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DISCOVERY LEARNING WITH SMART MULTIPLICATION BOARD MEDIA TO IMPROVE MATHEMATICS LEARNING OUTCOMES IN GRADE III ELEMENTARY STUDENTS

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Abstract: Mathematics learning outcomes of elementary students are often still low due to the use of less interactive learning models and limited instructional media. Therefore, innovative learning approaches are needed to support students' understanding, especially at the lower grade ***level.*** *This study aims to determine whether the Discovery Learning model supported by Smart Multiplication Board media can improve mathematics learning outcomes of third-grade elementary school students. The study was conducted at SDN 46 Lubuklinggau. This research employed Classroom Action Research (CAR) involving 21 third-grade students, consisting of 11 males and 10 females. The Discovery Learning model was implemented through two cycles, each consisting of planning, action, observation, and reflection stages. Data were collected using tests, observations, and documentation, and analyzed using descriptive qualitative and descriptive quantitative techniques. The results showed an improvement in students' mathematics learning outcomes after the implementation of the Discovery Learning model with Smart Multiplication Board media. In Cycle I, the average pre-test score was 55.95 and increased to 60 in the post-test. In Cycle II, the average pre-test score increased to 67.14 and further improved to 72.38 in the post-test. These findings indicate a consistent improvement in students' learning outcomes across cycles. It can be concluded that the Discovery Learning model supported by Smart Multiplication Board media is effective and can be used as an alternative learning model to improve mathematics learning outcomes for third-grade elementary students. The findings of this study imply that teachers are encouraged to integrate discovery-based learning models with concrete and interactive media in mathematics instruction. Future research is recommended to apply this model at different grade levels or subjects and to examine* its long-term impact on students' conceptual understanding and learning motivation.
Keywords: ***learning outcomes, mathematics, Discovery Learning, Smart Multiplication Board***.

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INTRODUCTION

Education plays a crucial role in shaping individuals' attitudes, behaviors, and competencies to support lifelong development. According to Wahab et al. (2022), education is an effort to develop human personality both spiritually and physically, while Ahdar (2021) emphasizes education as a lifelong process that occurs in all learning environments. In Indonesia, education is regulated by Law No. 20 of 2003, which states that education is a conscious and planned effort to create a learning atmosphere that enables students to actively develop their potential, including intelligence, personality, and skills. Elementary school education serves as a fundamental stage in building students' basic knowledge and skills that will support their future learning (Aka, 2016). Therefore, learning implementation at the elementary level must be carried out optimally, particularly in mathematics education.

Mathematics is one of the core subjects in elementary school and plays an important role in developing logical thinking, problem-solving skills, and numerical understanding. However, mathematics learning in elementary schools often faces challenges related to students' low engagement and limited conceptual understanding, especially when learning is dominated by teacher-centered approaches.

Previous studies have highlighted the effectiveness of the Discovery Learning model in improving students' understanding of concepts. Josephine et al. (2016) explain that discovery learning emphasizes students' active involvement in discovering concepts independently, thus reducing verbal and rote learning. Kristin (2016) further states that discovery learning encourages students to observe, experiment, and draw conclusions through scientific activities, making learning more meaningful and student-centered. These studies indicate that discovery learning can positively influence students' cognitive development and learning outcomes.

Despite the proven effectiveness of the Discovery Learning model, previous research has mostly focused on its general implementation without integrating concrete and interactive learning media, particularly for lower-grade elementary students who require visual and manipulative learning tools. This condition indicates a research gap regarding the integration of discovery learning with specific instructional media to support mathematics learning at the elementary level.

Based on observations and interviews conducted on May 10, 2025, with a third-grade teacher at SD Negeri 46 Lubuklinggau, it was found that students tended to be passive during

mathematics lessons. Many students did not pay attention to the teacher's explanations and were often engaged in chatting with peers. The teacher predominantly used textbooks and lecture-based methods, resulting in decreased student engagement and learning outcomes. Of the 21 students, only 11 achieved scores above the Minimum Completion Criteria (KKM) of 70, while 10 students did not meet the required standard.

Therefore, the research problem of this study is how to improve mathematics learning outcomes of third-grade elementary students through an innovative learning model supported by appropriate instructional media.

This study offers a solution by implementing the Discovery Learning model integrated with Smart Multiplication Board media, which is designed to support students' active discovery and conceptual understanding of multiplication.The novelty of this research lies in the integration of Discovery Learning with Smart Multiplication Board media in mathematics instruction for third-grade elementary students under the Merdeka Curriculum context.

This research is significant as it provides practical implications for teachers in designing more interactive and student-centered mathematics learning, as well as theoretical contributions to the development of discovery-based learning models supported by concrete instructional media.

METODOLOGI

Research Design

This study used the Classroom Action Research (CAR) method. According to Arikunto et al. (2020:3), Classroom Action Research (CAR) is an effort to observe student activities carried out by teachers to determine whether there is an improvement in student outcomes after the action is taken. Students undergo a series of teacher-guided learning activities during class. The teacher will provide learning activities for students to achieve significant improvements in learning outcomes.

Rubiyati et al. (2022:285) explain that each cycle will be implemented through four stages: planning, implementation, observation, and reflection.

Research Subject

The research was conducted at Lubuklinggau Public Elementary School 46, located on Jl. Majapahit, Lubuklinggau Tinur I District, Lubuk Linggau City, South Sumatra Province. The research will be conducted in fourth-grade students during the even semester of 2025.,

Data Collecting

Data collection techniques are methods used by researchers to gather information from sources they have obtained. According to Millah (2023:145), data collection techniques are methods researchers use to record the required information. The following are data collection techniques used by researchers:

Observation Hasibuan (2023:9) explains that observation is a direct observation aimed at collecting data by recording the conditions experienced by the subject during the research. In this case, an observation sheet is useful for recording the activities and actions taken by teachers and students during the learning process. It consists of two objects to be observed: the teacher and the student. The observation sheets used are a teacher activity observation sheet and a student activity observation sheet, each of which will be filled out or recorded by the observing teacher.

Interview Sugiyono (2021:195) explains that an interview is a data collection technique that involves asking a number of questions to respondents. The questions are asked to obtain various information needed by the researcher. Questions will include the learning model used by the teacher during teaching, the media used by the teacher, and students' responses to the material presented by the teacher.

Test Gumantan (2020:198) explains that a test is a data collection tool in the form of questions to determine student performance after completing the learning process. The test given relates to the material presented to students during the learning process. The test used in this study consisted of 10 questions per cycle. The questions were created based on the lesson material indicators.

Documentation Ardiansyah (2023:3) explains that documentation is a tool for collecting data in the form of photographs/images during research. Photos will be attached as notes and evidence to confirm that the researcher actually conducted the research.

Data Analysis

Jariah et al. (2023:76) explain that data analysis techniques are the process of searching for, discussing, and processing information. Data analysis techniques aim to organize data obtained from research results. The data analysis techniques used in this study are:

1) Learning Outcome Analysis

a. Average Score Analysis

To determine the average student score, use the following formula according to Supardi (2016:58):

$$Mx = \frac{\sum x}{N}$$

Where:

Mx = Mean

∑x = Total student scores

N = Number of students.

b. Analysis of Student Learning Outcome Completion

The data analysis technique used to analyze student learning outcomes uses the average score with the following formula:

$$P = \frac{F \times 100}{N}$$

Where:
P = Percentage sought
F = Frequency
N = Total number
100% = Fixed number

Data analysis is a method used to manage data that correlates with the stated problem formulation so that it can be used to draw conclusions. This research technique utilizes quantitative analysis, namely analysis that utilizes quantitative analysis tools, which utilize mathematical, statistical, and ecomotor models. Sarah S.N (2021), Learning completion formula:

$$KB = \frac{T}{Tt} \times 100$$

KB: Learning Completion
T: Total score obtained by students.
Tt: Number of students multiplied by 100.

RESEARCH RESULT

The research and data collection took place at SD Negeri 46 Lubuklinggau for third-grade students from May 10, 2025, to May 28, 2025. The learning model used was Discovery Learning, using a multiplication smartboard for the mathematics subject of multiplication.

The research began with direct observation at SD Negeri 46 Lubuklinggau to directly observe the students' classroom conditions and consult with the third-grade teacher to discuss their learning needs before conducting the research. The researcher then prepared data collection instruments in the form of teacher activity observation sheets, student activity observation sheets, evaluation questions from Cycles I to II, the Independent Curriculum Teaching Module, learning media, and teaching materials.

In conducting the research at SD Negeri 46 Lubuklinggau, the researcher conducted two cycles to obtain research data, with each cycle consisting of four stages: planning, implementation, observation, and reflection. During the learning process, Mrs. Ruspita, S. Pd, as the observing teacher, filled out the observation sheets for teacher and student activities. During the research, the researcher acted as the teacher, going through the various stages that had been prepared.

Discussion

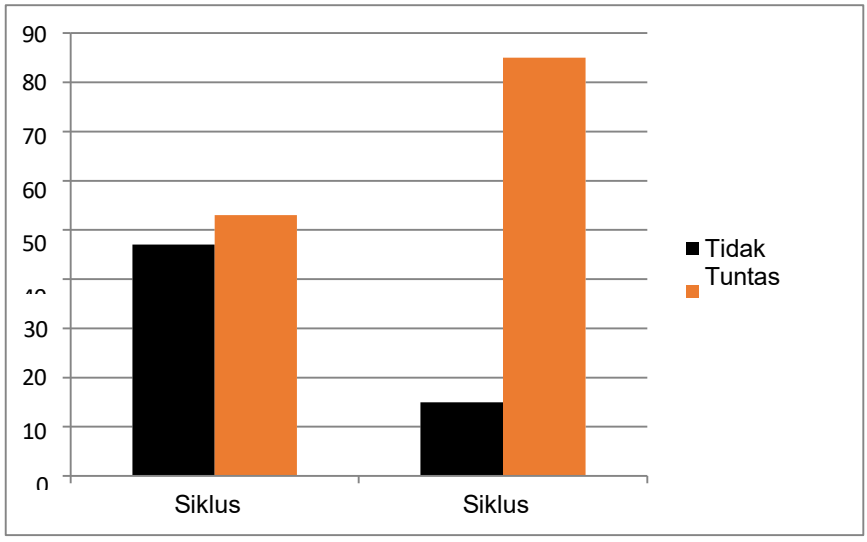

Figure 4.4 Diagram of Student Learning Outcomes in the Learning Process

Figure 4.4 shows student learning outcomes over two cycles. In the first cycle, 10 students achieved a score of 70 and 11 students failed. In the second cycle, 18 students achieved a score of 70 and 3 students failed.

Therefore, student learning outcomes improved after the second cycle, implementing the Discovery Learning model with a multiplication smartboard as learning media.

CONCLUSION

Based on the results of a study on the implementation of the Discovery Learning model using multiplication smartboards to improve mathematics learning outcomes for third-grade students at SD Negeri 46 Lubuklinggau, with 21 students as subjects, the following conclusions can be drawn:

a. Teacher activity during the learning process using the Discovery Learning model using multiplication smartboards in the mathematics subject of speed. Teacher activity during the first cycle was 76%, increasing to 96% in the second cycle.

b. The percentage of student activity observed in the first cycle was 57%, increasing to 88% in the second cycle.

c. Third-grade students' mathematics learning outcomes after implementing the Discovery Learning model using multiplication smartboards in the first cycle were 47%, categorized as poor, and increased to 85% in the second cycle, categorized as good.

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