

THE EFFECT OF USING CYCLE FRACTION ON THE SUMMARY OF SIMPLE FRACTIONS IN CLASS IV STUDENTS OF SDN 02 TILAMUTA

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ABSTRACT

This study aims to determine the effect of the use of cycle fractions on the addition of simple fractions in fourth grade students at SDN 02 Tilamuta. This type of quantitative research is descriptive. One group pretest-posttest research design. This study uses data collection techniques through tests and documentation. The sample of this research is the fourth grade students as many as 22 people.

The results showed that the effect of the use of the circular board teaching aid had a significant effect on Mathematics Learning Outcomes. This result can be seen from the average pretest score in learning is 46.81 and after learning the posttest average value becomes 78.63. This is reinforced by the results of hypothesis testing with posttest t-test at level $\alpha = 0.05$, obtained t count 11.701 with t table is 2.30 or (t count 11.701 t table 2.05). Thus, it is concluded that there is an effect of using the cycle fraction on the addition of fractions in class IV SDN 02 Tilamuta, Boalemo Regency.

Keywords: Circle board, Addition of Fractions

INTRODUCTION

Basically mathematics is a structured and well-organized science. Therefore, in mathematics teaching materials there are elements of order, regularity, and the relationship between one material and the next teaching material. Thus, to learn mathematics requires a strong basic knowledge in understanding the concept of the next teaching material. This shows that mathematics education at the basic knowledge level plays an important role as the basis for mastering mathematics material at the next level of educators, therefore if the basic mathematical ability is not strong, it will affect the next level. With the importance of learning mathematics in elementary school, on the other hand, many elementary school students do not like to learn mathematics where mathematics is considered a difficult subject to learn, boring, and even scary. This is because mathematics only uses symbols that are dense in meaning and have a very broad understanding.

The learning conditions described above are a challenge for mathematics teaching teachers in elementary schools. As a professional elementary school teacher, he should be responsible for the learning outcomes of his students, therefore elementary school teachers must master the right learning methods. This can cause difficulties for students in understanding the learning material, so that it will then cause boredom for students in participating in learning activities. In order for mathematics to be liked and interested by elementary school age students, various methods of delivery are needed, both methods and tools or visual media. This is because elementary school age students are in the stage of concrete thinking. In accordance with the developments put forward by Piaget, the age of 7 to 12 years is included in the concrete operation phase, where the child's ability to think logically has developed on the condition that the object that is the source of logical thinking is present concretely, so in teaching mathematics, efforts should be made to use which abstract can be concretized. In this case, teachers are required to know, choose and be able to apply what is considered effective so as to create a conducive learning atmosphere and provide opportunities for students to practice working on the problems they face. One of them is by using Cycle Fraction on fractional material.

DEFINITION OF FRACTION

What is meant by a fraction in mathematics is a rational number that can be written in the form a/b (read a per b), in the form where a and b are integers, b is not equal to zero, and the number a is not a multiple of b. In simple terms, a fraction is a number that has a numerator and a denominator. To explain the meaning of fractions as part of something intact, you can use illustration images, where the part in question is the part that is considered (marked with shading). The shaded part is called the numerator and the intact part is considered a unit and is called the denominator.

Types of Fractions

There are several types of fractional numbers (Sundayan, 2013: 46), namely:

Common Fraction

An ordinary fraction is a fraction that has only a numerator and denominator.

Example:

$1/3, 2/3, 4/10$

Fractional Percent

A percent fraction is a number that is divided by one hundred.

Example:

20% is read as 20 percent and the value is equal to 20 per 100 = 0.2

45% is read as 45 percent and the value is equal to 45 per 100 = 0.45

Permil Fraction

A permil fraction is a number that is divided by a thousand.

Example:

10‰ is read as 10 per mil and the value is equal to 10 per 1000 = 0.01

70‰ is read as 70 per mil and the value is equal to 70 per 1000 = 0.07

Fraction Worth

Fractions are said to have the same value if the comparison and denominator can be multiplied or divided by the same number.

$$a/b = (a \times m) / (b \times m)$$

Example:

$$1/3 = (1 \times 2) / (3 \times 2) = 2/6$$

Simple fraction

A simple fraction is the smallest form of a fraction that is when the GCF of the numerator and denominator = 1. There are many ways to simplify a fraction, the most effective way is to divide by the GCF between the denominator and the numerator. However, using the FPB requires a longer counting process for certain questions that use large numbers.

Example:

Simple form of $28/42$

Simple form of $45/72$

Simple form of $11/1$

OPERATION COUNT ADDITION OF FRACTIONS

In fractions there are several fractional arithmetic operations, namely addition, subtraction, multiplication, and division operations. Furthermore, in the addition of fractions, arithmetic operations are divided into two types, namely the addition of fractions with the same denominator and addition of fractions with different denominators.

1. Simplify Using FPB

The first way to simplify fractions is to use the FPB application. By using the FPB application, you will find the answer easy and fast, and the form of the result will also automatically be simple. To use this FPB application, make sure the fraction you are working with is an ordinary fraction, where the fraction has a smaller numerator than the denominator.

Sample Discussion

Simplify the following fraction 28/42

Solution:

GCF is the greatest common factor, so each is calculated

The factors are as below:

- Factor of the number 28 = (1, 2, 4, 7, 14, and 28)
- Factors of the number 42 = (1, 2, 3, 6, 7, 14, 21, and 42)

So, the GCF of the numbers 28 and 42 is = 14. So we get

$$\frac{28:14}{42:14} = \frac{2}{3}$$

1. Simplify with the Divide Method

The next way to simplify the form of fractions is to divide them continuously, by using this method you already have a backup alternative that you can do in solving problems related to fractions. This technique can be done when dividing fractions with the same number (dividing) continuously so that the end result is a number that cannot be divided again by any other number, except the number one.

Sample Discussion

Simplify the following fraction 60/75

Solution:

First division process (Numbers 60 and 75 divided by 5)

$$\frac{60:5}{75:5} = \frac{12}{15}$$

Proses pembagian kedua (Bilangan 12 dan 15 dibagi 3)

Jadi, $\frac{12:3}{15:3} = \frac{4}{5}$ bentuk sederhana dari 60/75 adalah 4/5.

1. Simplify Mixed Fractions

The next way is to simplify mixed fractions, the solution is almost the same as simplifying ordinary fractions. However, what distinguishes common fractions from mixed numbers is the placement of the integers. In mixed fractions, the integers and fractions are separated first.

Example discussion

Simplify the following fractions 3 60/72

Solution:

$$3 \frac{60}{72} = 3 + \frac{60}{72}$$

FPB 60 dan 72 adalah 12

$$\frac{60}{72} = \frac{60 : 12}{72 : 12} = \frac{5}{6}$$

Diperoleh:

$$3 \frac{60}{72} = 3 + \frac{5}{6} = 3 \frac{5}{6}$$

So, 3 $\frac{60}{72}$ adalah = 3 $\frac{5}{6}$

1. Simplify Unusual Fractions

An unusual fraction is a fraction whose denominator is equal to or less than the numerator (the denominator the numerator). To solve an unusual fraction you must first make changes to the fraction. You have to convert fractions into mixed numbers by dividing.

Sample Discussion

Simplify the following numbers

$$\begin{array}{r} 5 \\ 18 \sqrt{96} \\ \underline{90} \\ \text{siswa 6} \end{array}$$

96/18

Penyelesaian:

$$\text{Diperoleh } \frac{96}{18} = 5 \frac{6}{18}$$

so $96/18 = 5 \frac{6}{18}$

DEFINITION OF MEDIA CYCLE FRACTION

Along with the development of science and technology, the quality of education, especially mathematics learning needs to be improved. Efforts are continuously being made to improve the quality of mathematics learning by innovating, implementing better models, and learning strategies. Good learning is learner-centered learning, no longer teacher-centered. Learning that can be applied to increase student activity includes the fraction circle model

According to Trianto (2009:34) kaffah model is defined as an object or concept that is used to present a thing. Something real and converted to a more comprehensive form.

On the other hand, Cramer et al in Renny said that the Cycle Fraction model is a concrete model that can be used to study fractions, the concrete model can be used to help grow students' understanding of the parts and whole of fractions and the meaning of the relative sizes of fractions. This is in line with what was stated in The Rational Number Project (RNP) by Cramer and Henry that the Cycle Fraction model is a very effective representation for building mental images on fractional numbers.

Meanwhile, according to Kathleen Cramer, the Cycle Fraction model is, "We have found the Cycle Fraction model to be the most powerful concrete representation for fractions. The circle model helps build understanding of the part-whole model for fractions and the meaning of the relative size of fractions. Fraction circles are also a powerful model for fraction addition and subtraction".

The meaning above is that the Cycle Fraction model is the most powerful model for studying fractions, and can help build understanding of fractions and the meaning of the relative sizes of these fractions.

From some of the definitions above, it can be concluded that the Cycle Fraction model is a concrete model that can be used in studying fractions

DEFINITION OF MEDIA

According to Sundayana (2016: 6) media as a tool or the like that can be used as a messenger in a learning activity. The message in question is the subject matter, where the existence of the media is intended so that the message can be more easily understood and understood by students. This is in line with Zainal Aqib (2013: 50) which states that the media is an intermediary, an introduction. In learning media is everything that is used to channel messages and stimulate the learning process in students.

According to Gagne, media are various types of components in the environment

students who can stimulate them to learn, while the National Education Association (NEA) states that media is a form of communication, both printed and audiovisual and its equipment (Arif S. Sadiman, et al, 2011: 6). Furthermore, Arif S. Sadiman, stated that the media is anything that can be used to channel messages from the sender to the recipient so that it can stimulate the thoughts, feelings, concerns and interests and concerns of students in such a way that the learning process occurs. According to Azar Arsyad (2002: 4-5) media is a component of learning resources or physical vehicles that contain instructional materials in the student environment that can stimulate students to learn.

Based on some of the opinions above, it can be concluded that Media is everything that a person can use to convey a message to the recipient of the message. In learning media is everything that is around students that can be used as a means to convey messages to students. delivery of messages in this case is learning material.

KINDS OF MATHEMATICS LEARNING MEDIA IN ELEMENTARY SCHOOL

There are various kinds of mathematics learning media that can be used in the classroom, especially for learning mathematics for elementary school students, including:

a. Children's toy media

Used to instill an understanding of numbers, sets, members of the set, the meaning of greater/smaller and equal, and so on.

b. Flannel board media

Used so that what is explained can be seen by many children and so as not to bother the teacher and students.

c. Colored rod media

Also known as cuisenaire rods (cuisenaire rods).

d. Geometric skeleton model

Can be a cube, a block, a regular rectangular pyramid, a quadrilateral

regular triangular prisms, etc.

e. Domino game media

Can be used to design Math games in order to improve basic math skills, for example to practice arithmetic operations.

f. Media Cycle Fraction

Serves as a tool in learning the concept of flat shape recognition, circumference recognition, area recognition, symmetry, coordinates and others on flat shapes. From the various learning media above, one of the authors used in this research is Media Cycle Fraction.

ADVANTAGES AND DISADVANTAGES OF CYCLE FRACTION

Advantages of Cycle Fraction

The advantages of Cycle Fraction are as follows:

1. The shape is simple so it is easy to manufacture.
2. More economical because the cost is cheap and can be used many times.
3. Materials and production tools are easy to obtain.
4. There is an element of play in its use because it can be used for various flat shapes with rubber band games

Disadvantages of Cycle Fraction

The disadvantages of Cycle Fraction are as follows:

1. Teaching by using more demanding teachers.
2. A lot of time is needed for preparation
3. Need a willingness to sacrifice materially

Cycle Fraction Steps

Steps of the Cycle Fraction Model There are various kinds of steps of the Cycle Fraction model that can be used by a researcher, as stated by Renny Sendra Wahyuni et al, namely:

1. Divide and cut the manipulative cake into equal parts.
2. Find equivalent fractions by exploring the Cycle Fraction model which they put on the black cardboard provided.
3. Adding fractions with different denominators.

Meanwhile, according to Rusfendi (2002:165) the steps are as follows:

1. Prepare paper in the form of a circle as props that state.
2. Insulate the paper into 2 equal parts.
3. Shade part of the circle to show the fraction.
4. Divide the demonstration into 3 equal parts in different directions.
5. Reducing which means removing the shading on 2 parts of the circle

USE OF MEDIA CYCLE FRACTION

Ruseffendi (2002: 162) describes the steps for using Cycle Fraction media as follows:

- a. The teacher communicates in advance the board used in learning to get flat.
- b. The teacher explains to the children the activities carried out and how to use Cycle Fraction using a rubber band.
- c. Children move forward to form geometric shapes in Cycle Fraction.
- d. The child is given an explanation then the teacher asks questions about objects around the child that have a flat shape.
- e. Teachers provide motivation and rewards to children.

The use of Cycle Fraction media according to Sundayana (2013:127), compiling working instructions from the Cycle Fraction media, among others are:

- a. The teacher puts this Cycle Fraction media in front of the class, it can be hung or propped up with other objects. The teacher also provides a number of rubber bands with different colors.
- b. The teacher demonstrates classically how to form a flat shape.
- c. Then each student is asked to form a flat shape according to their respective creativity.
- d. Students are asked to describe the results obtained on dotted or checkered paper.
- e. Through question and answer the teacher introduces the meaning of circumference.
- f. Students determine the perimeter of each flat figure that he previously obtained.
- g. Through question and answer, the teacher introduces the broad meaning of flat shapes.
- h. Students are asked to estimate the area of the flat shape that they have made, then the teacher introduces the names of the flat shapes that have been made by the students (square and rectangle).

Application of Cycle Fraction Media to Addition of Fractions Simple

The steps for using the Cycle Fraction are as follows:

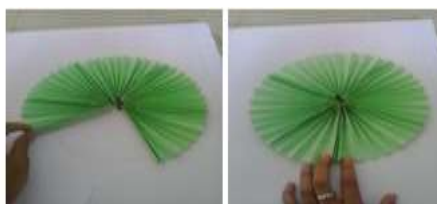
1. White cardboard temple on top of Styrofoam as the base, form a circle on the cardboard, then place the nail plate in the middle.



2. The colored paper is bent a lot and bent in half to form a fan, stick a stick at each end



3. Insert the hole in the circle into the mading needle



4. Pierce the wall plate around the circle with the same distance and make another circle in a different place as a result



5. Make a circle on plastic paper and make a hole in the center that has been outlined in size $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}$



Result



Next is how to use Cycle Fraction for fraction addition material.

Contoh : $\frac{1}{2} + \frac{1}{4} = \dots$

Paste the plastic circle that has been provided according to the number to be operated



Paste the plastic circle on the resulting circle according to one of the numbers whose denominator is the largest of the numbers to be operated on

Play with the same rotation according to $\frac{p}{q}$ yaitu $\frac{1}{2}$ in the result circle

Putar lagi searah jarum jam sebanyak bilangan $\frac{1}{4}$ (penjumlahan)



Didapatkan hasilnya:

$$\frac{3}{4}$$

Jadi:

$$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$

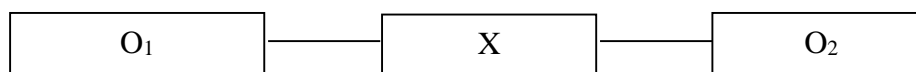
Didapatkan rumus:

$$\frac{p}{q} + \frac{m}{n} = \frac{np + qm}{qn}$$

RESEARCH METHODS

This research will be carried out at SDN 02 Tilamuta, Boalemo Regency.

The type of research used in this research is descriptive quantitative, the research design used is one group pre-test post-test (Sugiyono, 2012: 97), with the following design:



Where:

O1 = Pre-test

X = Cycle Fraction

O2 = Post-test

In this study there are two variables that will be tested for differences, these variables are Variable X is the Cycle Fraction learning media. And Variable Y is the result of learning the addition of fractions. In this study, the population was all fourth grade students at SDN 02 Tilamuta Kab. Boalemo. While the sample was selected using the Purposive Sampling technique. Purposive Sampling is a sampling technique with certain considerations, namely the consideration of choosing the best students in terms of providing information that is accurate enough to be selected as research respondents and the sample criteria obtained are really in accordance with the research to be carried out (Sugiyono, 2010:85). The researcher chose to use the Saturated Sample, assuming that the population is considered homogeneous because it is seen from the teacher, teaching materials, curriculum, and the time used in learning are all the same. The number of samples taken was 22 students of Class IV SDN 2 Tilamuta. Data collection techniques used include: Observation, Test and documentation. To test the instrument, it is done by testing the validity of the test and testing the reliability of the test. This test is based on the test score and then analyzed using the formula $Kr = 22$ as follows:

$$r_{11} = \left[\frac{k}{k-1} \right] \left[1 - \frac{\sum \delta_b^2}{\delta_b^2} \right]$$

(Arikunto, 2002: 171)

The data analysis technique was tested based on the post test results that had been collected, namely the values of the experimental class and the control class. The data normality test and hypothesis testing were carried out. To test the normality of the data using the Liliefors test (Sudjana, 2002: 466). Testing this data is expected to follow the normal distribution or distribution so that the proposed test can be continued. Hypothesis testing is done with the following test criteria.

a. Hypothesis modified pairs of statistical hypotheses

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 \neq \mu_2$$

Information :

H₀ : There is no effect of Cycle Fraction on learning outcomes of adding fractions to the ability of fourth graders at SDN 02 Tilamuta, Boalemo Regency.

H_a : There is an effect of Cycle Fraction on learning outcomes of fraction addition of fourth grade students at SDN 02 Tilamuta, Boalemo Regency.

a. Hypothesis testing using the t-test formula

Hypothesis testing using t-test aims to determine the difference in the average value of the pretest of the ability to add fractions before being subjected to the media and the posttest value of the ability to add fractions after being subjected to the media.

c. Testing Criteria

The hypothesis was tested with a significance level of = 5% or 0.05 and $db = n-1$, the following criteria were obtained:

If $T_{count} > T_{Table}$ then H_0 is rejected and H_a is accepted

b. If $T_{count} < T_{Table}$ then H_0 is accepted and H_a is rejected

RESEARCH RESULTS AND DISCUSSION

This research is an experimental study to determine the effect of Cycle Fraction on learning outcomes of fraction addition in Mathematics learning. The research design used in this research is a one group pretest-posttest design. The experiment was carried out in one group without a comparison group by giving a pretest and a posttest to the research subjects, and the sample in this study was class IV SDN 02 Tilamuta, Boalemo Regency, totaling 22 students. The things that are carried out to measure learning outcomes include instrument testing, data normality testing, and hypothesis testing.

This research was carried out with the aim of knowing the effect of the use of Cycle Fraction on learning outcomes of fraction addition in class IV SDN 02 Tilamuta. In this study, the number of samples taken was 22 students. This research is a quasi-experimental research, because this study aims to determine the cause and effect and how much the effect of the cause and effect by giving treatment (treatment). The procedure that the researchers carried out in this study was to provide teaching using Cycle Fraction to determine the effect on students' learning outcomes of adding fractions.

In the first meeting, the researchers explained the teaching materials related to the subject of adding fractions without using Cycle Fraction, then the researchers distributed a pre-test (Pre-Test) to determine student learning outcomes without using Cycle Fraction. At the second meeting the researchers explained the teaching materials related to the subject of adding fractions using Cycle Fraction, the researchers called students to answer the questions of adding fractions using Cycle Fraction in turns, then the researchers distributed worksheets to students. At the next meeting, the researcher explained the teaching material related to the subject of adding fractions using Cycle Fraction, then the researcher gave a final test (post-test) to find out the results of learning using Cycle Fraction. The results of the pre-test and post-test scores are what the researchers used as the basis for knowing the results of learning to add fractions without being given treatment, namely Cycle Fraction and given treatment, namely Cycle Fraction.

Based on the results of data analysis that has been carried out using tests, it is explained that there is an influence on the learning outcomes of fourth grade students at SDN 02 Tilamuta. Based on the results of research data analysis, it can be seen that the average student learning outcomes have not used Cycle Fraction (Pre-Test) which is 46.81, so this result is lower than the average value after using Cycle Fraction (Post-test) which is 78, 63.

Based on the results of the t-test analysis, the $t_{count} = 11.701$ and the t_{table} value at a significant level of 5% or $\alpha = 0.05$ and $d.f = n-1$ ($22-1 = 21$) using the 2-party test, the t_{table} value = 2.05. If t_{count} falls on the acceptance of H_a , then H_a which states the effect of Cycle Fraction on learning outcomes of fraction addition in fourth grade students of SDN 02 Tilamuta is accepted. Meanwhile, based on the calculation $t_{hitung} = 11,701$ it falls on the acceptance of H_a or the rejection of H_0 . So it can be concluded that there is an effect of using Cycle Fraction on the learning outcomes of adding fractions to the fourth grade students of SDN 02 Tilamuta. For more details can be seen in Figure 4.3 2-party hypothesis testing.

Based on previous research, the data obtained from the results of research conducted by Nur Aisyah from the University of Indonesia Education with the title "Use of Cycle Fraction in Learning Operations for Adding Fractions to Improve Student Learning Outcomes". The results of this study where in cycle II and cycle III students completed by obtaining a percentage of 75.8% and 87.9%, respectively.

Therefore, the implementation of the Cycle Fraction in accordance with the characteristics of the students can have a significant influence on the learning outcomes of adding fractions to the fourth grade students of SDN 02 Tilamuta.

CONCLUSION

Based on the results of the research and discussion conducted, it is concluded that there is an effect of using the cycle fraction on the addition of simple fractions to the fourth grade students of SDN 02 Tilamuta. These results can be seen from the average value of the pretest in learning is 46.81 and after learning the average value of the posttest becomes 78.63. This is reinforced by the results of hypothesis testing with posttest t-test at level $\alpha = 0.05$, obtained t count 11.701 with t table is 2.30 or ($t_{count} 11.701$ $t_{table} 2.05$).

Suggestion

Based on the conclusions and research results obtained, it is suggested that it is hoped that with the use of Cycle Fraction students can easily understand the material being taught. Teachers are expected to be able to use Cycle Fraction well and creatively in order to please students to learn. Schools are expected to facilitate facilities and infrastructure for learning process activities. Finally, it is hoped that the results of the study will become a reference for future researchers to be better.

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