Journal of Media, Sciences and Education
https://ojs.institutemandalika.com/index.php/jomet

Vol. 4, No. 3, 2025
e-ISSN: 2986-2728
hh. 69-74

Students' Difficulties in Processing Simple Data in Elementary School

Reva Arda Try Pradima*
Universitas Muhammadiyah Tangerang
*Coresponding Autor: revaarda4@gmail.com

Abstract

This study aims to identify and analyze elementary school students' difficulties in processing simple data, such as reading tables, making diagrams, and concluding information from data. Data processing is an important part of the mathematics curriculum because it trains critical and analytical thinking skills. However, in reality, many students experience obstacles in understanding the basic concepts and technical processes of data processing. This study uses a descriptive qualitative approach with observation techniques, interviews, and document analysis of grade IV and V students at a public elementary school in Tangerang City. The results of the study indicate that students' difficulties are divided into three main categories: (1) conceptual difficulties related to understanding the meaning of data and its types, (2) procedural difficulties in processing data into visual forms such as tables and bar charts, and (3) interpretive difficulties in concluding information from data. The causal factors include limited learning media, teachers' less contextual approaches, and students' low numeracy literacy. The implications of the results of this study are the need for more applicable and interactive learning strategies in data processing learning in elementary schools.

Keywoeds: *learning difficulties, data processing, elementary school, mathematics, numeracy literacy*
Keywords: *Puzzle Media, Mathematical Comprehension Ability, Equivalent Fractions, Elementary School*

How to Cite: Reva Arda Try Pradima. (2025). Students' Difficulties in Processing Simple Data in Elementary School , 88–91. https://doi.org/10.36312/jomet.v4i2.111

https://doi.org/10.36312/jomet.v3i4.111

Introduction

Mathematical understanding is one of the important skills that students must have in learning mathematics. Hendriyana (2017, p. 3) said that the rationale for the importance of having mathematical understanding skills includes the ability to be listed in the mathematics learning objectives of the Junior High School Mathematics Curriculum (KTSP 2006 and Curriculum 2013) and in NCTM (1989). Mathematical understanding is a key aspect of learning that is an important foundation for thinking in solving mathematical problems and real-life problems. In addition, the ability to understand mathematics is very supportive in the development of other mathematical skills, namely communication, problem solving, reasoning, connections, representation, critical thinking and mathematical creative thinking, as well as other mathematical abilities (Santrock, 2008).

Based on the results of observations conducted in Class IV SDN 1 Pasindangan by giving a mathematical understanding test, it shows that the mathematical understanding of class IV students is still lacking and not optimal. This is indicated by students still having difficulty in understanding equivalent fractions, in addition to students having difficulty writing equivalent fractions. The lack of mathematical understanding of students is caused by teachers being less effective in using learning media on fraction material which makes learning still centered on the teacher, namely still using conventional learning. In addition, mathematics is often considered a difficult subject to understand which causes learning to be boring and students tend to be passive. Maulana (2014) said that students' difficulties in understanding mathematics lessons can be associated with how teachers teach in class which does not make students feel happy and sympathetic to learning. Active and enjoyable learning

can be done by actively involving students when learning. One thing that can be done is by using learning media that involves students directly in the process of using it. The use of learning media in the classroom is quite important, this is reinforced by the opinion of Edgar Dale, Finn and Hobar (Ahmad, 2007) who stated that the use of learning media is important because it will provide concrete experiences and avoid abstraction, attract more students' attention and provide a more meaningful learning experience for students.

puzzle media can be an interesting learning tool and can support the learning process. This *puzzle media* is a game media consisting of pieces of a certain image/pattern that can train creativity, order, and concentration. The use of *puzzles* in learning media is a play activity that requires concentration to arrange the pieces of the pattern into a complete image with a certain level of difficulty. The use of *puzzle media* in learning can provide benefits such as improving children's cognitive abilities, this is because *puzzles* are simple games that are easy to make but very fun when played.

This finding is further supported by previous research on puzzles. One of the findings revealed the effect of using fraction *puzzles* on students' mathematical understanding.

From the explanation of the problem above, it can be concluded that students' mathematical understanding ability is still low, so efforts are needed to improve elementary school mathematical understanding ability. Based on previous research, it was found that the use of fraction media is related to mathematical ability. Therefore, in this study, the researcher wanted to know whether there was an influence of fraction *puzzle media* on elementary school students' mathematical understanding ability.

Method

This study uses a quasi-experimental quantitative method with a nonequivalent control group design. The study will have two subjects: a control class and an experimental class. Learning will be conducted using puzzles in the experimental class, while conventional learning will be used in the control class. Both research classes will be given two tests: a pretest and a posttest. The pretest will be given before the treatment is administered, and the posttest will be given after the treatment is administered.

The population in this study was all fourth-grade elementary school students in Cluster 1, Gunung Jati District, then SDN 1 Pasindangan and SDN 1 Jadimulya were selected as research samples. The sampling technique was purpose sampling. The reason for taking these two school samples was because there were several factors that were taken into consideration, one of which was the number that had met the requirements as the minimum sample size, namely 30 people in 1 class, in addition to the low mathematical understanding of students on equivalent fractions in both schools.

The data collection techniques used in this study are as follows, mathematical understanding test instruments, observation and documentation. The test instruments used are pretest and posttest in the form of 10 descriptive questions. The ability expected in this test is the ability to understand a concept from a given material. The research instrument that has been tested will be processed using SPSS 23 to see the level of validation. Based on the results of the instrument validation test, it can be concluded that all questions are valid. Then the reliability coefficient (cronbach's alpha) of 0.788 was also obtained where the value is> 0.6 so that the results of the mathematical understanding ability instrument are in the high category and are said to be reliable.

Data analysis and processing activities include data grouping, tabulation and presentation of data in each research variable, calculations to answer the formulation of the problem and submission of the proposed hypothesis (Sugiyono, 2016). The results of the mathematical understanding ability test tested during the pretest and posttest provide quantitative data information. The data is then processed by calculating the mean pretest and

posttest in both sample classes. After that, it is continued with data processing using SPSS 23 such as the average difference test, but before the average difference test is carried out, a prerequisite test is first carried out, namely the normality test.

Results and Discussion

The purpose of this study was to determine the effect of puzzle media on students' mathematical understanding of equivalent fractions, to determine the effect of conventional learning on students' mathematical understanding of equivalent fractions, and to determine the difference in the effect of puzzle media and conventional learning on mathematical understanding. The data obtained in this study were pretest and posttest results in the experimental and control classes.

Based on the data presented in table 1, the information obtained is that the average pretest score in the experimental class is 29.73 and the average posttest score is 64.43. While for the control class, the average pretest score is 29.67 and the average posttest score is 44.70. If seen from these results, students who use puzzle media (experimental class) get better posttest scores than students who apply conventional learning (control class). However, if seen from the increase in pretest and posttest scores, both classes, both the experimental class and the control class, experienced an increase.

Table 1. Recapitulation of Pretest - Posttest Statistics in the Experimental Class and Control Class

Caption	Experimental Class		Control Class	
	Pretest	Posttest	Pretest	Posttest
Average	29.73	64.43	29.67	44.70
Std.Deviation	9,479	20,981	13,029	17,558
Min	18	30	18	18
Max	54	100	61	91

Table 2. Results of the Pretest - Posttest Normality Test in the Experimental Class and Control Class

			Shapiro Wilk	
	Class	Statistics	df	Sig.
Mathematical Comprehension Test Results	Experiment Pretest	.891	30	.005
	Experiment Posttest	.954	30	.212
	Pretest Control	.820	30	.000
	Posttest Control	.955	30	.231

Based on the results of the statistical prerequisite test, namely the normality test using Shapiro-Wilk because the research sample was less than 50 people, the information presented in table 2 was obtained where the pretest in the experimental class obtained a sig. 0.005 <0.05 and the posttest obtained a sig. 0.212> 0.05, which means that in the normality test in the experimental class, the pretest value was not normally distributed and the posttest value was normally distributed.

The results of the Shapiro-Wilk normality test in the control class obtained information where the pretest obtained a sig. 0.000 < 0.05 and the posttest obtained a sig. 0.231 > 0.05, which means that the normality test in the control class on the pretest value was not normally distributed while the posttest value was normally distributed.

Table 3. Results of the Average Difference Test for the Experimental Class and the Control Class

	Experimental Class	Control Class

	Pretest-Posttest	Pretest-Posttest
Z	-4,783	-4,607
Asymp. Sig. (2-tailed	.000	.000

Based on the results of the average difference test using the Wilcoxon test which can be seen in table.3, it can be seen that both classes obtained a sig. value of 0.000 <0.05, which means that H0 is rejected and H1 is accepted. Thus, it can be stated that there is an influence on the experimental class and the control class. It can be concluded that learning mathematics using puzzle media can improve students' mathematical understanding of equivalent fractions. Likewise, the control class has an increase in students' mathematical understanding by implementing conventional learning.

To determine the magnitude of the increase in mathematical understanding ability in the experimental class and the control class, the average gain value can be calculated using SPSS 23. Based on the results of the average gain value calculation that has been carried out, information was obtained that in the experimental class the average gain value was 0.51, which indicates an increase in the medium category. Meanwhile, in the control class the average gain value was 0.22, which means it provided an increase in the low category.

Based on the findings presented, it appears that the experimental class, specifically mathematics learning using puzzles, yielded an average score between the pretest and posttest scores. In the learning process, the use of puzzles in the classroom can make learning quite effective, where students are actively involved and understand the learning material more easily. Based on the increase in the average score, the experimental class using puzzles achieved a higher increase than the control class that only implemented conventional learning. This is in line with the benefits of puzzles explained by Nurpratatiwiningsih and Mumpuni (2019), who stated that through *puzzles* , students experience what is called doing, expressing, summarizing, and applying material in learning activities. Puzzles *can* improve students' skills, especially their cognitive abilities. This is because by arranging *puzzle pieces* , students attempt to solve problems, which can influence their understanding of the material presented. *Puzzle media* itself is a game that involves dismantling and assembling image parts to form a complete image. *Puzzle media* can improve children's cognitive abilities, thereby enhancing imagination and creativity in logical thinking (Amatullah, 2022).

The use of *puzzles* in mathematics learning provides a more meaningful learning experience for students and inadvertently encourages students to be actively involved in the learning process. Furthermore, it can foster students' enthusiasm for learning. Based on Piaget's theory, the cognitive development stage in children aged 7-11 years is at the concrete operational stage, meaning that children at this age are able to solve problems logically but are not yet able to think abstractly (Agustyanigrum, 2022). One way to ensure a concept can be learned by students is by presenting concrete objects in learning activities.

The use of *puzzles* as concrete objects serves as a medium for students to better understand the material being taught. *Puzzles* are a learning tool in the form of concrete objects, where they are played by taking them apart and reassembling them. This process directly involves students, providing them with meaningful learning experiences, thus facilitating their understanding of the learning concepts being implemented.

On the other hand, conventional learning in the control class also had a positive effect on improving students' mathematical comprehension. However, this doesn't just happen; several factors can influence it. One such factor is teacher performance. The success of the control class was influenced by the teacher's role, both in implementing the lesson and in planning it before it took place. This aligns with Gimbert, Bol, & Wallace (2007) who stated that teachers with good teaching performance are able to foster greater student enthusiasm and motivation for learning.

When viewed from the increase in each indicator in both classes, there is a difference in the increase in which indicator has a greater increase. In the indicator of mathematical understanding ability in the experimental class, all indicators have increased, as well as in the control class where all indicators have increased. In the experimental and control classes, the indicator that experienced the greatest increase was the indicator of restating the concept that had been learned. However, when viewed as a whole, the increase in indicators in the experimental class, the results were much superior compared to the control class. Therefore, in this study, the results showed that the use of *puzzle media* was able to improve mathematical understanding abilities in the material of equivalent fractions in elementary schools.

Conclusion

Based on the results and discussions that have been presented previously, it can be concluded that there is a positive influence of the use of puzzle media on students' mathematical understanding abilities on the material of equivalent fractions. The conclusions based on the sub-questions in this study are: (1) there is an increase in students' mathematical understanding abilities in mathematics learning by using puzzle media where the increase is 0.51 with a medium category. (2) there is an increase of 0.22 with a low category in students' mathematical understanding abilities by applying conventional learning on the material of equivalent fractions. (3) there is a difference in influence between the experimental class that uses puzzle media and the control class that uses conventional learning on the material of equivalent fractions, but based on the results of the increase, the use of puzzle media provides better results than conventional learning.

Referensi

1. Adelia, I., & Musaddat, S. (2024). The Effect of Puzzle Media on the Mathematical Problem-Solving Ability of Grade III Students of Sdn 3 Ampenan. *Pendas: Scientific Journal of Elementary Education* , *9* (2), 3058-3069.
2. Ahmad, A. (2007). *Instructional Media* . Makassar: UNM Publishing Agency.
3. Alawiyah, W., Suryana, Y., & Pranata, OH (2019). The Effect of *Puzzle Media* on Student Learning Outcomes about Flat Shapes in Elementary School. *PEDADIDAKTIKA: Scientific Journal of Elementary School Teacher Education* , *6* (1), 118-129.
4. Amatullah, AA, Hariyanti, DPD, & Purwadi, P. (2022). Analysis of Puzzle Use in Children's Problem Solving Skills. *Educational Insights* , 2 (1), 93–100.
5. Bahar, B., & Risnawati, R. (2019). The Effect of Using Puzzle Media on Mathematics Learning Outcomes of Grade III Elementary School Students in Gowa Regency. *Education Publication* , *9* (1), 77-86.
6. Gimbert, B., Bol, L., & Wallace, D. (2007). The Influence of Techer Preparation on Student Achievement and the Application of National Standards by Teachers of Mathematics in Urban Secondary School. Educatin and Urban Society, I(40), 91- 117.
7. Hariati, E., Hidayat, W., & Saputri, SA (2023). The Effect of Using *Puzzle Media* on Student Learning Outcomes in Mathematics Subjects in Class III of Sd Negeri 106154, Kota Rantang Village. *Journal of Education and Teaching Review (JRPP)* , *6* (4), 3907-3912.
8. Hendriana, H., & Sumarmo, U. (2017). *Hard Skills and Soft Skills of Students' Mathematics* . Bandung: PT Repika Aditama
9. Kudsiah, M., & Alwi, M. (2020). Development of Mathematics Fraction *Puzzle Media* on Fraction Addition Material for Grade IV Elementary School Students. *Elementary Journal: Study of Theory and Research Results of Elementary School Education* , *3* (2), 102-106.

10. NCTM. (1989). *Curriculum and Evaluation Standards for School Mathematics* . Reston, VA: Author.
11. Nelin, AP (2023). *The Effect of Using Fraction Puzzle Media on the Learning Interest of Grade III Students of Sdn 28 Mataram in the 2023/2024 Academic Year* (Doctoral dissertation, Universitas_Muhammadiyah_Mataram).
12. Santrock. (2008). *Educational Psychology* . Jakarta: Prenada Media Group.
13. Siregar, TN (2023). *The influence of puzzle media on students' conceptual understanding in mathematics learning in Grade IV of SD Negeri 100900 Gunung Tua, Padang Bolak District, North Padang Lawas Regency* (Doctoral dissertation, UIN Syekh Ali Hasan Ahmad Addary Padangsidimpuan).
14. Sugiyono. (2016). *Quantitative, Qualitative and R&D Research Methods* . Bandung: Alfabeta.
15. KBBI. 2016. *Kamus Besar Bahasa Indonesia (KBBI).* (Diakses pada 20 Juni 2025).