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Improving Students' Mathematics Learning Outcomes through Demonstration Methods in Geometry Materials

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Abstrak

Penelitian ini bertujuan untuk mengkaji upaya meningkatkan hasil belajar siswa melalui metode demonstrasi pada mata pelajaran matematika dengan materi banguan ruang berupa balok dan kubus siswa kelas IV MIN Medan Tembung. Adapun jenis penelitian ini menggunakan penelitian tindakan kelas (PTK), dengan subjek meliputi 37 siswa kelas IV MIN Medan Tembung. Hasil penelitian ini menyimpulkan bahwa penerapan metode demonstrasi dapat meningkatkan hasil belajar siswa kelas IV di MIN Tembung pada pelajaran matematika materi bangun ruang (kubus dan balok). Hal ini dibuktikan dengan hasil *pre-test* siswa yang semula rendah, yaitu 38,64 (bahkan tidak ada yang tuntas sesuai nilai Kriteria Ketuntasan Minimal/KKM). Hasil tes akhir pada siklus I yang belum menggunakan metode demonstrasi (masih metode konvensional) menunjukkan peningkatan, di mana 7 siswa telah mencapai nilai KKM (18,9%) sedangkan 30 siswa lainnya belum mencapai KKM (81,1%). Selanjutnya, hasil tes akhir pada siklus II yang telah menggunakan metode demonstrasi menunjukkan peningkatan signifikan, di mana terdapat 32 siswa (86,48%) yang memenuhi KKM dan 5 siswa (13,52%) yang belum mencapai KKM.
Kata Kunci: Hasil Belajar, Metode Demonstrasi, Pembelajaran Matematika.

Abstract

This study aims to examine efforts to improve student learning outcomes through demonstration methods in mathematics subjects with building materials in the form of blocks and cubes for fourth-grade students of MIN Medan Tembung. This type of research uses classroom action research (CAR), with subjects covering 37 fourth-grade students at MIN Medan Tembung. The results of this study conclude that the application of the demonstration method can improve the learning outcomes of fourth-grade students at MIN Tembung in mathematics lessons on building materials (cubes and blocks). This is evidenced by the results of the student's pre-test which was originally low, namely 38.64 (none even completed according to the Minimum Completeness Criteria/KKM). The results of the final test in the first cycle that did not use the demonstration method (still conventional method) showed an increase, where 7 students had achieved the KKM score (18.9%) while the other 30 students had not reached the KKM (81.1%). Furthermore, the results of the final test in the second cycle that used the demonstration method showed a significant increase, where there were 32 students (86.48%) who met the KKM and 5 students (13.52%) who had not reached the KKM.
Keywords: *Learning Outcomes, Demonstration Methods, Mathematics Learning.*

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INTRODUCTION

Learning mathematics is one of the basic materials that must be studied at the SD/MI equivalent level (Rahayu, 2013: 1-5). This is intended to train children's logical thinking and hone higher-order thinking skills from an elementary age (Mulyani & Halidjah, 2013). Furthermore, children will be given mathematics lessons at the junior high school (SMP equivalent), high school (SMA), and college level (in certain study programs). Usually, every material in mathematics is seen as something scary and difficult for students (Lailiyah & Setyawan, 2022: 714-718).

Children's concerns about taking math lessons seem to be contagious from time to time. Mathematics is a subject that is close to children's daily lives, namely numbers. According to Zuliatin (2021), mathematics subjects are considered difficult by children because they have to be observant in memorizing formulas and derivatives of numbers in the process of addition, subtraction, division, or multiplication. In addition, Sari & Sari (2021: 12-18) added that mathematics is considered difficult by children because many questions are story-based. These obstacles are always a form of obstacles in learning mathematics.

According to Sukerti (2021: 232-238), the frame of learning mathematics is considered difficult by children, not entirely due to the fear and reluctance of children to learn mathematics. This can also be caused by conventional teacher teaching strategies or methods so that children feel bored. Furthermore, Helminaria (2018: 908-921) explains that the anxiety of children learning mathematics is influenced by the teaching process carried out by the teacher in the classroom. For this reason, it takes creativity from mathematics teachers to present learning more effectively and in fun.

Creativity in teaching mathematics can be done by the teacher through the setting or arrangement of the classroom (Murdiana, *et.al.*, 2020: 152-160). In addition, teachers can also apply various models, methods, and active learning strategies, as a form of stimulus for students' active participation in learning. The teacher's efforts in creating an active and conducive learning atmosphere provide space for students to be actively involved and add to the learning experience, especially mathematics material. Supardi (2015) suggests making various forms of innovation so that students do not feel bored learning mathematics.

In practice, Tanjung (2018) in his research explains that various innovations can be given to children in learning mathematics, including using snakes and ladders media or crossword puzzles. Siswono (2016: 11-26) continues that mathematical formulas that are often considered difficult by children should be made with unique abbreviations and are close to daily activities so that children can easily memorize the formulas. Sholeh & Fahrurozi (2021) termed this effort as a combination of games and learning, where children still have the right to learn and are close to the world of play.

Elementary children at the SD/MI level have a world of play, where all children's activities are always directed at games, even learning is considered a game. Responding to the phase of the child's age development, Setiawan (2020: 12-21) explained that the learning given to children should not separate the world of children's play, including learning mathematics. Thus, the term edutainment was born as a combination of learning while playing and playing while learning for children.

Learning mathematics, which is seen as difficult and boring for children, should be reframed with a description that mathematics is a subject whose material is very close to children's daily lives and can become a provision to train children's thinking skills (Fajriyah, 2021). On this basis, the right method is needed to help change the mindset or mindset of children about math lessons.

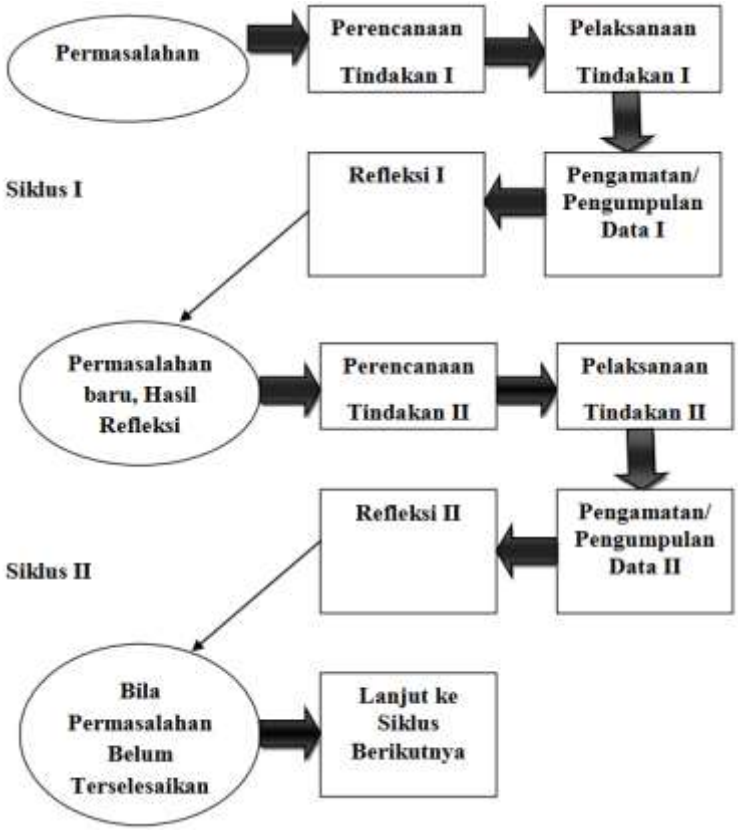
According to Widiyanto & Yunianta (2021: 425-436), the demonstration method is one of the effective methods used in learning. This is because children at the cognitive stage of concrete thinking need various media that can be captured by the senses of sight and audible (audio-visual) and can be demonstrated (kinesthetic). Elementary children in grade IV at MIN Medan Tembung are suitable for teaching mathematics using the demonstration method. In addition to concrete, demonstration methods can also help teachers animate an active atmosphere in the classroom so that students are actively involved (proactive) during the learning process.

Relevant research on improving students' mathematics learning outcomes and demonstration methods have been extensively studied separately by previous researchers. Among them are discussing aspects of student learning activities (Nugraha, 2021: 12-21), the use of number line bridge visual aids (Arifuddin & Arrosyid, 2017: 165-178), stick media pieces (Toruan, 2021: 247-252), the use of simple props on the weight unit ladder (Putra & Clara, 2020: 568-575), the material on fractions of money values (Marwatan, 2022: 437-447), problem-based learning models (Suardana, 2019: 270-277), mixed arithmetic operations (Magnatis, 2019: 20-28; Aprinawati, 2017: 54-67), efforts to improve student achievement (Sariningtyas, 2019: 40-47), and studies on the subject of symmetry (Astuti, 2018).

Observing the description above, there is a gap analysis between this research and the previous one, namely from research material in the form of cubes and blocks, as well as through classroom action research to test how much the implementation of the demonstration method in improving mathematics learning outcomes for fourth-grade students at MIN Medan Tembung, which is summarized in the title of the research, "*Efforts to Improve Student Learning Outcomes Through Demonstration Methods in Mathematics Lessons on Building Materials*". Through this research, it is hoped that it can become a scientific treasure in the application of the demonstration method as an effort to improve mathematics learning outcomes for elementary-age students.

METHOD

This study uses classroom action research (CAR) to reveal and improve the process and learning outcomes of students in the classroom. The subjects of this study consisted of 37 students of class IV MIN Medan Tembung, with details of 19 male students and 18 female students. The research was carried out from February to April 2022, carried out in 2 cycles with 4 stages in each cycle, namely planning, implementation, observation, data collection, and reflection (Assingkily, 2021). The data in this study were declared valid after the researchers attempted to use triangulation techniques to measure the degree of trustworthiness, transferability, dependence, and confirmability. Further, the following is the research scheme:



Picture 1. Flow of Research Framework (CAR).

FINDINGS AND DISCUSSION

This research was carried out in 2 cycles by applying the demonstration method to improve the mathematics learning outcomes of fourth-grade students at MIN Medan Tembung on the material of cubes and blocks. It is further described below:

Cycle I (First)

Learning methods have an important role for teachers to streamline the learning atmosphere in the classroom. This study uses the demonstration method as an effort to improve the learning outcomes of fourth-grade students at MIN Medan Tembung in the mathematics subject of cubes and blocks. The description below discusses the first cycle with 4 (four) stages, namely planning, implementation, observation, and reflection.

1. Action Planning in Cycle I

Before the planning stage, the researcher first identified the learning problems experienced by students in mathematics, especially the cube and block building materials. After finding the results of the pre-test, the researchers prepared a learning implementation plan (RPP) that contained the procedures and processes of learning activities for the first cycle. Then, prepared to learn facilities that support the implementation of the learning process (eg student textbooks). Next, the researcher made a student observation sheet. This is intended to monitor or observe the condition of students and the state of learning activities in the classroom during the mathematics learning process (grade IV MIN Medan Tembung).

According to Fanani, *et.al.* (2020: 33-37), planning in classroom action research is needed by researchers. In addition to being used as the basis and "compass" or direction of research objectives, planning is also the basis for improving education through classes. Waluyo & Sukatiman (2021: 359-380) added that efforts to improve education from the existing classroom in the classroom action research process include observation guidelines, learning implementation guidelines, and preparing the necessary facilities during the learning process.

Based on the description above, it can be understood that the action planning in the first cycle is urgent as a guide for implementation and observation. The planning stage starts from problem identification and pre-test of students' mathematics learning outcomes using conventional methods to review the extent to which student learning outcomes are achieved based on minimum completeness criteria (KKM). After obtaining the results of the pre-test, the researchers then compiled lesson plans and observation sheets and prepared to teach aids or learning facilities needed in improving the class.

2. Implementation of Actions in Cycle I

An implementation stage is a form of realization of the previous design. Where, the entire process is carried out by following the lesson plans in learning, carrying out observation actions according to the observation sheets that have been prepared at the planning stage, and using learning facilities that have been previously identified according to research needs. The material that is focused on in this research is mathematics lessons about the material of building cubes and blocks, using the demonstration method.

Based on the description above, it can be understood that the action planning in the first cycle is urgent as a guide for implementation and observation. The planning stage starts from problem identification and pre-test of students' mathematics learning outcomes using conventional methods to review the extent to which student learning outcomes are achieved based on minimum completeness criteria (KKM). After obtaining the results of the pre-test, the researchers then compiled the lesson plans and observation sheets and prepared the teaching aids or learning facilities needed in improving the class.

The activities at the action implementation stage were carried out in 3 meetings, with an allocation of 2x30 minutes. Where, each meeting is divided into 3 (three) activities, namely initial activities, core activities, and final activities (closing). At each meeting (starting from meetings I-III) the researchers consistently carried out the same activities. In the initial activity, the researcher as well as the teacher started the lesson by saying

greetings (*Assalamualaikum wr.wb.*), checking student attendance, giving apperception to students, and explaining the material and learning objectives.

Furthermore, the main activity was carried out by the researcher as well as the teacher by explaining the material for building cubes and blocks and asking students directly about their understanding of cubes and blocks with objects around students. Then, the teacher forms small groups, explains the steps of group work, instructs students to make examples of cubes or blocks from the learning tools that have been prepared, and dares to present their work in front of the class.

In the next step, the teacher gives questions to students, provides opportunities for students to ask questions, and appreciates student performance (rewards). Finally, in the core activity, the teacher motivates students and questions students' impressions of learning. At the final or closing activity stage, the researcher, as well as the teachers, give reflection to students on the learning activities that have been carried out, asking students to conclude the travel material according to students' understanding. Then, the teacher and students pray together, and finally, the teacher greets the students.

3. Observation and Reflection in Cycle I

At this stage, the observations were made by the mathematics teacher who was deliberately chosen by the researcher. This observation task was carried out to see the skills of researchers in teaching and to see student learning activities. This is intended to obtain objective learning outcomes qualitatively and quantitatively. The learning outcomes obtained in the first cycle become a reflection for the next action (Cycle II). The student learning outcomes have increased learning outcomes in learning mathematics with the material of building cubes and blocks, which is 66.48%. Likewise, the results are not optimal because students who achieve the KKM score are 7 students.

Cycle II (Second)

The process in the second cycle is the same as the previous cycle (cycle I), namely through 4 (four) stages, including planning, implementation, observation, and reflection. The results of the final test in the first cycle that did not use the demonstration method (still conventional method) showed an increase, where 7 students had achieved the KKM score (18.9%) while the other 30 students had not reached the KKM (81.1%). Furthermore, the results of the final test in the second cycle that used the demonstration method showed a significant increase, where there were 32 students (86.48%) who met the KKM and 5 students (13.52%) who had not reached the KKM.

Based on the average results in the initial test (pre-test) cycle I, it can be seen that from 37 students, none of them are included in the complete learning category, meaning 37 students (100%) are not included in the complete learning category. The overall average score of students on this test was 38.64% less than 85. Then the researchers carried out the teaching and learning process which was carried out in the classroom. At the end of the study, the researcher gave a final test (post-test), from the results of the test only 7 students completed learning (18.9%), and 30 students were not included in the category of complete learning (81.1%). The average value obtained by students is 66.48% <85%. It can be seen in table 4.6 above. This means that in the first cycle, the average value obtained by students has not reached the predetermined KKM value.

Furthermore, based on the results of the first cycle, the researchers continued the learning process in the second cycle which aims to improve student learning outcomes in this mathematics subject, learning in the second cycle only focuses on learning that students do not understand the material in cycle I. After the researchers carry out the activities of the teaching and learning process, the researcher gave a final test to determine student learning outcomes. It can be seen that students who are included in the complete learning category are 32 students (86.48%), this value > 85%, meaning that they have reached the value expected by the teacher. And students who are not included in the complete learning category there are 5 students (13.51%) meaning <85% have not reached the KKM value. The overall average score of students reached 88.64% and reached the KKM score. From the

final results of students obtained a value of 88.64% researchers no longer continue the learning process in the next cycle because the value achieved by students has reached the KKM score.

Furthermore, a description of these findings is presented in the following table:

Table 1
Research Results Since Pre-test to Cycle II

Stage	Minimum Completeness Criteria (KKM)		Achievement results KKM
	Complete	Not Complete	
Pre-Test	0	37	0%
Cycle I	7	30	18,9%
Cycle II	32	5	86,48%

Observing the table above, it is clear that learning using the demonstration method helps students to be actively involved in the mathematics learning process. This is in line with what was stated by Syahputri (2018), that learning mathematics which is seen as boring must be packaged with the help of methods in presenting the material. Arjanggi, *et.al.* (2013) added that the demonstration method is able to accommodate students' learning styles that tend to be audio-visual or visual in the classroom so that it has an impact on improving student learning outcomes.

Thus, it can be understood that mathematics learning has a fun interactive space during the learning process. Of course, this is directly proportional to the teaching creativity practiced by the teacher, especially in the use of learning methods that are in accordance with the teaching materials. In this context, it is proven that the demonstration method used by mathematics teachers in building cubes and blocks can improve the mathematics learning outcomes of fourth-grade students at MIN Medan Tembung.

CONCLUSION

Based on the results of the description and discussion above, it was concluded that the application of the demonstration method can improve the learning outcomes of fourth-grade students at MIN Tembung in mathematics lessons on building materials (cubes and blocks). This is evidenced by the results of the student's pre-test which was originally low, namely 38.64 (none even completed according to the Minimum Completeness Criteria/KKM). The results of the final test in the first cycle that did not use the demonstration method (still conventional method) showed an increase, where 7 students had achieved the KKM score (18.9%) while the other 30 students had not reached the KKM (81.1%). Furthermore, the results of the final test in the second cycle that used the demonstration method showed a significant increase, where there were 32 students (86.48%) who met the KKM and 5 students (13.52%) who had not reached the KKM.

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