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IMPROVING MATHEMATICS LEARNING OUTCOMES WITH CTL ASSISTED BY BEADS MEDIA

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Abstract: Background: Low mathematics learning outcomes and students' difficulties in understanding abstract concepts remain a common problem in elementary schools. Conventional teaching methods often fail to connect mathematical content with students' real-life experiences, resulting in low engagement and achievement. Therefore, innovative learning models and concrete media are needed to improve students' conceptual understanding. This study aims to determine whether the Contextual Teaching and Learning (CTL) model assisted by beads media can improve mathematics learning outcomes of fifth-grade elementary school students. This study employed Classroom Action Research (CAR) involving 20 fifth-grade students of SD Negeri 46 Lubuklinggau. Data were collected through observation, documentation, and achievement tests, and analyzed using descriptive quantitative techniques. The research was conducted in two cycles, each consisting of planning, action, observation, and reflection stages. In Cycle I, the pre-test results showed 15% of students in the very low category, while post-test results increased to 75% in the moderate category. In the second meeting of Cycle I, student achievement reached 30%. In Cycle II, the pre-test results increased to 40% (low category), and the post-test results significantly improved to 85% in the very high category. These findings indicate a substantial improvement in students' mathematics learning outcomes after the implementation of CTL assisted by beads media.The application of the CTL model assisted by beads media effectively improves elementary students' mathematics learning outcomes and conceptual understanding. study recommends the use of CTL combined with concrete learning media in mathematics instruction and suggests further research involving larger samples and different mathematical topics.
Keywords: Learning outcomes, Mathematics, Contextual Teaching and Learning

INTRODUCTION

In the learning process itself, students obtain learning outcomes, which can vary depending on their level of understanding and ability. According to Lubis and Irsan (2024:8285), learning outcomes are changes in student behavior that occur after participating in learning.

These modifications encompass various dimensions, namely cognitive (consisting of remembering, understanding, applying, analyzing, and evaluating), affective (including acceptance, participation, evaluation, and organization), and psychomotor (including awareness, preparation, guided movement, habitual movement, and complex movement). The results of these modifications are quantitatively represented through numerical values or grades. These learning outcomes allow us to assess student development. In an educational context, learning outcomes serve as indicators of students' level of understanding and proficiency during the learning process. Learning outcomes can be a measure of achievement in learning. Learning outcomes are a fundamental component in the instructional and educational process. Based on the results of observations conducted at SD Negeri 46 Lubuklinggau in grade V students, the mathematics learning outcomes obtained by students through the learning process in class are still below the Minimum Completion Criteria (KKM), which is 70. This can occur because students lack speaking skills, to answer questions from the teacher, students only answer when appointed. Only one or two students answer, and even then it is the same student. Students often refuse when asked to come to the front to work on problems given by the teacher on the board. This happens because students lack practice in counting and also lack courage. Students also rarely ask the teacher when there is something they do not understand in the learning process in class. In addition, students are also lacking in solving a problem on the questions given by the teacher.

Therefore, to address these issues, teachers need to use appropriate learning models to motivate students to actively participate in the learning process, especially in mathematics. Therefore, to improve the mathematics learning outcomes of fifth-grade students at SD Negeri 46 Lubuklinggau, the teacher used the Contextual Teaching and Learning Model. Based on the above background, the researcher attempted to conduct classroom action research on "Improving Mathematics Learning Outcomes Through the Contextual Teaching and Learning Model Assisted by Beads Media for Fifth-Grade Elementary School Students."

METODOLOGI

The type of research used in this study is Participatory Classroom Action Research (CAR). A study is considered Participatory Classroom Action Research (CAR) if the person conducting the research is directly involved in the research process from the beginning to the end. According to Sanjaya (2016:11), Classroom Action Research (CAR) is one effort teachers can

make to improve the quality of their roles and responsibilities, particularly in managing learning.

Research Subject

So the subjects in this study were all fifth grade students of SD Negeri 46 Lubuklinggau, totaling 20 students consisting of 12 boys and 8 girls.

Data Collecting

According to Sugiyono (2015: 204), observation is the activity of recording research on an object. When viewed from the data collection process, observation is divided into participant and non-participant. The type of observation used in this study is non-participant observation. In conducting observations, researchers select things to observe and record things related to the research.

Sugiyono (2021:195) explains that interviews are a data collection technique that involves asking respondents a series of questions. These questions are intended to uncover the various information needed by the researcher. These questions include the learning model used by the teacher, the media used by the teacher, and student responses to the material presented by the teacher.

Gumantan et al. (2020:198) explain that tests are data collection tools in the form of questions to determine student performance after completing the learning process. The tests given relate to the material presented to students during the learning process. The tests used in this study consisted of five essay questions for each cycle. The questions were designed based on lesson material indicators.

According to Sugiyono (2015: 329), documentation is a method used to obtain data and information in the form of books, archives, documents, written figures, and images, in the form of reports and explanations that can support research. Documentation is used to collect data and then analyze it. The documentation used in this research includes the syllabus, lesson plans, and mid-term exam scores.

Data Analysis

Learning Outcome Analysis

This learning analysis is used to determine whether there is a comparison between learning outcomes before and after using the Contextual Teaching and Learning model.

$$X = \frac{}{n}$$

Description:

X : Mean (average)

Xi : Total number of data n — Number of data

Analysis of Student Learning Outcomes

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

$$P = \frac{}{} x\ 100\%$$

Description:

:The percentage number sought

:Frequency

N : Total 100% — Fixed number

Classical Completion Analysis

A data analysis technique used to calculate the level of completion of each student's learning outcomes and the percentage of student learning completion classically.

Teacher Activity Data Analysis

Teacher activity data was obtained through teacher activity observation sheets. The data was obtained through analysis using the average and percentage formulas, as follows:

$$P = —x\ 100\%$$

Description:

The percentage number sought

= Frequency

N = Total number

100% — Fixed number

Student Activity Data Analysis

Student activity data was obtained through student activity observation sheets. Student activity data was obtained through analysis using the average and percentage formulas, as follows:

$$P = —x\ 100\%$$

Description:

The percentage number sought

= Frequency

N = Total number

100% — Fixed number

RESEARCH RESULT

Finding

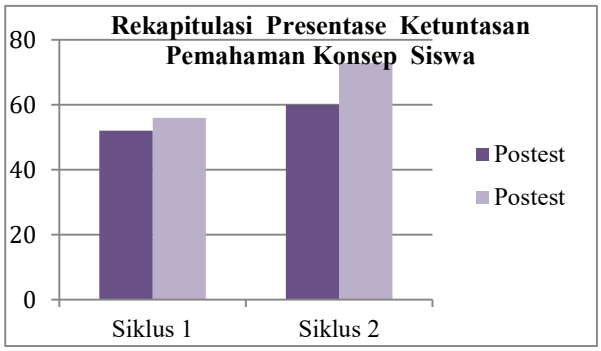
is an analysis of student learning outcomes in pre-experiment I, student mathematics learning outcomes in pre-experiment I. The assessment was carried out in accordance with or following the assessment guidelines in the question grid and lesson plans. The KKM value for fifth-grade mathematics at SD Negeri 46 Lubuklinggau is 70. In pre-experiment I, there were 3 students who completed the course with a percentage of 15% and 17 students who did not complete it with a percentage of 75%. There were more students who did not complete the

course than those who completed it. Therefore, the researcher continued improvements in the first pre-experiment meeting 2.

is an analysis of student learning outcomes in cycle I, student mathematics learning outcomes in cycle I. The assessment was carried out in accordance with or following the assessment guidelines in the question grid and lesson plans. The KKM score for fourth-grade mathematics at SD Negeri 46 Lubuklinggau is 70. In cycle I, there were 6 students who completed the course with a percentage of 30% and 14 students who did not complete the course with a percentage of 70%. There were more students who did not complete the course than those who completed it. Therefore, the researcher continued the improvement in cycle 2, meeting 3.

is an analysis of student learning outcomes in cycle II, student mathematics learning outcomes in cycle II have increased from the previous cycle. The assessment is carried out in accordance with or following the assessment guidelines that have been prepared in the question grid and lesson plans. The KKM value for fifth grade mathematics at SD Negeri 46 Lubuklinggau is 70. In cycle II, there were 10 students who completed the test with a percentage of 50% and there were 10 students who did not complete the test with a percentage of 50%. There were more students who did not complete the test than those who completed the test. Therefore, the researcher continued the improvement in cycle II, meeting 4.

is an analysis of student learning outcomes in cycle II, student mathematics learning outcomes in cycle II experienced an increase from the previous cycle. The assessment was carried out in accordance with or following the assessment guidelines that have been prepared in the question grid and lesson plans. The KKM value for fifth grade mathematics at SD Negeri 46 Lubuklinggau is 70. In cycle II, there were 17 students who completed the course with a percentage of 85% and there were 3 students who did not complete it with a percentage of 15%. There were more students who did not complete the course than students who completed it.



Discussion

The findings presented in Figure 4.12 demonstrate a clear improvement in student learning outcomes across two cycles through the implementation of the Contextual Teaching and Learning (CTL) model. In Cycle I, student learning completeness was still relatively low. During Meeting 1, only 3 out of 20 students achieved completion with an average score of 52, while 17 students did not meet the minimum mastery criteria. Although there was a slight improvement in Meeting 2 of Cycle I, with 6 students completing the test at an average score of 56, the majority of students (14 learners) still failed to achieve mastery. These results indicate that students were still in the process of adapting to the CTL approach and had not yet fully benefited from its learning principles.

However, a significant improvement was observed in Cycle II. In the first meeting of Cycle II, 10 students achieved mastery with a score of 60, showing a substantial increase compared to Cycle I. This improvement suggests that students began to understand mathematical concepts more effectively as they engaged in contextual activities that linked learning materials to real-life situations. By the second meeting of Cycle II, learning completeness increased dramatically, with 17 students achieving mastery at an average score of 73.5, while only 3 students remained incomplete. This finding confirms that repeated implementation of CTL can gradually enhance students' conceptual understanding and academic performance.

These results are consistent with the views of contemporary educational experts. According to Susanti and Prasetyo (2021), CTL is effective in improving learning outcomes because it emphasizes meaningful learning by connecting academic content with students' daily experiences. When students are able to relate abstract mathematical concepts to concrete contexts, they develop deeper understanding and retain knowledge more effectively. Similarly, a study by Hidayat et al. (2022) found that contextual learning models significantly increase student engagement and mastery, particularly in mathematics, which is often perceived as difficult and abstract by elementary school students.

Furthermore, the improvement in learning completeness aligns with the findings of Rahmawati and Nugroho (2023), who argue that CTL supports active learning by encouraging students to participate, explore, and reflect on their learning experiences. This active involvement helps reduce learning anxiety and increases students' confidence in solving mathematical problems. The gradual increase in completion rates across cycles in this study reflects the development of students' confidence and familiarity with problem-solving tasks presented through contextual scenarios.

The use of concrete learning media, such as beads, also contributed to the improvement in learning outcomes. As stated by Sari et al. (2024), manipulative media play a crucial role in elementary mathematics learning by helping students visualize abstract concepts. When combined with CTL, concrete media enhance students' ability to understand relationships between numbers and operations, leading to higher achievement and mastery levels.

Overall, the discussion confirms that the increase in student learning outcomes after the second cycle was not incidental but resulted from the systematic implementation of the CTL model. The improvement in learning completeness supports the conclusion that CTL is an effective instructional approach for improving mathematics learning outcomes in elementary schools, particularly when implemented consistently and supported by appropriate learning media.

CONCLUSION

This research is a classroom action research (CAR) on the Implementation of Contextual Teaching and Learning (CTL) to Improve Mathematics Learning Outcomes of Fifth Grade Elementary School Students which has been implemented at SD Negeri 46 Lubuklinggau City. Based on the research results obtained there is an increase in student learning outcomes starting from cycle 1 and cycle 2. The increase in learning outcomes can be seen in the results of the pre-test and post-test implementation which experienced an average value. With the implementation of CTL-oriented learning carried out, it can make students think more critically in solving mathematics problems, which are given by looking at everyday life or in real life.

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