

Understanding Of Fraction Material Through Media Puzzle in Elementary School Students in Malang

Ria Norfika Yuliandari*

* UIN Maulana Malik Ibrahim Malang
Fikachu_math@pgmi.uin-malang.ac.id

Dian Mustika Anggraini**

** IAIN Kudus
dianmutikaanggraini@iainkudus.ac.id

Kholidul Karimah ***

*** UIN Maulana Malik Ibrahim Malang
Rimakarimah552@gmail.com

Nurul Izhan Pepridel Yulanda ****

**** UIN Maulana Malik Ibrahim Malang
19140042@student.uin-malang.ac.id

Abstract

One of the math topics related to numbers is division. Equivalent fractions are groups of fractions that have the same value. This study aimed to find out how students understand equivalent fractions through puzzle learning media. This research and development is quantitative. Data collection tools are questionnaires and interview guides, and test result. The results showed that the pre-test before the product trial was applied with an average of 55, and the post-test after the puzzle product was used with an average of 83.5. These results indicate that students understand equivalent fraction material at different levels.

Keywords: *Fractions, Puzzle media, Elementary School*

Abstrak

One of the math topics related to numbers is division. Equivalent fractions are groups of fractions that have the same value. The purpose of this study was to find out how students understand equivalent fractions through puzzle media. This research is quantitative. Data collection tools are questionnaires and interview guides, and test results. The results showed that the results of the pre-test before the product trial was applied with an average of 55 and the results of the post-test after the puzzle product was applied with an average of 83.5. These results indicate that students understand equivalent fraction material at different levels.

Keywords: *Decent Fractions, Puzzle Media, Elementary School*

INTRODUCTION

Numbers, geometry, measurement, and data processing are the four mathematics disciplines that are taught to elementary school students. Numbers,

especially fractions, are one of the three materials that are considered difficult because they require a deeper understanding of conceptual understanding (Kesumawati, 2008) . Mastery of learning material by students shows the effectiveness of the learning process. One of the success criteria in the learning process is the teacher's ability to organize and carry out learning. The ability to succeed in learning is to utilize media to bridge the gap between abstract and more real mathematical ideas. Media can be seen as an introduction or intermediary (Sanaky, 2013) .

According to Sadiman, the media functions as a channel for messages to be delivered from the sender to the intended recipient. According to Gagne, the media consists of various components and their environment. Raharjo went on to say that the media is a container for messages that the source wants to send to the destination or recipient of the communication (Wafiyah, 2018) . The message received is an instructive message, and the goal achieved is the completion of the learning process (Sanaky, 2013) . According to Oemar Hamalik, instructional media are tools, methods, or techniques used to improve communication and interaction between instructors and students during the education and teaching process in schools (Hamalik, 2004) . Learning media is an intermediary used by educators or instructors to convey messages or information to students so that these students can be stimulated when involved in learning activities. Through the use of learning media, students will better understand abstract concepts because learning involves physical and mental activities as well as seeing and feeling activities which can make students explore the situations around them with feelings of happiness and joy. One of the content that requires media in the learning process is equivalent fractions (Wafiyah, 2018) .

The selection of equivalent fractional material in this study was based on the results of interviews conducted by the author with the class teacher. He said that there was a need for learning media on equivalent fractional operations to support learning activities so that students were able to understand more concrete concepts. In addition, it was found that the ability of students to understand fractional material was still lacking. This is evidenced by the average learning outcomes of students on fractional material worth still below the Minimum Completeness

Criteria (KKM). One of the influencing factors is the unavailability of learning media that supports the learning process.

In this study, the authors used puzzle learning media as a means of understanding the concept of equivalent fractions for students. The use of puzzles in this study is because it is in accordance with previous research conducted by Nisem. In this study it was found that the use of puzzle media was very effective in increasing student learning outcomes (Nisem, 2020) . In previous research conducted by Dame also showed that the use of puzzle media can improve the ability to compare two fractions for children with learning difficulties (Dame et al., 2014) . Not only that, Dewi Sri Muliani also conducted research on puzzle media on equivalent fraction material and stated that there had been an increase in learning resources (Mulyani et al., 2022) . In this study, it is different from previous studies in terms of research subjects and research locations. Even though the puzzle media is the same, the media application is different from previous studies. Because this puzzle media also uses a guidebook for using media and flashcards.

Based on the results of observations and interviews that the authors have conducted, the authors found facts in the field that in the learning process, the teacher uses learning media that is used in fractional material equivalent to only using a blackboard and sheets of plain paper. The use of learning media in its implementation does not yet have effectiveness and efficiency when teaching mathematics on equivalent fraction material. Therefore, the author uses puzzle media in understanding equivalent fraction material for elementary school students.

METHODS

This type of research is quantitative research with the aim of seeing a comparison of students' understanding before and after using the puzzle media on equivalent fraction material. According to Sugiyono, quantitative research is research that is required to use numbers starting from data collection, data interpretation, and the appearance of the results (Sugiyono, 2008) .

This study used the One Group Pretest-Posttest Design. The experimental subjects in this study were fourth grade students, totaling 40 students at MI Al-

Qur'an Singosari. The sample used in this research is Saturated Sampling. Design by giving an initial test (pre-test) before giving treatment and after getting treatment then given a final test (post-test).

RESULTS AND DISCUSSION

a. Worth Fractions

Fractions are one area of mathematics that deals with numbers. Fractions are difficult concepts to understand, but they are necessary for elementary students to master (Mamede, 2010; Streefland, 1991) . Equivalent fractions are the basic concepts of fractions that students must master (Ford, 1938; Hannula et al., 2004; Hart, 1981; Streefland, 1991) . According to Petit, Laird, & Marsden, understanding equivalent fractions is necessary for students to be able to add, subtract, compare, and sort fractions (Petit et al., 2010) .

Models or manipulatives may be preferred for learning fractional values (Petit et al., 2010) . This is consistent with Van de Walle, who stated that the best way to help children understand fractions is to have them use models to find different fractions (Van de Walle et al., 2014) . Students are challenged to look at the resulting fractions using models and manipulatives to identify standard algorithms for calculating equivalent fraction values after they can find different fractions (Ramury et al., 2015) .

Fractions linguistically come from the word *fractio* (Latin) which means to break into smaller parts (Edo et al., 2022) . Thus, it can be understood that fractions are obtained from a unified whole which is then divided into several parts. Fractions are illustrated in the form a/b with a as the numerator and b as the denominator. A number is called a fraction if a and b are integers and $b \neq 0$ (Vioreza, 2018) .

There are five perspectives on fractures, including: 1) part of the whole (fracture); 2) Size (Measure); 3) Division (Division); 4) Operations; and 5) Ratio/comparison (Nurani et al., 2021) . According to Kieren in Sari, Juniati, Patahudin, the concept of fractions as part of a whole is the most basic thing in understanding fractions and prior to knowing the interpretation of further fractions (Sari et al., 2012) . Fractions as part of this whole have a quantifier and denominator. The quantifier indicates the number or number of fair (equal; congruent) parts that

are observed or calculated. While the Denominator denotes equal parts of one whole.

As for the fraction material, there is something called equivalent fractions. Fractional numbers that have the same value can be called equivalent fractions (Kusmanto, 2012) . Meanwhile, Nurani explained how fractions are seen as fractions with the same number but various forms (Nurani et al., 2021) .

b. Media Puzzles

The product used by the authors in this study is learning media in the form of *puzzles* in mathematics subject matter of equivalent fractions intended for fourth grade students. This *puzzle* learning media is in the form of a board and is equipped with a guidebook which contains instructions for using the *puzzle media* , material and practice questions, and is equipped with flashcard Which there is two side. On side First is appearance fruit as a symbol and the second side is question.



Figure 1 Worth Fractions *Puzzle* Media

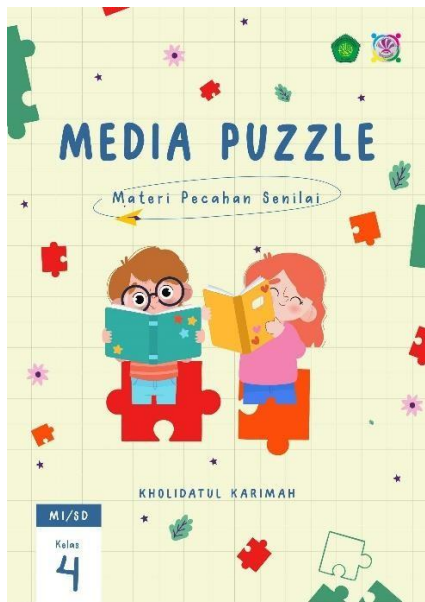


Figure 2 Front Cover Page of the Media Usage Manual

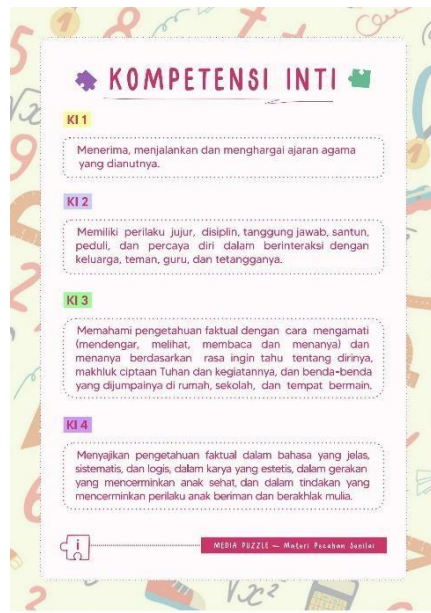


Figure 3 Core Competencies



Figure 4 Basic Competencies and Indicators



Figure 5 Limits of Puzzle Media



Figure 6 Media Puzzle Design



Figure 7 How to Use Puzzle Media

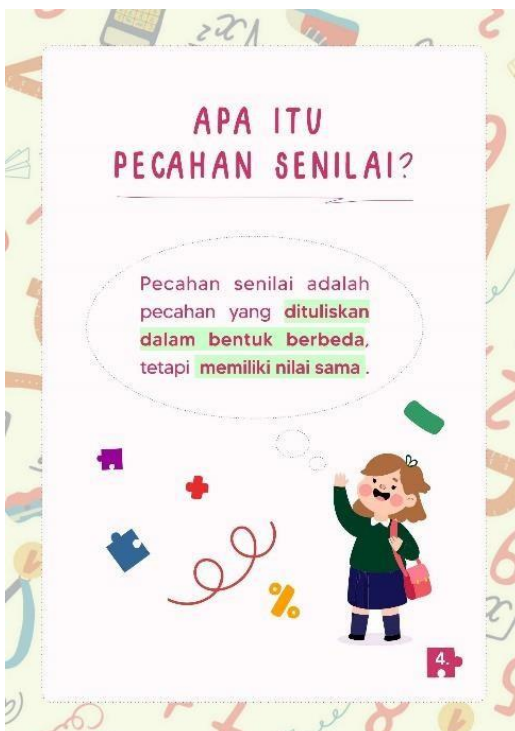


Figure 8 Definition of Decent Fractions

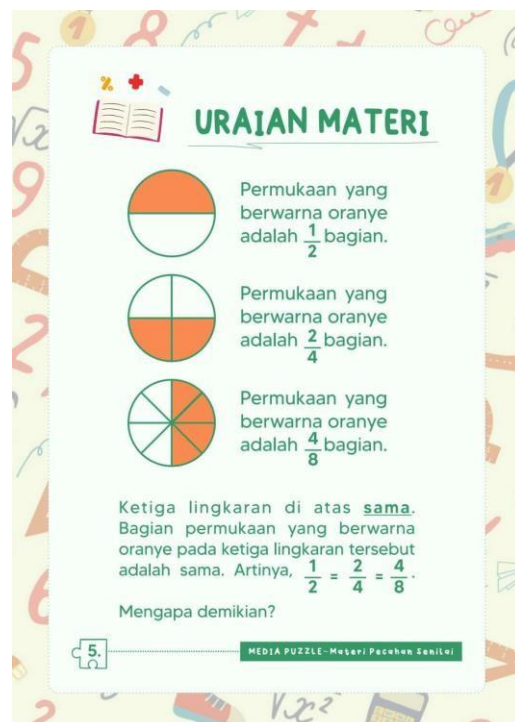


Figure 9 Material Description



Figure 10 Example Problem

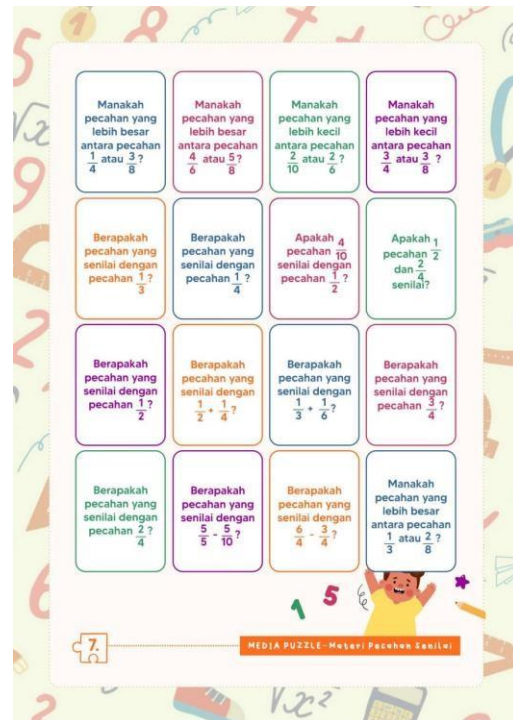


Figure 11 Post-test questions

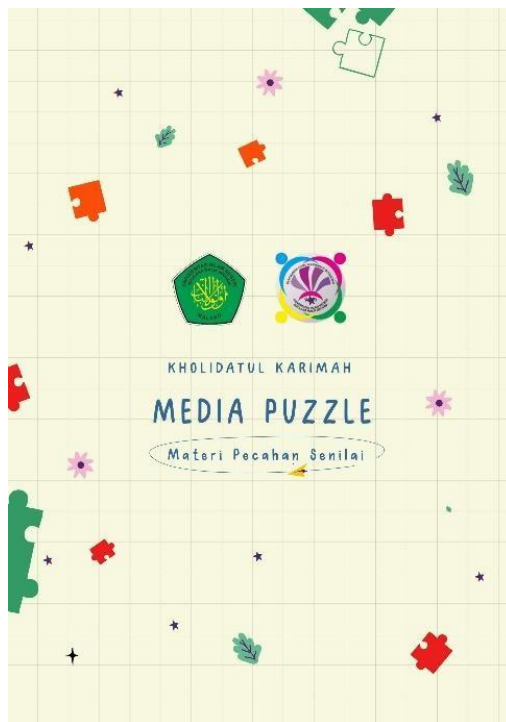


Figure 12 Back Cover Pages



Figure 13 Front View of Flashcard

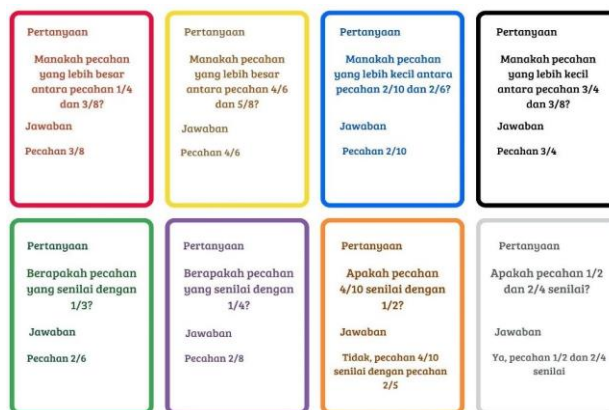


Figure 14 Back View of Flashcards for Teachers

c. Understanding of Fraction Material through Media Puzzle in Elementary School Students in Malang

The use of puzzle learning media for students is complemented by pre-test and post-test activities. This is intended to determine the level of students' understanding of equivalent fraction material. Pre-test value, the author gives a test in the form of a True-False statement to students. After doing the pre-test, the writer also carried out post-test activities to students, and the statements or questions given to students were the same questions when doing the pre-test. This is intended

to determine students' understanding of equivalent fraction material. This is in accordance with the criteria for selecting educational media, which are in accordance with the goals that have been set to be achieved, with the intention of supporting content lessons that are factual, conceptual, principled or generalized, as well as practical, adaptable, and lasting (Siswanto & Satriawan, 2021) .

The following is an explanation of the questions about the pre-test and post-test conducted on fourth grade students.

- 1) The first statement is "Equivalent fractions are fractions that are written in the same form but have different values". This statement is a FALSE statement.
- 2) The second statement is "Fraction 1 is equal to fraction 2. The $\frac{2}{4}$ statement is a TRUE statement.
- 3) The third statement is "The fraction $\frac{2}{4}$ is not equal to the fraction $\frac{4}{8}$ ". This statement is a FALSE statement.
- 4) The fourth statement is "Equivalent fractions are fractions that are written in different forms but have the same value". This statement is a TRUE statement.
- 5) The fifth statement is "The fraction $\frac{1}{2}$ is not equal to the fraction $\frac{2}{4}$ ". This statement is a FALSE statement.

Based on the data from the pre-test and post-test results in the table attached on the previous page, it shows that the ability of students' understanding of equivalent fraction material in mathematics has increased. This is evidenced by the results of the pre-test carried out before the product trials were applied with an average of 55 and after the application of learning media in the form of puzzle products the average student post-test result was 83.5. This is in accordance with previous research conducted by Nisem, 2018, in this study it was found that the use of puzzle media was very effective in increasing student learning outcomes (Nisem, 2020).

CONCLUSION

Fractions are one area of mathematics that deals with numbers. Fractions are a difficult concept to understand, but still necessary for elementary school students. Understanding equivalent fractions is necessary for students to be able to add, subtract, compare, and sort fractions. The best way to help children understand fractions is to have them use a model to find the different fractions. Fractions are obtained from a unified whole which is then divided into several parts. Fractions as part of this whole have a quantifier and denominator. The quantifier indicates the number or number of fair (equal; congruent) parts that are observed or calculated. While the Denominator denotes equal parts of one whole. Fractions that have the same value can be called equivalent fractions.

Puzzle learning media is in the form of a board and is equipped with a guidebook which contains instructions for using the *puzzle media*, material and practice questions, and is equipped with flashcard Which there is two side. On side first is appearance fruit as a symbol and the second side is question.

The use of puzzle learning media for students is complemented by pre-test and post-test activities. The results show that the ability of students' understanding of equivalent fraction material in mathematics has increased. This is evidenced by the results of the pre-test carried out before the product trials were applied with an average of 55 and after the application of learning media in the form of puzzle products the average student post-test result was 83.5.

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