



The Use of Raktepel Media (Rainbow Egg Rack) to Improve Mathematical Concept Understanding of Grade II MI Students

Received: July 7, 2023

Accepted: July 24, 2023

Published: September 18, 2023

Fatkul Arifin & Dinda Muzdalifah

^{1,2} *State Islamic University (UIN) Syarif Hidayatullah Jakarta*

¹ *Contributor Email: fatkhul_arf@uinjkt.ac.id*

Abstract

The utilization of teaching media is still very limited. Especially for teaching math concepts in madrasah ibtdaiyah. This study aims to explain the effect of using Raktepel (Rainbow Egg Rack) media on students' understanding of mathematical concepts on multiplication and division material in class II MI Nurul Islamiyah Kedaung. The research method used is a quasi-experiment with a Posttest-Only Group Design research design. The sample in this study consisted of an experimental class of 23 students and a control class of 23 students. The results showed that students who were taught using Raktepel media obtained a higher average score than the average score of the mathematical concept understanding ability of students who were taught without using Raktepel media. This can be seen from the results of the t-test of the post-test of the experimental class and the control class of 0.007 with a significance level of 0.05. So, it can be concluded that this Raktepel media has a significant effect on helping grade II students at MI Nurul Islamiyah Kedaung to understand the concepts of multiplication and division.

Keywords: *Mathematical Concepts, Media, Raktepel, Student, Elementary School*

Abstrak

Pemanfaatan media ajar masih sangat terbatas sekali. Terutama untuk membelajarkan konsep matematika di madrasah ibtdaiyah. Penelitian ini bertujuan untuk menjelaskan pengaruh penggunaan media Raktepel (Rak Telur Pelangi) terhadap pemahaman konsep matematis siswa pada materi perkalian dan pembagian di kelas II MI Nurul Islamiyah Kedaung. Metode penelitian yang digunakan adalah kuasi eksperimen dengan desain penelitian Posttest-Only Group Design. Sampel dalam penelitian ini terdiri atas kelas eksperimen yang berjumlah 23 siswa dan kelas kontrol yang berjumlah 23 siswa. Hasil penelitian menunjukkan bahwa siswa yang diajarkan menggunakan media Raktepel memperoleh nilai rata-rata yang lebih tinggi dibandingkan dengan nilai rata-rata kemampuan pemahaman konsep matematis siswa yang diajarkan tanpa menggunakan media Raktepel. Hal ini dapat dilihat dari hasil uji t-test posttest kelas eksperimen dan kelas kontrol sebesar 0,007 dengan taraf signifikansi 0,05. Maka dapat disimpulkan bahwa media Raktepel ini berpengaruh signifikan untuk membantu siswa kelas II di MI Nurul Islamiyah Kedaung dalam memahami konsep perkalian dan pembagian.

Kata Kunci: *Konsep Matematika, Media, Raktepel, Siswa, Madrasah Ibtidaiyah*

A. Introduction

Education is an intellectual process for life nation, increasing the quality of Indonesian people and realizing the objective of the Indonesian country. The process, walked by expected goals, required various enhancement qualities in the world of education. Learning mathematics is part of related science with aspects of life. You have lots of daily problems that you can resolve with math. Mathematics needs to be given to students to equip them to think logically, analytically, systematically, critically, and creatively and work together. Mathematics is also a source of various knowledge. Because, math is very important For the study (Fatqurhohman, 2016).

The mathematics subject matter given to elementary school students is crude and continuous material so that if students have mastered every basic concept, they can understand more difficult and higher mathematical concepts. This is the basis that students must at least be able to master most of the mathematical concepts at the basic level to not cause learning difficulties in understanding mathematical concepts at a later stage.

Problems understanding draft mathematics this not an easy problem. Because in reality, never mind For can understand draft more math tall (PISA, 2018). For understanding drafts, even the most basic math, lots of experienced students have trouble. Subjects' mathematics until the moment This is Still considered a scary thing for students because material considered lessons difficult for understood. Then a teacher should have an interesting learning strategy, and maybe the method used must be interesting so students learn more Spirit in math.

At the Elementary school level, mathematics must be based on concrete form. Viewed from the cognitive aspect, according to Piaget, this period is in the concrete operational stage, which is characterised by the ability to (1) classify (group) objects based on the same characteristics; (2) composing or associating (connecting or calculating) numbers or numbers; and (3) solving simple *problems* (Öğretmenn et al., 2008). Mathematics is knowledge; mathematics has characteristic features special, including abstract,

deductive, consistent, hierarchical, and logical. Soejadi state that abstract mathematics Because the object is basically abstract, that is, facts, concepts, operations and principles (Afrilina, 2017).

According to NCTM, five process abilities must be mastered by students through learning mathematics, namely: (1) problem-solving; (2) reasoning and *proof*; (3) connection (*connection*); (4) communication (*communication*); and (5) representation (*representation*) (Bolstad, 2023). These five abilities will develop if the student understands concepts through mathematics. In NCTM, it is stated that understanding is a very important aspect of learning mathematics (Thien, 2016).

Based on observations conducted by Researchers at MI Nurul Islamiyah Kedaung. There 9 out of 25 students had difficulty understanding the concept of multiplication and division; on average, they were wrong in applying the idea. They were not careful in filling out the questions, based on giving pre-tests to classes that had studied multiplication and division material first. Apparently, there are still many who experience difficulties.

After the researcher gave the initial test to the class that had studied multiplication and division first, the researcher tried to see the condition of class II, how they worked out the multiplication and division problems the teacher gave, and how the teacher conveyed the lesson. It turned out that many students still had difficulty answering these questions; only a few answered the questions correctly. Because students only demanded to answer the question with correct results without knowing draft multiplication and division.

This is seen when the teacher asks about conceptual understanding in the form of multiplication and division problems. It can be seen when students are given questions regarding the meaning of 2×5 , $10 : 2$, and students immediately state the results, and when asked to explain how the concept is, they are still confused and still like to change the position of the numbers in explaining it. Even though as is well known that multiplication is repeated addition. In contrast, the division is repeated subtraction, it means

that if the multiplication problem is 2×5 , it means that it is equal to $5 + 5 = 10$ and if the division problem is $10 : 2$, it means that it is similar to $10 - 2 - 2 - 2 - 2 = 0$, so $10 : 2 = 5$. However, many students who have not can understand the question's meaning Because of a lack of understanding of draft multiplication and division then got concluded that understanding draft multiplication and division mathematics in students in class II is still not enough in understanding draft multiplication and division math.

Understanding concepts is the most important part of learning mathematics, as Arifin stated that mathematics subjects emphasise concepts. This means that in studying mathematics, students must first understand the concept of mathematics to solve problems and apply this learning in the real world (Arifin & Herman, 2017).

Understanding concepts is an ability to understand comprehensive and functional mathematical ideas; understanding concepts is more important than memorising (Afriani et al., 2019). Therefore, give correct directions or guidance to students. Because it is a little wrong to provide advice or recommendation to students, the concept received by students will be wrong, and students will also later apply the wrong concept.

Experts in education mathematics agree that one objective in learning mathematics is understanding math. Studying mathematics with deep and meaningful understanding will benefit students feel benefit mathematics every day. Students who study mathematics with performance are expected to be capable of communicating the concept that has been understood at the time and face every problem in learning or life daily (Wildaniati & Afriana, 2019).

Several must factors are noticed in learning, including teachers, students, methods, media, etc. One possible effort teacher makes to increase mastery of student-to-material lessons is with repair process teaching. Success, a student for can control something material lessons; besides being determined by factors students, like level of intelligence, craft, and perseverance, are also determined by external factors, among others, namely

strategies and methods of learning that the teacher uses when conveying material lesson.

To help participant education reach an abstract level, the role of the media follow help; the teacher's ability to choose the media is a very decisive quality of the KBM he manages. The teacher is one of the living-learning media in class because The teacher's performance determines the success of studying students internal media use learning is really important for students to understand what they learn (Kang & Cogan, 2022).

In the efforts of a teacher to increase students' ability to understand draft multiplication and division, a teacher must Use interesting and innovative media. For learning draft multiplication and distribution, teachers use the Media Rainbow Egg Shelf (Raktepel). Using Raktepel media expected can motivate students to Study draft multiplication and division. The use of the press aims to make students No feel that learning mathematics Is difficult, so the use of media is interesting and can make students happy and active Because they study while playing (Wilkins, 2015).

According to Crespo, No Can Again depends on the lecture method and participant education critical with the faster development of science and technology (Crespo & Harper, 2020). According to Nyoman, a student-centred learning approach is learning that places students as learning subjects and modern activities. So, in this approach, students have a wide-open opportunity to be creative and develop their potential through direct activities according to their interests and talents.

Various teaching methods needed in learning so tool sense can function optimally because address sense is the *golden gate*, door gate knowledge. According to Heruman, "In mathematics, every abstract concept that students just understand needs to be given reinforcement immediately so that it settles and lasts long in the students' memory so that it will be embedded in their mindset and action patterns (Fahrudhin et al., 2018). For this purpose, learning through action and understanding is needed, not just memorising or remembering facts, because students will easily forget this.

One of the media that can be used to help students understand the concept of mathematical arithmetic operations is the rainbow egg shelf media. The use of rainbow egg rack media is expected to attract students to learn mathematics to increase their conceptual understanding of multiplication and division material.

Media Raktepel is an abbreviation for Rainbow Egg Rack; using this medium, students are expected to be capable of understanding draft multiplication and division. Because of the school where I visit, his students still often experience difficulty understanding draft multiplication and division. How can teachers teach students with a different and interesting look, then researchers hope that creating learning media simple and affordable, such as rack egg rainbow plus seeds, can help students understand the concept of multiplication and division (Apriliani, 2018).

B. Method

Study this was held with the Quasi-Experimental method (Sari, 2017). The purpose of quasi-experimental research is to obtain information which is an estimate for information that can be obtained with actual experiments in circumstances that do not allow controlling and or manipulating all relevant variables (Solichin, 2017).

Quasi-experiments were used because finding a control group or class in the study was difficult. Class II A, with a total of 23 students and Class II B, with 23 students as the control group, were selected as the experimental group. A class experiment is a class whose learning uses Rainbow Egg Shelf media for draft multiplication and division. In comparison, class control is a class that does not teach using Rainbow Egg Shelf media for draft multiplication and division.

Researcher data collection techniques do in this research with use tests, interviews, and documentation. Design This purpose was chosen Because the researcher wanted to know the measured data from score/grade

mathematics students using Rainbow Egg Shelf media for understanding draft students on the material draft multiplication and division.

C. Results and Discussion

Based on the research results, there is a difference between class experiment with class control that is given class something *treatment* with the type that does not provide *treatments*. Happen difference grade point average experiment is the average value of 78.00; meanwhile, the class control's average weight is 68.22. In addition, *the post-test* data results after doing different learning against two classes, then value obtained *t* value of 0.007 with Sig level. 0.05. Then got concluded that there is Influence Use of Raktepel Media to Ability an understanding of Mathematical Students on Multiplication and Division Concepts.

Research Hypothesis Test

Testing hypothesis This is done with the analysis of the *independent sample T-test* with SPSS application program assistance 22. Aim with use testing This *Independent Sample T-test*, according to Santoso, want to know if There is a difference in the mean (*mean*) between the two populations by looking at the two samples (Solichin, 2017). Taking decision hypothesis test results own criteria as follows:

- a. If the probability value < 0.05 , H_0 is rejected, and H_a is accepted.
- b. If the probability value > 0.05 , then H_0 is accepted, and H_a is rejected.

Table 1. Hypothesis Test Results

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|----------------------|---------------------------------|---|------|------------------------------|--------|-----------------|------------------|-----------------------|---|--------|
| | | F | Sig. | Q | df | Sig. (2-tailed) | Mean Differences | std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Results _posttest | Equal variances assumed | ,640 | ,428 | 2,852 | 44 | ,007 | 9,783 | 3,430 | 2,869 | 16,696 |
| | Equal variances are not assumed | | | 2,852 | 43,096 | ,007 | 9,783 | 3,430 | 2,865 | 16,700 |

Based on the table data results on that hypothesis test, they can conclude hypothesis testing using the t-test *Independent Sample T-test* For the second group, the own difference in average yield test between second class those who use Rainbow Egg Shelf media (Raktepel) and those who do not use Rainbow Egg Shelf media has the level of 0.007. this data show that significance $0.007 < 0.05$ means H_0 is rejected or H_a accepted. In the end, the data prove that there is an Influence Use of Raktepel Media To Ability understand Draft Mathematical Students on Multiplication and Division Material (Suyuti et al., 2018).

This study lasted for 11 days which was included in the *post-test activities*. In this research activity, the researchers used two classes, namely the experimental and control classes. Where the practical lesson was given treatment in learning, namely by using the media Rainbow Egg Rack (Raktepel) in learning activities, while the control class was not given treatment, namely not using Rainbow Egg Shelf media (Raktepel) in learning activities. However, although there is a difference in both categories, the submitted material _ is still The same, only in the learning process, just different (Vula, 2011).

Based on the research results, they are learning math in-class experiments and class control, basically activity teaching the same. Only the difference is in the treatment given. In class experimental learning process using Rainbow Egg Rack media (Raktepel) in the learning process takes place in the learning process student is requested to finish the question using that medium. Meanwhile, in class, control the learning process. No given treatment or No use of Rainbow Egg Rack media (Raktepel), only teacher-centred or method lecture, where the teacher only explains. Then students listen and do questions that the teacher has given.

They used rack egg rainbow plus seeds to attract students' attention to studying multiplication and division. With this medium, researchers invite students to Study while playing how the researcher prepares the media rack

egg rainbow and seeds (can also use marbles). Then researcher asked one of the students to the front class to demonstrate method multiplication while the other students noticed carefully. Student the answer question multiplication, for example, $7 \times 5 = \dots$? Then researchers ask students to take grain and fill seven holes in the shelf eggs, five each every the hole. Then students sum up all the seeds in each hole with invite the other students to count together $5+5+5+5+5+5+5 = 35$. So, $7 \times 5 = 35$.

Researchers appreciate students who appear by inviting all students to clap hands. After That, all students will scramble to demonstrate it. The researcher then distributes the media to each group so all students Can do it. Likewise with division, the researcher brings someone back student to the front and works question division, for example, $12 : 4 = \dots$? Then the researchers ask the student to take 12 seeds to be served in four holes. Students ago entered one by one grain them into every hole until the hole finished. After That researcher invites the student to count together How many seeds are inside every hole. It turns out every hole contains 3 sources. Means $12 : 4 = 3$.

Using this medium, researchers hope students are happy and enthusiastic to follow the lesson. Memorable events will be stored in the memory brain. So, before the study closed, the teacher guided the student to the interesting conclusion that multiplication is repeated addition and division is subtraction repeated. the use of methods and media that are in accordance with the characteristics of children really helps them to understand math concepts that are considered difficult (Nurjaya, Rahayu, & Sari, 2023).

D. Conclusion

Based on the results of the research conducted, it can be concluded that there is an influence on the use of Raktepel media on students' mathematical understanding abilities on the concept of multiplication and division in class II MI Nurul Islamiyah Kedaung students. This is proven by the results test average score final (post-test) students' class experiment, which is as big as

78.00 and the class control of 68.22, yielding the post-test showing that the class experiment is taller than the class control. In addition, it is also shown in the results hypothesis *post-test* that the get t value has a level of 0.007 with a level significance of 0.05. this data show that significance $0.007 < 0.05$ means H_0 is rejected or H_a accepted. Ultimately, the data prove that there is an Influence Use of Raktepel Media to Ability understanding Mathematical Students on Multiplication and Division Concepts.

References

- Afriani, d., fardila, a., & septian, g. D. (2019). Penggunaan metode jarimatika dalam meningkatkan kemampuan berhitung perkalian pada siswa sekolah dasar. *Journal of elementary education*, 02, 5.
- Afrilina, f. (2017). Pengaruh penggunaan alat peraga corong berhitung terhadap pemahaman konsep siswa pada materi perkalian dan pembagian.
- Apriliani, i. T. (2018). Eksperimentasi model pembelajaran kooperatif tipe student team's achievement divisions dan think pair and share terhadap kemampuan pemahaman konsep matematis siswa. *Jurnal peka : pendidikan matematika*, 1(2).
- Arifin, f., & herman, t. (2017). The influence of e-learning model web enhanced course to conceptual understanding and self-regulated learning in mathematics for elementary school students. *Tarbiya: journal of education in muslim society*, 4(1), 45–52. <https://doi.org/10.15408/tjems.v4i1.5536>
- Bolstad, o. H. (2023). Lower secondary students' encounters with mathematical literacy. *Mathematics education research journal*, 35(1), 237–253. <https://doi.org/10.1007/s13394-021-00386-7>
- Crespo, s., & harper, f. K. (2020). Learning to pose collaborative mathematics problems with secondary prospective teachers. *International journal of educational research*, 102, 101430. <https://doi.org/10.1016/j.ijer.2019.05.003>
- Fahrudhin, a. G., zuliana, e., & henry, s. B. (2018). Peningkatan pemahaman konsep matematika melalui realistic mathematic education berbantu alat peraga bongpas. *Anargya: jurnal ilmiah pendidikan matematika*, 1(1). <http://jurnal.umk.ac.id/index.php/anargya>
- Fatqurhohman. (2016). Pemahaman konsep matematika siswa dalam menyelesaikan masalah bangun datar. *Jurnal ilmiah pendidikan matematika*, 4(2), 127–133.
- Kang, h., & cogan, l. (2022). The differential role of socioeconomic status in the relationship between curriculum-based mathematics and

- mathematics literacy: the link between timss and pisa. *International journal of science and mathematics education*, 20(1), 133–148. <https://doi.org/10.1007/s10763-020-10133-2>
- Nurjaya, Rahayu, N., & Sari, R. (2023). Deskripsi minat peserta didik dalam belajar matematika melalui permainan. *Al-Azkiya : Jurnal Ilmiah Pendidikan MI/SD*, 8(1). Retrieved from <https://journal.iainlangsa.ac.id/index.php/azkiya/article/view/6511>
- Öğretmenn, m., ruttn olmayan, a., problemlerr, m., becerrlerr, ç., bu, v. E., düşüncelerr, k., altun, m., & sezggn memnun, d. (2008). *Journal of theory and practice in education articles/ makaleler*. 4(2), 213–238.
- Pisa. (2018). Matematika pisa 2022 kerangka (draft).
- Sari, R. (2017). *Pengantar penelitian kuantitatif*. Yogyakarta: Deepublish.
- Solichin, m. (2017). Analisis daya beda soal, taraf kesukaran, validitas, butir tes, interpretasi hasil tes dan validitas ramalan dalam evaluasi pendidikan. *Dirasat: jurnal manajemen & pendidikan islam*, 2(2), 192–213.
- Suyuti, f. W., ridlo, l., & riwanto, m. A. (2018). Penggunaan media rak telur rainbow dalam meningkatkan hasil belajar matematika materi perkalian dan pembagian kelas ii sd negeri karangasem 01. *Jurnal pancar*, 2(2), 37–41.
- Thien, l. M. (2016). Malaysian students' performance in mathematics literacy in pisa from gender and socioeconomic status perspectives. *Asia-pacific education researcher*, 25(4), 657–666. <https://doi.org/10.1007/s40299-016-0295-0>
- Vula, e. (2011). Collaborative action research: teaching of multiplication and division in the second grade. *Turkish online journal of qualitative inquiry*, 2(2).
- Wildaniati, y., & afriana, a. (2019). Penggunaan alat peraga untuk meningkatkan hasil belajar siswa kelas v sd n 2 Gunung Katun kecamatan Baradatu. *Dewantara*, VII (1), 56–72.
- Wilkins, J. L. M. (2015). Standards-based mathematics curricula and the promotion of quantitative literacy in elementary school. *International Journal of STEM Education*, 2(1). <https://doi.org/10.1186/s40594-015-0032-x>