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Implementation of Pirates Vs Echinomonster Algebra Props to Improve Math Learning Outcomes

[1]Deby Fariyanti , [2]Lutfiyah, [3]Nur Hidayatin
Department of Mathematics Education, Faculty of Teacher Training and Education,
University PGRI Argopuro University of Jember, Indonesia
Email: azkalutfimh@gmail.com

Abstract*: This research attempts to determine student learning results through the utilization of mathematical concepts and pirates vs. echinomonster props. This study is a qualitative, descriptive research project. The subject of this lesson is algebra. The study's subjects were five female students from SMP Al Kholili Kalisat Jember's class VII for the 2023–2024 academic year. The procedures of tests and interviews are employed in this research to collect data. Strategies for data analysis in this study are based on looking at how students tackle algebraic problems. The results showed that kids could solve algebraic problems with pirates vs. echinomonster props. The employment of pirates vs. echinomonster algebra props has been shown to improve students' mathematical learning outcomes by 1.2%, according to the study's findings.*
Keywords*: props, algebra, learning outcomes*

INTRODUCTION

According to Law 20, 2003, education is an intentional and planned attempt to establish a learning environment and process that enable students to actively develop their potential to achieve the qualities of intelligence, self-control, noble character, religious and spiritual strength, personality, and skills needed by themselves, society, the nation, and the state. There are two categories of education: formal and non-formal. Elementary, junior high, and high school are the educational levels offered by formal education, which is organized learning. On the other hand, non-formal education refers to a structured degree of instruction that takes place outside of official education and includes settings like training centers and courses. Education is closely related to the teaching and learning process. Learning and teaching are work processes that cannot be separated from each other. The teaching and learning process, according to Ratnasari (2019), is an interaction between students and teachers with the purpose of gaining knowledge. Mathematics is one of the most common sciences. From elementary school to college, mathematics is a subject that is taught at all educational levels.From elementary school to college, mathematics is a subject that is taught at all educational levels. According to (Pratiwi & Bernard, 2021), Mathematics has a role in helping humans solve problems in everyday life, for example, converting length measurements, calculating the amount of grocery prices, and so on. This shows that mathematics plays a significant role. However, most students do not like this subject because it is problematic. This indicator can be seen in the results of students' mathematics learning, which is still unsatisfactory.

Based on the observations of researchers at the AL Kholili Kalisat Junior High School institution, it can be concluded that during learning, students' focus or concentration on the teacher's explanation only lasts a few minutes at the beginning of learning. After that, a few minutes later, some students already looked busy with their activities, such as talking to their deskmates, which resulted in the students needing help understanding the material presented. Teachers more often apply the lecture method and do not use teaching aids when delivering material. Namely, students sit, take notes, and listen to explanations from the teacher. This teaching is less effective for students less interested in learning mathematics, so students' understanding and learning still need

improvement. This aligns with the opinion (Sudarwanto &; Hadi, 2014) That the lecture method is significant. However, it must be followed by some other method, e.g., discovery or discussion. This is done so that students feel energized, and there is no decrease in students' critical power caused by single learning that focuses on monotonous skills and activities to remember the element of play in a student.

As per Handoyo & Arif Rahman Hakim, (2016) an educator must possess creativity and innovation to provide an engaging learning atmosphere and prevent student boredom. Additionally, inventive teachers can devise and employ educational resources to enhance students' comprehension of the subject matter. The use of teaching aids in mathematics learning can help the teaching and learning process because, with the help of teaching aids, students can directly see, feel, express, and think about learning. In particular, junior high school students whose mental development is theoretically only at the stage of concrete activity need help understanding abstract concepts. Therefore, concrete props are needed. Furthermore, the implementation of instructional aids can enhance student learning outcomes in compliance with the established learning objectives and attainment criteria (KKTP).

One of the mathematics subjects covered by junior high school (SMP) grade VII pupils is mathematical algebra. One application of learning mathematical algebra material is that students can learn how to manage pocket money given by parents. However, in reality, many students still need help understanding algebra concepts. According to (Abrar, 2018) In his research, it was suggested that the difficulties faced by students were difficulty understanding concepts and difficulty solving mathematical problems. One way to overcome the difficulties students face is to create a pleasant learning atmosphere with the help of teaching aids. According to (Farihah, 2013) Props are a tool for explaining or applying mathematical concepts. One of the props that can be used as a medium for learning mathematical algebra is pirates vs. echinomonster algebra. Props are expected to cover all children's learning styles simultaneously. This hope is also based on several studies that explain that teaching aids can improve learning outcomes (Dahniar et al., 2010). Based on the description above, the researcher raised the title "Implementation of Pirates vs. Echinomonster Algebra Props to Improve Mathematics Learning Outcomes."

METHOD

According to Priyono (2016) a research technique is a way to complete a task by carefully applying one's ideas The research methodology used in this study was qualitative research. According to (Sidiq &; Choiri, 2019), qualitative research methods are those that employ a range of natural approaches to characterize occurrences in a specific natural setting with the goal of gaining a comprehensive understanding of the phenomena that the research subjects encounter. Behavior, perception, motivation, action, and other phenomena might be among them. Rather than being constrained by theory as in deep-field research, data analysis in qualitative research is inductive and based on factual findings that can be merged into a single hypothesis or theory (Abdussamad, 2021).

This study was carried out at the Al Kholili Kaliat Junior High School in Jember, which is part of the Kalisat District. Twenty-five female students in class VII A were the study's subjects. In addition, five pupils were chosen based on observations, instructor evaluations, and results from earlier TOPC tests.

The study included two instruments: question-and-answer interviews and the distribution of test questions following the use of instructional aids. The purpose of conducting these interviews is to gather data and provide an oral representation of the methods students use to solve algebraic problems.

RESULT AND DISCUSSION

The analysis uses test results and interviews to identify how students solve algebra problems. Below are the test analysis results after using props and interview results from 5 subjects. Subject writing uses codes to facilitate writing: the first student subject (S1), the second student subject (S2), the third student subject (S3), the fourth student subject (S4), and the fifth student subject (S5).

1. Analysis of the First Student Subject Test Results (S1)

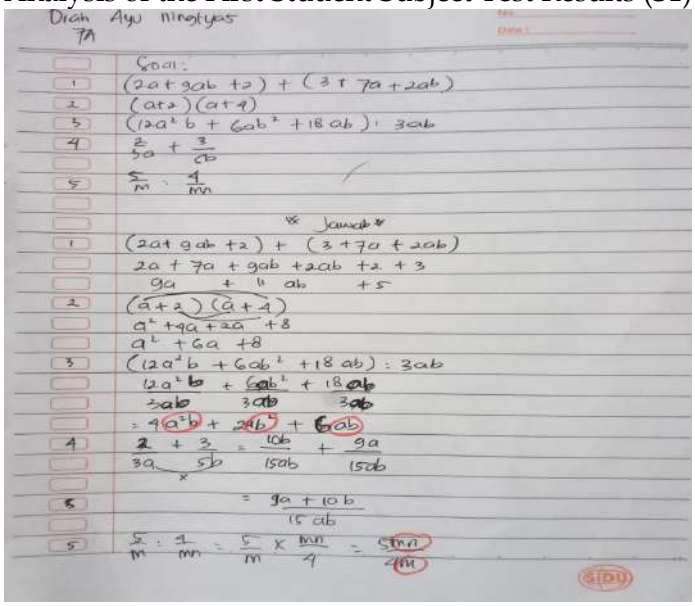

Figure 1. S1 Answer

The S1 subject can solve algebraic addition problems by first grouping variables that are equivalent, based on the test results that they completed. Subject S1 is able to use algebraic multiplication to solve the second question's problem. The S1 subject can answer the algebraic division problem in question number 3, but the solution is flawed because it doesn't reduce the rank of the same variable. By first equating the denominator, Subject S1 can answer the algebraic fraction multiplication problem in question 4. In question number 5, the S1 subject can solve the algebraic fraction division problem by changing to fraction multiplication first; it is just that the final answer is not appropriate because it does not reduce the power of the same variable. The interviews conducted with S1 subjects show that S1 subjects can quickly answer the 5 test questions. It is just that in doing questions number 3 and number 5 forgot to reduce the rank on the same variable, causing the final results to be less precise and not re-examine the answer results; this shows that the S1 subject is less careful in doing the questions so that they get a score of 60. From the analysis results, data were obtained that S1 subjects experienced an increase in learning outcomes by 0.5%.

2. Analysis of the results of the second student subject test (S2)

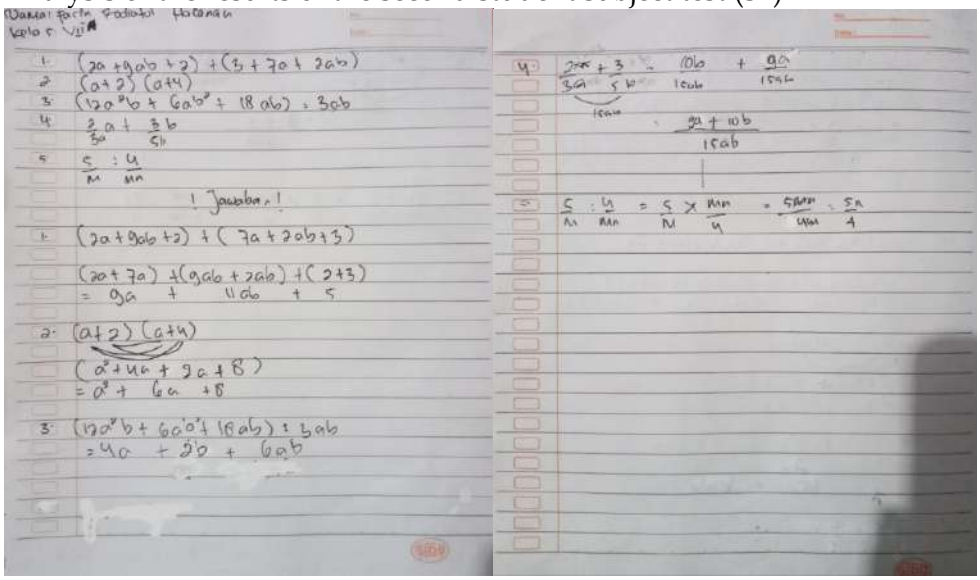

Figure 2. S2 Answer

According to S2 students' exam findings, S2 subjects can answer algebraic addition problems by first grouping comparable variables in question number 1. Subject S2 is able to answer the algebraic multiplication problem in question 2. The S2 subject is capable of solving algebraic division problems in question 3. All that needs to be done is finish the technique. Subject S2 can solve the algebraic fraction multiplication problem in question number 4 by first equating the denominator. Subject S2 can divide algebraic fractions in question number five by first converting the problem to the form of fraction multiplication. The results of interviews with S2 subjects show that S2 subjects have no difficulty answering the 5 test questions, so they get a score of 100. From the analysis results, data were obtained that S2 subjects experienced increased learning outcomes by 0.67%.

3. Analysis of Third Subject Test Results (S3)

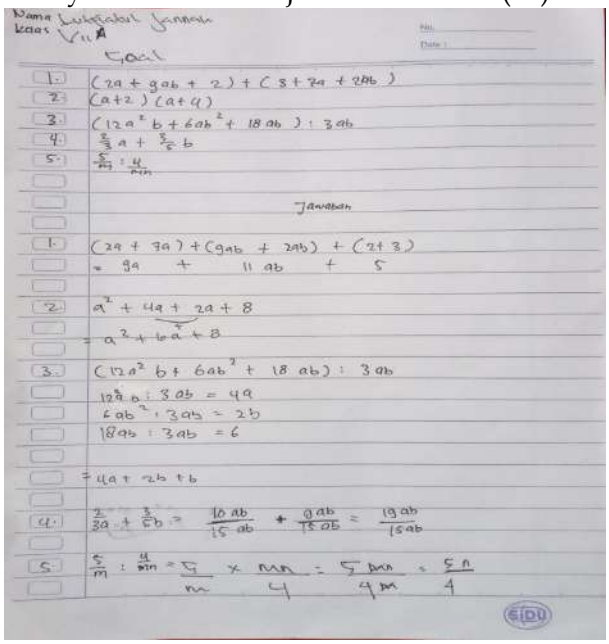

Figure 3. S3 Answer

S3 subjects may perform algebraic addition problems on question number 1 by grouping comparable variables first, according to the results of tests taken by S3 subjects. Subject S3 is able to solve the algebraic multiplication issue in question number 2. The S3 subject is able to solve algebraic division problems in question number 3. Subject S3 multiplied the numerator by the incorrect value in question number 4, which led to an incorrect final result. Subject S3 can divide algebraic fractions in question number five by first converting the problem to the form of fraction multiplication. In particular, when equating the denominator and multiplying the numerator by the equivalent number, which leads to an incorrect final result and a value of 80, the results of interviews with S3 subjects indicate that S3 subjects require greater comprehension when adding algebraic fractions. The study's findings revealed that S3 participants' learning outcomes had increased by 3%.

4. Analysis of Fourth Student Subject Test Results (S4)

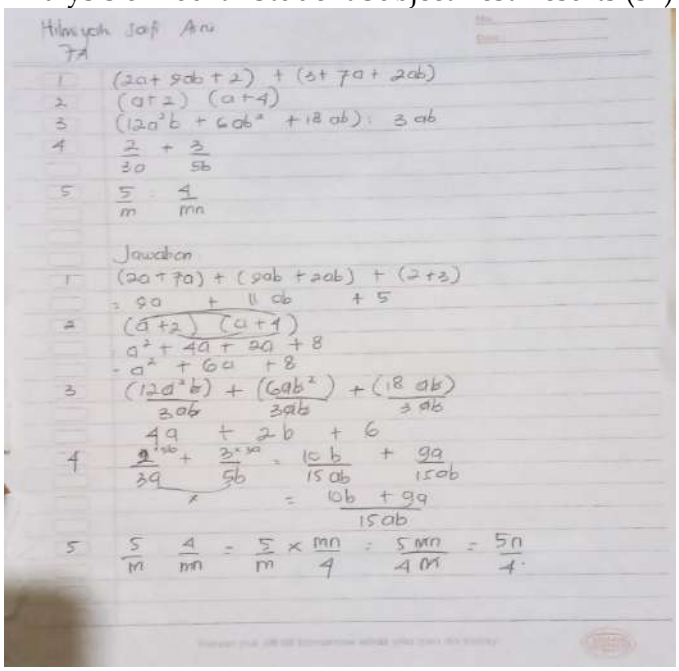

Figure 4. S4 Answer

According to the outcomes of the tests that subject S4 completed, subject S4 can solve algebraic addition problems by first grouping variables that are comparable. Subject S4 is able to answer the algebraic multiplication problem in question 2. Subject S4 is capable of solving algebraic division problems in question 3. By first equating the denominator, subject S4 can solve the algebraic fraction multiplication problem in question number 4. Subject S4 can divide algebraic fractions in question number five by first converting the problem to the form of fraction multiplication. According to S4 respondents' interview findings, they answered all five test questions with ease, earning a score of 100. Data derived from the analysis showed that learning outcomes increased by 1.5% for S4 individuals.

5. Analysis of Fifth Student Subject Test Results (S5)

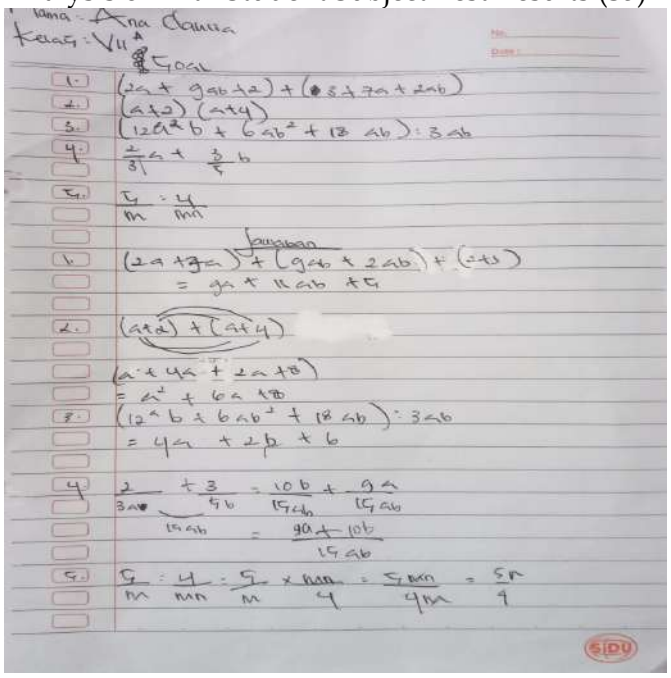

Figure 5. S5 Answer

Subject S5 is capable of solving algebraic addition problems by first grouping variables that are comparable, according to the results of tests that S5 completed. Subject S5 is able to provide an algebraic multiplication solution for problem number 2. Subject S5 is able to solve division problems involving algebra in question 3. By first equating the denominator, subject S5 can solve the algebraic fraction multiplication problem in question number 4. Subject S5 can divide algebraic fractions in problem number five by first converting the problem to the form of fraction multiplication. Interviews with S5 respondents reveal that they had no trouble answering the five test questions, and as a result, they received a score of 100. Data indicating a 1.5% increase in learning outcomes for S5 respondents was obtained from the analysis results.

Based on the justification of the test results of five subjects answering the algebraic problems above, it can be seen that, out of all the many kinds of mistakes pupils made, only two subjects answered the questions incorrectly. In comparison, the other three subjects did not make any mistakes. When students solve algebraic fraction division problems, they often make the following mistakes: (1) They fail to decrease the rank of the same variable, (2) do not multiply the numerator by the appropriate number in the algebraic fraction addition problem, (3) do not re-examine the answer results (less thorough).

CONCLUSION

From the analysis of test data and interviews with five subjects, it can be concluded that using pirates vs echinomonster algebra props improves students' mathematics learning outcomes by 1.2%.

Here are some recommendations that scholars can make: (1) advice for teachers to be more creative and innovative in delivering material to students, namely by using mathematical teaching aids; (2) suggestions for students should frequently practice doing questions regularly in order to improve numeracy skills more accurately and determine the correct final results (3) suggestions for other researchers, can continue further research similar to developing this research.

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