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TEACHER STRATEGIES IN IMPROVING THE UNDERSTANDING OF MULTIPLICATION AND DIVISION MATERIAL IN THE MATHEMATICS SUBJECT OF GRADE 3 STUDENTS AT THE INTEGRATED MUHAMMADIYAH ELEMENTARY SCHOOL IN PONOROGO

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Abstract

This paper seeks to investigate the teacher's approaches in enhancing the understanding of multiplication and division concepts among grade III learners at SD Muhammadiyah Terpadu Ponorogo. In conducting this research, a descriptive qualitative approach is utilized. The method of data collection involves observation, interviewing, and documentation with the participation of three mathematics teachers and two grade III learners. According to findings obtained from the investigation, the teacher approaches such as the activation of prior knowledge, utilization of concrete media (multiplication board), scaffolding, guided practice, as well as transition from concrete objects to symbols, enable improvements in students' conceptual comprehension. After strategy implementation, students were able to understand the concept of representing multiplication in form of addition and division in terms of equal grouping, coupled with increased activeness in learning process.

Keywords: *teacher strategies, multiplication and division, elementary school mathematics*

Abstrak

Tujuan dari penelitian ini adalah mendeskripsikan strategi yang diterapkan oleh guru dalam upaya membantu siswa kelas 3 SD Muhammadiyah Terpadu Ponorogo agar dapat lebih memahami konsep tentang perkalian dan pembagian. Dalam penelitian ini, digunakan metode penelitian kualitatif deskriptif dengan teknik pengumpulan data berupa observasi, wawancara dan dokumentasi yang melibatkan tiga guru mata pelajaran Matematika dan dua siswa kelas 3. Temuan dari penelitian ini menunjukkan bahwa strategi yang digunakan oleh guru seperti strategi aktivasi pengetahuan awal, strategi penggunaan media konkret (papan perkalian), strategi scaffolding, strategi latihan terbimbing dan juga proses transfer secara bertahap dari materi konkret ke simbol dapat meningkatkan pemahaman konsep. Setelah penerapan strategi, siswa dapat merepresentasikan perkalian sebagai penjumlahan dan pembagian sebagai pengelompokkan yang sama serta peningkatan keterlibatan dan kepercayaan diri dalam pembelajaran. Penelitian ini menyimpulkan bahwa strategi guru yang terstruktur dan penggunaan media konkret efektif dalam memperkuat pemahaman konsep serta meningkatkan partisipasi siswa pada materi perkalian dan pembagian.

Kata kunci: strategi guru, perkalian dan pembagian, matematika sekolah dasar

INTRODUCTION

According to Law Number 20 of 2003 concerning the National Education System, education is a deliberate and systematically organized process aimed at creating and supporting a conducive learning environment (Johannis et al., 2024). Mathematics is an elementary subject that is very important in the development of students' logical, systematic,

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and critical thinking skills. In elementary schools, mathematics is not only important as a subject on its own but also as a foundation for learning other sciences that require numerical and analytical skills. A good understanding of basic mathematical concepts is important if students are to advance their learning to more complex levels in a sustainable manner. Understanding the basic mathematical concepts is often faced with different challenges (Kharismayanda et al., 2025).

This is not only attributed to the students' cognitive ability but also the lack of variety in the learning process without context or the use of learning media to aid the students' understanding of the subject matter. Moreover, the students' lack of understanding is also attributed to the lack of reinforcement of the students' knowledge through the use of different exercises and the application of mathematical problems in real-life situations. On the other hand, the different cognitive ability of the students presents another challenge to the students' learning. In a classroom setting, there are students who are fast learners, while there are those who may take time to understand the subject matter. However, this is not well addressed during the learning process, where the students may feel that they are lagging behind. Learning environment is another factor that influences the students' understanding of basic mathematical concepts. Most students do not get enough learning support at home regarding learning facilities or parental guidance (Kharismayanda et al., 2025).

The role of a teacher is a big factor in determining the quality of graduates produced by the world of education. If a teacher’s quality is high, it means that the quality of graduates produced by him/her is also high. If not, it will be less than optimal. It is clear that the quality of education is heavily dependent on the quality of its teacher. Law Number 14 of 2005 concerning Teachers and Lecturers states that "teachers are professional educators whose main duty is to educate, teach, guide, direct, train, assess, and evaluate students." It is clear that a teacher should be able to perform their duties well, especially in enhancing their students’ knowledge in a certain subject they are learning. One of the subjects taught to students in elementary school is mathematics (Maulida et al., 2025).

According to (Wahyuni et al., 2023), mathematics as a discipline has long been a tool to simplify everyday life. As a discipline, mathematics has been taught from Early Childhood Education through high school, and if someone wants to pursue advanced mathematics, they can do so after high school. Conceptual understanding is a thought process carried out by

someone to process the learning material they will receive into a meaningful way. Conceptual understanding is the most important aspect in learning mathematics. The ability to understand mathematical concepts is very important for students so they can learn mathematics well. This ability needs to be mastered by students from elementary school, because at this level they learn the basics of mathematics which are key to understanding mathematical material at the next level (Maulida et al., 2025).

Multiplication is a mathematical process involving the combination of numbers to get a result called the product, whereas division is a mathematical process of dividing a number into different equal parts (Unaenah et al., 2023). Multiplication and division are topics that require an understanding of basic mathematical concepts. Multiplication and division have been taught to students since elementary school, especially in the lower grades. Students often experience boredom when learning is solely teacher-centered. Teachers must be able to use their brains to provide understanding of the material in an interesting and meaningful way for students. The application of appropriate learning strategies is essential in the process of learning multiplication and division. A variety of learning strategies will make it easier for students to grasp and absorb the material presented by the teacher.

Therefore, it can be concluded that mathematics is a subject that is very important in developing students' logical, systematic, and critical thinking skills at elementary school levels. Understanding students' basic mathematics concepts is considered an important factor in students' success in learning other complex concepts, such as multiplication and division. In learning situations, it is found that students' understanding of their basic mathematics concepts faces different challenges not only in terms of internal factors, such as differences in students' cognitive ability, but also in terms of external factors, such as the lack of variety in learning strategies, the lack of using concrete media in learning, and the lack of learning environments at home.

METHODS

The research adopted a qualitative approach which involved the descriptive method of data collection using observation, interview, and documentation techniques. The study was carried out at SD Muhammadiyah Terpadu Ponorogo, where teachers and students at Grade 3 were used as key sources of information. The reason why the qualitative descriptive approach was adopted for this research is that this particular research sought to investigate

deeply into the efforts undertaken by the teachers in teaching their pupils about multiplication and division. This research process involved the following steps based on (Sugiyono, 2022) research framework.

The first step in the process entailed identifying issues that were related to the learning difficulties and the extent of understanding encountered by 28 third-graders while learning the mathematical concepts of multiplication and division. The second step entailed carrying out a literature review in order to come up with a theoretical framework as well as analysis of past studies on the topic of math learning strategies. In addition, a research design was made, which entailed identification of the sources of data, instruments, and implementation steps for the research. Data was collected using observation in class, interviewing the third-grade teachers and selected students as well as documentation in order to gain insights into the teacher strategies for teaching multiplication and division.

Data analysis used the interactive model of Miles, Huberman, and Saldana (Miles et al., 2014), this process includes such steps as data gathering, data condensing, data presentation, and making and validating conclusions. In this regard, data condensation included the choice of information that was concerned with teacher approaches, students' reactions, and learning outcomes. Data presentation was carried out using description in narrative form to make the main issues clear. The final step in this procedure consisted of interpreting and validating conclusions. Data validity was achieved by applying source and method triangulation, conducting member checks involving teachers and students to guarantee accurate data, and lengthening observation duration for more thorough data collection. All data collected through research are products of a thorough analysis carried out using this framework.

RESULTS AND DISCUSSION

RESULTS

The findings from this study have been derived by observing, interviewing, and documenting three mathematics teachers from the third grade of SD Muhammadiyah Terpadu Ponorogo. From the initial observation, the methods employed by the teacher for teaching multiplication and division have failed to motivate the participation of the pupils actively. This implies that there are several third graders who find it difficult to grasp the process involved in solving questions involving multiplication and division.

Implementation of Teacher Strategies During Multiplication and Division Lessons

The multiplication board was introduced in class after the instructor activated the students' prior knowledge on repeated addition and equal grouping in order to help them understand multiplication and division. The students managed to go up to the remembering and understanding levels in Bloom's Taxonomy due to the prior knowledge activation. Through the introduction of the multiplication board, numbers were now associated with concrete objects.

Figure 1. Multiplication Board Media

The multiplication and division processes were explained by the use of the multiplication board as a teaching medium. The clear instructions offered enhanced the learners' understanding of each process. Through demonstration, the teacher facilitated their movement from the concrete stage to the abstract representation. As a result, this approach helped them to move from the knowledge level to the application stage.

Guided practice was carried out to help students solve multiplication and division questions with the help of the teacher. This was done as the teacher walked around the class providing guidance whenever there were challenges faced by the students, particularly as far as making transitions from physical manipulations to abstract mathematics is concerned. With this kind of guidance, the students were able to analyze their own errors and understand number relations.

During the latter part of the lesson, the teacher ensured that chances would be provided to let the students work independently in order to determine their level of comprehension. The students were encouraged to evaluate their answers and propose alternative methods of arriving at solutions in the presence of the teacher. Through this activity, critical thinking was developed among the learners since they were able to reflect on their experiences and progress regarding the learned concepts.

Students' Learning Responses and Conceptual Understanding Development

The students were mostly engaged in the activities that involved the use of the multiplication board. They displayed a lot of enthusiasm while handling concrete materials and interacting with each other. The collaboration made them more motivated and confident in performing the multiplications and divisions. Hence, the whole class environment was lively.

Figure 2. Multiplication Board Media

From the interviews conducted, it became clear that the application of concrete media helped the learners easily visualize the arithmetic processes. Some students stated that it was only after the concept of multiplication had been represented through the use of tangible objects that they were able to appreciate its meaning. Nevertheless, there were some students who found it difficult to move from the concrete stage to the abstract one.

Those learners who had difficulties with division were greatly helped by the way in which the instructor explained things in detail. Through constant demonstration, they started seeing patterns and connections between multiplication and division. Students became better at tackling elementary abstract problems, suggesting that there was some

development in their level of understanding. It is clear how crucial continuous support is for improving understanding of multiplication and division.

Improvement of Students' Understanding with Concrete Evidence

It is quite clear that there is a significant improvement in the learners' ability to comprehend multiplication and division. In the beginning, the majority of the learners in the group comprising 28 learners from the third grade had difficulties in describing what is involved in multiplication and division. The learners used to memorize things without being able to understand the concept of multiplication and division. However, with many lessons involving the use of multiplication boards, 20 out of 28 learners were able to show multiplication and division.

This was also apparent in the way students worked out during classroom activities. At the beginning of the task, only seven students could multiply and divide numbers without any assistance. Upon doing guided activities using the multiplication board, 19 students were able to do the same task. From this observation, we can conclude that many students have already understood the process involved in multiplication and division operations.

Further proof was also derived from student worksheets used by all six third-grade classes, in which there was evident improvement. The students who used to give up on problems and make blind guesses learned how to solve tasks like "12 ÷ 3," giving logical explanation for their solutions through visual thinking with the use of the multiplication board. In addition, the interviews conducted confirmed that some of the students understood multiplication as "making groups bigger," while division was seen as "evenly splitting."

DISCUSSION

The results of this study reinforce the perspective of (Johannis et al., 2024) which states that elementary school students learn best through concrete experiences and direct interaction with learning materials. Since third-grade students are still operating within the concrete operational stage (Unaenah et al., 2023), the use of tangible learning tools is essential in helping them build meaningful understanding (Tandililing & Ruamba, 2025). In this study, teachers applied the multiplication board to support students in visualizing multiplication and division concepts (Sanjani, 2021). This approach aligns with the view of (Kharismayanda et al., 2025) that the effectiveness of learning strongly depends on the

suitability of the strategies and media selected by the teacher to meet students' developmental needs.

The implementation of teacher strategies in teaching multiplication and division also reflects the ideas proposed by (Manan & Nur Aidah, 2024), who emphasize that concrete mathematical media can strengthen students' thinking skills, improve problem-solving abilities, and foster positive attitudes toward mathematics. Using the multiplication board, students were able to physically manipulate objects, as well as visually represent number relations (Darisma Putri & Ulva, 2023). This finding also supports the research by (Aprilliyah et al., 2024), which highlights the importance of learning media in increasing motivation, participation, and student engagement so that learning objectives can be achieved more effectively.

The findings of this research are further aligned with the perspective of who argue that presenting mathematical concepts in concrete, realistic forms helps students transition to understanding abstract material (Johannis et al., 2024). This is consistent with current educational principles introduced by (M. Saleh & Akbar, 2024), which encourage student-centered, active, and meaningful learning experiences through hands-on activities. In the context of this study, the teacher's use of concrete media and guided practice supported students' development of critical thinking (Dariyah et al., 2026), problem-solving skills, and deeper conceptual understanding in multiplication and division (R. Saleh, 2025).

The application of these strategies produced positive changes in students' conceptual understanding (Hasiru et al., 2021). Observations and interviews showed that students became more active, confident, and enthusiastic when working with the multiplication board. This improvement is consistent with the findings of (Hasibuan et al., 2025), who conclude that game-based or concrete learning activities can reduce students' anxiety toward mathematics, increase motivation, and improve active participation. As a result, students in this study demonstrated stronger conceptual mastery, clearer reasoning, and more accurate problem-solving abilities in multiplication and division (Syakila et al., 2025).

Overall, the implementation of teacher strategies using the multiplication board contributed significantly to improving the quality of the learning process, learning outcomes, and student engagement in grade 3 mathematics. These results reinforce the perspective of (Manggus et al., 2023), who state that hands-on and student-centered learning experiences

help make mathematics more meaningful and enjoyable. Therefore, the multiplication board can be considered a practical and innovative learning medium that supports the achievement of mathematics learning objectives and enhances students' understanding of multiplication and division concepts in elementary schools.

CONCLUSION

The results of this research show that the instructional approaches employed when teaching multiplication and division concepts to Grade 3 learners at SD Muhammadiyah Terpadu Ponorogo had a positive impact on the conceptual knowledge of the learners. The employment of multiplication boards as manipulative learning materials enabled the learners to move from concrete experiences to abstract mathematical operations. Additionally, there was an observable improvement in learner participation, confidence, and motivation during the learning process. Previously, before employing such approaches, many learners were passive and lacked confidence; however, after the intervention, the majority of learners engaged actively in class activities. Moreover, many learners demonstrated multiplication using repeated addition and division using equal groupings.

In summary, these findings emphasize the significance of using manipulative objects and interactive teaching methods in elementary mathematics instruction. Not only does the application of these methods increase the students' comprehension, but it also creates a more stimulating and encouraging learning atmosphere. The research indicates that educators need to introduce the use of multiplication boards in their lesson plans to promote conceptual learning. This strategy can prove highly effective in teaching mathematics at an elementary level, as pupils require practical experience to learn concepts.

Future research could also focus on the application of these teaching techniques to other mathematical subjects or grades in order to determine their overall effectiveness. It is also important that educational institutions supply teachers with the necessary resources to use novel teaching approaches. Moreover, continuous assessment of teaching approaches can help to guarantee consistent improvements in student learning.

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