curriculum, mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and advances human thinking power.

Props

Props are part of learning media that can be interpreted as all objects used as intermediaries in the learning process. The basic purpose of using learning media is to clarify the instruments to be delivered, can stimulate attention, though, and ability of students, teaching aids must also be able to improve the effectiveness and fluency in the learning process, especially in terms of clarifying the material being studied, so that it can eventually accelerate the process of changing student behavior. While the notion of mathematics teaching aids is a tool of mathematical calculations with various forms of calculations ranging from addition, calculation, multiplication,

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division, etc. There are many more forms of mathematical calculations. Like math calculations with various mathematical formulas.

a. The function of the Props

1) Provide motivation to students
2) Introducing, improving, and increasing understanding of concepts and facts
3) Simplify abstraction
4) Provide variations in teaching so students are not too bored with theory
5) Time efficiency in teaching and learning because students understand more easily
6) Develop a discussion topicPromote mathematics outside the classroom to be able to show the application of mathematics in the real situation.

b. Terms of Making Props

1) The shape is simple and more durable (not quickly damaged)
2) If there is a better use of items that are cheap and easy to obtain
3) Easy to store and use
4) Streamlining in teaching and simplifying the process of understanding not the other way around
5) Must be adjusted to the age of the child
6) If it is possible to be used on several topics, it is better
7) Shape and color can attract students' attention.

c. Types of Teaching Aids

1) Picture
2) Map
3) Whiteboard
4) Sandbox

The props used in this study are using image props because they are liked by children of various ages, obtained in a ready-to-use condition, and do not take up preparation time other than that to attract students' attention in doing so which will be tested in grade III SD Islam Mutiara Hati Academic Year 2017/2018.

d. Purpose of Props

1) Introducing, forming, enriching, and clarifying.

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2) Develop the desired attitude.
3) Encourage further student activities.

e. Advantages of Using Props
1) Growing interest in student learning because the lessons become more interesting.
2) Clarify the meaning of lesson material so that students understand it more easily.
3) Teaching methods will be more varied so students will not be easily bored.
4) Make more active activities in learning such as: observing, doing and demonstrating and so on.

f. Disadvantages of props
1) Teaching using teaching aids requires more teachers.
2) A lot of time is needed for preparation.
3) Material willingness to sacrifice is necessary.

Fraction Number

Fractions are one way to write numbers. Fractions show that if a number is part of one whole number (Long, 2003: 1). Count numbers are held to describe one of the properties of the set. The number of members in each set is a number. Fractions are held to describe one or several parts of an object. In other words fractions are numbers expressed $\frac{a}{b}$ with a whole number, b integers, b ≠ 0, and b are not factors of the numerator.

Example:

If an object is divided into two equal parts, then each part is one of the same two parts. It is called "all things" or "whole". Each part is called "half of all objects" or shorter "half whole" or "half". The symbol "$\frac{1}{2}$" is used to indicate a part obtained by the method above. The following is a picture of the object symbolizing "$\frac{1}{2}$"

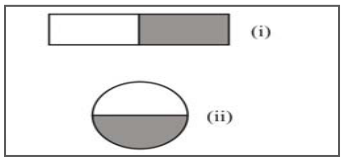

Figure 1. Declaring object "$\frac{1}{2}$"

Fractions describe one or more parts of the object that are considered whole. A roundabout can be divided into two equal parts by folding it through the center of the

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roundabout. The roundabout is called the "whole" thing. Each part that occurs is called "half.

Fractions have several types. The following types of fractions:

a. Ordinary Fractions

Ordinary fractions are fractions with a numerator and the denominator is an integer, for example: 1/4, 2/5, 9/10.

b. Pure Fractions

A pure fraction is a fraction whose numerator and denominator are integers and the numerator applies less or less than the denominator. Pure fractions can be said as ordinary fractions but ordinary fractions may not necessarily be said to be pure fractions, for example: 1/6, 3/5, 7/15.

c. Mixed fractions

Mixed fractions are fractions consisting of integer parts and pure fractional parts, for example: 3 1/4, 5 2/5, 1 9/10.

d. Decimal fractions

Decimal fractions are fractions with denominators 10, 100, 1000, and so on, and are written in commas, for example: 0.4; 4.6; 9.2.

e. Percent or percent

Percent or percent is a fraction with the denominator 100 and denoted by%, for example: 4% means 4/100.

f. Permil or thousand

Permil or per thousand is a fraction with a denominator of 1,000 and denoted by% 0, for example: 8% 0 means 8/1000.

METHOD

The method in this study is classroom action research. The subjects of this study were all third grade students of Central Antapani Islamic Elementary School in Bandung City consisting of 18 male students and 12 female students. The reason for choosing this class of students to be used as research subjects is because according to observations made so far it turns out that most students in this class have low levels of learning achievement. This is also seen in the average value received by students in mathematics subjects on the subject of fractions that have not yet

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reached the KKM standard, the data obtained from the test before the implementation of classroom action research with learning strategies of concrete objects.

This classroom action research begins with the first cycle, by carrying out the initial test after being given the subject matter. After the results of the initial test are known and examined after it is known the students' difficulties in understanding the concept of fractions. This class action research will reveal the problems that occur in mathematics subject learning in the subject of fractions by using props of concrete objects. The researcher is in the school from the beginning to the end of the study to find out the state of the student, formulate the next action, monitor, and report the results of the study.

The procedure of this study consists of cycles I and II. For smooth research, procedures are needed in research that relates to the problems to be studied, namely in the form of research preparation. The research procedure is the steps used to obtain data from the sources studied starting from the beginning to the end to be presented in the form of research. The course of research carried out until the preparation is through the following stages.

a. Preparation Stages
b. Implementation Stages

Cycle I

At this stage, the material that the researcher prepares is material with the subject of introducing fractions by using the aid of concrete objects.

a. Planning
    1. Problem identification and problem formulation.
    2. Preparing Learning Plans (RP).
    3. Designing learning with flat building visual sheets that are easy to make to introduce fractions.
    4. Design a formative test.
b. Action

The first cycle of action was carried out in two meetings.

1. Observation
2. Reflection and Analysis

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Cycle II

Given the results of the tests in the first cycle there are still shortcomings and errors, the researchers held a repetition of the action in the second cycle so that the research objectives can be achieved.

a. Planning

b. Actions

The implementation of the action in the second cycle was also carried out twice meeting.

c. Observations

d. Reflection and Analysis

RESULTS AND DISCUSSION

Results

To find out the results of achieving an improved understanding of students' concepts, researchers conducted an assessment based on several aspects in accordance with indicators of understanding concepts. Every action in the cycle using the application of props of concrete objects has shown the following.

From the results of observations, researchers found various problems and signs of students' understanding of the concept, especially in fraction learning concepts in class III SD Mutiara Mutiara Elementary School. In connection with this, the researcher seeks to improve the understanding of students' concepts in learning mathematics by conducting research in class III SD Mutiara Mutiara which uses the application of mathematical props to concrete objects in simple fraction concept material. It aims to help students in the learning process in the classroom whose implications are expected to improve students' conceptual understanding.

The first cycle of research was conducted in April in Class III SD Mutiara Mutiara Elementary School, with a Learning Implementation Plan (RPP) that had been prepared using the application of mathematical props to concrete objects. The time used is three meetings with an allocation of 2 x 35 minutes for each meeting. The implementation of the second cycle was held in May in three meetings with an allocation of 2 x 35 minutes for each meeting.

Students while participating in learning related to the achievement of the results of understanding student concepts can be seen from the results of observations or observations

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made by observers and researchers. Student learning outcomes while participating in learning can be presented in the table as follows:

Table 1. Comparison of Student Learning Completion Pre Cycle, Student Cycle I, Cycle Siklus

Observation Aspect	Pra Siklus		Siklus I		Siklus II	
	Total students	Percentage	Total students	Percentage	Total students	Percentage
Completeness in learning	11	36,7 %	23	76,7 %	27	90%

The results of observations or observations presented in Table 1 above can be described that the achievement of student learning outcomes increases and thus understanding students' concepts while following learning increases as well.

A real picture of increasing student learning outcomes in the first cycle and second cycle can be presented in the following graph:

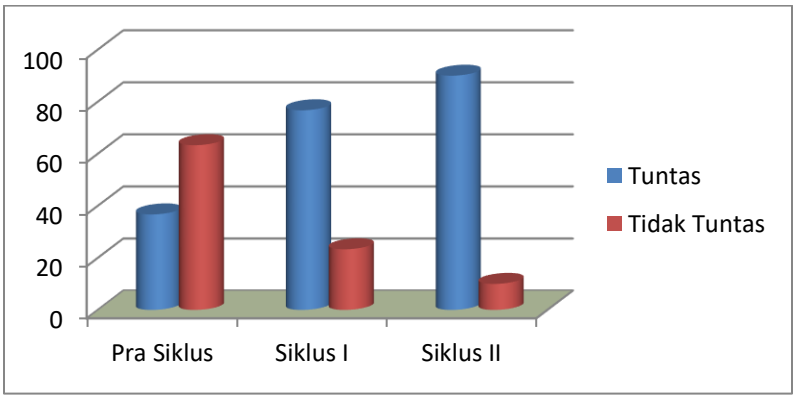

Figure 2. Comparison of Student Learning Completeness Pre Cycle, Cycle I, Cycle II

Besides being seen from the learning outcomes, the students' understanding of the concept of improvement can be seen based on the increase in student observation results which include student learning activities in attending the lesson.

The results of classroom action research conducted in two cycles have increased from cycle I to cycle II, and have been able to reach the complete limit according to the performance indicators set out in the material. Thus, classroom action research carried out is in accordance with the

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expected goals, namely by using the application of mathematical props of concrete objects can improve students' understanding of concepts in learning Simple fraction concepts.

CONCLUSIONS

Based on the results of research and discussion on the application of props of concrete objects in learning mathematics in elementary schools, conclusions can be drawn as follows:

1. There is an increase in student learning outcomes for simple mathematics subject matter using visual aids.
2. The activities of teachers and students in mathematics learning with the application of teaching aids concrete objects showed a fairly good improvement. This is evident from the results of observations made by researchers during the learning process where students are so active in participating in learning, both during discussions and while working on assignments given by the teacher.
3. Students' responses to the application of mathematics teaching aids to concrete objects are quite positive. With the spread of questionnaires filled out by students to find out students' interest in simple fraction learning shows that students are happy with mathematics learning by using the application of concrete objects.

REFERENCES

Anitah. (2008). *Strategi Pembelajaran di SD*. Jakarta: Universitas Terbuka.

Long, L. (2003). *Fabulous Fractions.* Canada: John Wiley & Sons,Inc.

Sugandi. (2000). *Teori Pembelajaran*. Bandung : PT. Remaja Rosdakarya.