Jurnal Ilmiah Mandala Education (JIME)
Vol 11 No. 4 Oktober 2025
p-ISSN : 2442-9511, e-2656-5862
DOI: *10.58258/jime.v11i4.9366/http://ejournal.mandalanursa.org/index.php/JIME*

Improving The Ability Of Subtracting Small Numbers By Large Numbers Using The Jurang Board Media For 2nd Grade Elementary School Students At Sdn 4 Gondang In The 2024/2025 Academic Year

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Article Info

Article history:
Accepted: 17 August 2025
Publish:10 October 2025

Keywords:
Abacus Board Medium,
Subtraction,
Learning Outcomes,
Action Research,
Second-Grade Elementary School.

Abstract

This study aims to determine the effectiveness of using a cliff board in improving the ability of second-grade students at SDN 4 Gondang in subtraction operations between small and large numbers. This study is a classroom action research (CAR) conducted in two cycles. Each cycle consists of two *sessions, each allocated 2×35 minutes per session. Each cycle includes the stages of planning, implementation, observation, and reflection. Data was collected through post-test assessments at the end of each cycle and observations of teacher and student activities during instruction. The results of the study indicate an improvement in student learning outcomes, with the average student score increasing from 54 in Cycle I to 84.5 in Cycle II. Student learning achievement also improved significantly from 45% in Cycle I to 90% in Cycle II. Thus, the use of the abacus board medium was proven effective in improving students' ability in subtraction operations.*

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1. INTRODUCTION

Education is a deliberate process designed to produce desired outcomes in accordance with established goals. Education as a program involves several components working together to achieve programmed objectives. Evaluation of educational outcomes is necessary to ensure that educational goals are achieved effectively and efficiently.

Mathematics is a fundamental subject that is crucial to teach from an early age because it plays a significant role in developing logical, analytical, and systematic thinking skills. However, preliminary observations at SDN 4 Gondang revealed that many second-grade students struggled to grasp the concept of subtraction, particularly when subtracting small numbers from large numbers. This difficulty not only impacted students' academic achievement but also led to a lack of confidence in their math abilities.

This problem is exacerbated by the teaching methods employed by teachers, which are still classical, focusing on lectures and practice exercises without any variation or creative approaches. This makes students less motivated and makes it difficult to fully understand the material, especially abstract topics like subtraction. As a result, the expected learning objectives are not optimally achieved, and student interest in mathematics tends to decline. Therefore, a more innovative learning approach is needed that is tailored to the characteristics and needs of lower-grade students.

According to Jean Piaget, second-grade elementary school students are in the concrete operational stage, where they understand concepts more easily through hands-on, concrete, and

manipulative activities. At this stage, the use of real objects or props is crucial in helping them grasp abstract mathematical concepts, such as subtraction. Learning that is solely verbal or symbolic will be difficult to grasp without direct experience.

Bruner also emphasized the importance of learning stages that start from enactive (using real objects), iconic (using pictures), to symbolic (using numbers or symbols). Thus, to teach the concept of reduction effectively to 2nd grade students, teachers need to use learning media and strategies that involve manipulating concrete objects and visualizing concepts.

From these theories, it can be concluded that a creative, contextual, and concrete activity-based learning approach is essential to helping students understand basic mathematical concepts, particularly subtraction. Therefore, innovative learning strategies that are appropriate to students' cognitive development are necessary to optimally achieve learning objectives.

Midterm exam scores showed that many students had not met the Minimum Completion Criteria (KKM) for mathematics. The average score was 49.25, with only 2 out of 20 students meeting the KKM standard. Most students found mathematics uninteresting and boring, which impacted their poor learning outcomes.

Teaching methods that lack creativity and tend to lean toward a classical approach cause students to struggle to understand the material, including basic mathematical concepts like subtraction. According to the constructivist theory proposed by Jean Piaget (1952), learning is an active process in which students individually construct their own knowledge based on direct experience. In a constructivist approach, students do not simply passively receive information but engage in activities that enable them to construct meaning through interactions with their environment and concrete objects. Therefore, non-interactive and minimally exploratory learning methods do not provide space for students to actively participate in the learning process, making it difficult for them to develop a deep understanding of the mathematical concepts being taught.

Besides cognitive aspects, students' low interest in mathematics is also related to motivational factors. Students who find math boring and unchallenging tend to have low learning motivation. According to Abraham Maslow's hierarchy of needs theory (1943), the need to feel valued, recognized, and accomplished is a crucial driver of learning activities. Without these needs met, students tend to lose enthusiasm for learning.

This is reinforced by Herzberg's Two-Factor Theory (1959), which states that work or study motivation is influenced by motivating factors such as achievement, recognition, and responsibility. If learning is not designed to be engaging and challenging, students will not feel satisfied with the learning process, ultimately resulting in low motivation and poor learning outcomes.

A lack of learning media makes it difficult for students to visualize abstract concepts like subtraction. Active Learning Theory (Jerome Bruner) emphasizes the importance of using visual aids and manipulatives to help students grasp abstract concepts. A chasm board can help students visualize the subtraction process in a more concrete and intuitive way, making it easier for them to grasp the concept.

Many students struggle with subtraction, especially with large numbers. According to B.F. Skinner's Behaviorist Learning Theory, effective learning involves positive reinforcement that can improve students' skills and confidence. Active Learning Theory (Jerome Bruner): This theory emphasizes the importance of using learning strategies that enable students to actively participate in their learning.

Through discussions with classroom teachers, researchers proposed using more creative and interactive learning methods to address this issue. One proposed solution is the use of a gap board in subtraction learning. The gap board is expected to help students understand the concept of subtraction in a more concrete and engaging way.

The use of a gap board as a visual aid in subtraction learning at SDN 4 Gondang can help students understand the concept of subtraction more concretely. By viewing a visual representation of

the subtraction process on the gap board, students have the opportunity to construct their own knowledge in a more interactive and enjoyable way. By using the gap board, students can be given repeated practice and receive immediate feedback, which can strengthen their understanding of the concept of subtraction.

The use of a gap board in this context offers a potential approach to enhancing students' understanding of mathematical concepts. With its visual and interactive nature, the gap board provides a clear representation of mathematical processes such as subtraction. This allows students to directly observe and follow the steps of subtraction by visually seeing the movement of numbers or objects.

According to the Active Learning Theory proposed by Jerome Bruner (1966), learning will be more meaningful if students are given the opportunity to discover concepts through stages of representation, namely enactive (direct experience), iconic (pictures or visuals), and symbolic (symbols or numbers). In the context of mathematics learning, the use of aids such as cliff boards can help students understand abstract concepts such as subtraction through concrete visual and manipulative representations. Thus, students not only memorize procedures, but also understand the meaning of the subtraction process itself through direct experience.

Jean Piaget (1952), through his Constructivism Theory, emphasized that students construct their knowledge through active interaction with their environment and learning materials. The use of manipulative media such as cliff boards provides space for students to explore, test, and construct their own understanding of mathematical concepts, especially abstract ones. This hands-on activity is highly appropriate for the cognitive developmental stage of lower-grade students, who are still in the concrete operational stage.

Edgar Dale (1969), through his Cone of Experience theory, stated that visual media plays a crucial role in helping students understand and remember information. The more concrete and visual a learning experience is, the more likely students are to understand and remember the material. Therefore, a chasm board as a visual medium in mathematics learning can improve students' conceptual understanding of subtraction because visualized information is easier to process and remember.

Based on the three learning theories mentioned, the use of the abyss board media. Overall, these three theories support the use of the abyss board as an effective mathematics learning tool. This media not only facilitates the visualization and manipulation of mathematical concepts concretely, but also activates students to be actively involved in learning, constructing their own understanding, and strengthening mental representations of the subject matter. With this approach, mathematics learning at SDN 4 Gondang can be more meaningful and effective, creating a learning environment that supports cognitive development and deep understanding for students.

Based on the problems described, the researcher was finally interested in conducting research with the title, "Improving the Ability to Subtract Small Numbers from Large Numbers Using the Chasm Board Media in Grade 2 Elementary School Students at SDN 4 Gondang.

2. MATERIALS AND METHODS

The research method used in this study is classroom action research (CAR). Classroom action research comes from English, namely Classroom Aktion Research, which means research with actions carried out in the classroom. Kunandar in classroom action research has three elements or concepts. The research was conducted at SDN 4 Gondang, namely for grade 2 students in the 2024-2025 academic year. The research procedure uses Classroom Action Research which is an action that aims to improve and enhance the learning process in the classroom in a more quality manner so that students can achieve better learning achievements with research treatment in the form of a series of activity cycles. This research is planned to use 2 cycles according to the changes achieved, each cycle consisting of planning, implementation, observation and reflection.

The data collection techniques used were Observation, Tests and Documentation with data analysis in this study in the form of analysis of learning outcomes and analysis of observation results.

1) Analysis of learning outcomes

Analysis of learning outcomes using individual and classical learning completion.

a) Individual learning completion

This learning completion refers to the specified KKM (minimum completion criteria). The formula used is:

$$N = \frac{\text{Total Score Obtained}}{\text{Maximum score}} \times 100$$

Information:

N = each student's score. A student is considered to have completed their studies if they have met the minimum completion criteria (KKM) determined with a standard score of ≥ 65.

b) Classical learning completion

This classical learning completion refers to the number of students who have completed the Minimum Competency (KKM) divided by the total number of students. The formula used is:

$$KB = \frac{\text{Number of Students Completing the Program}}{\text{Total of Students}} \times 100\%$$

Information:

KB = Learning completion criteria classical learning completion

It is said that learning has been completed if it has met the classical completion criteria standard, namely ≥ 85% of students have completed learning.

3. RESULTS

This research was conducted in class II of Gondang 4th State Elementary School, Gangga District, North Lombok Regency, with 20 students, consisting of 8 boys and 12 girls. This classroom action research was conducted in order to improve student learning outcomes in Mathematics by implementing a ravine board media.

Before implementing the classroom action, the researcher first observed the learning process in the classroom, especially on the material on subtracting small numbers from large numbers, and observed students' abilities in completing subtraction operations without using a gap board.

The initial research phase was conducted on Friday, May 15, 2025. During this phase, the

Table 01. Mathematics Scores in Cycle II

No	Students' Name	Mark	Criteria	
			Completed	Not Completed
1	Andika Danurwanta	95	✓	
2	Alpandi Mumtas	95	✓	
3	Amelia Puspita	95	✓	
4	Amelia Binta Atira	95	✓	
5	Aulianil Pitria	80	✓	

6	Aja Elijia Putri	56		✓
7	Ajilin Parija Mupia	55		✓
8	Cici Oktapia	80	✓	
9	Delika Aisa Putri	85	✓	
10	Padila Ana Humaira	85	✓	
11	Paja Aldiansyah	85	✓	
12	Patan Almaisya Islam	90	✓	
13	Hadis Tika Wibawa	80	✓	
14	Hauara Najipa	75	✓	
15	Hayatul Saipira	90	✓	
16	Hispa Sahaya Sapura	85	✓	
17	Jiordanil Ilham	75	✓	
18	Muhamad Hamdan	90	✓	
19	Muhammad Alip	80	✓	
20	Lira Vayoja	95	✓	
	Total	1.690		
	Average	84,5		

In addition to the increased average grades, student participation in learning activities also showed significant progress. In cycle I, active student participation only reached 62.5%, while in cycle II, it increased to 100%, indicating that all students were actively involved in the learning process.

Table 02. Analysis of Cycle II Evaluation Results Values

No	Aspects observed	Mark
1	The highest score	95
2	Lowest Value	55
3	Number of students who achieved KKM	20 (90%)
4	Number of students who have not reached the KKM	2

Based on the results above, it can be concluded that the application of the ravine board media has succeeded in improving the abilities of class II students of SDN 4 Gondang in working on subtraction problems, especially for subtracting small numbers from large numbers. The advantages of this media include: (1) it does not require difficult or expensive tools, (2) it does not burden students' brain memory, and (3) it is easy to use and carry anywhere, and (4) it can help students learn in a concrete and enjoyable way.

Thus, this study shows that the gap board media is an effective solution in mathematics learning, especially to improve student learning outcomes in subtraction material in class II of SDN 4 Gondang.

4. CONCLUSION

The application of the gap board media to improve mathematics learning outcomes in the topic of subtracting small numbers from large numbers in grade II of SDN 4 Gondang, Gangga District, North Lombok Regency has proven effective. This can be seen from the results of observations of student learning activities in the first cycle with an average student activity score of 62.5% with the criteria of being quite active. In the second cycle, the average student activity score experienced a significant increase to 90% with the criteria of being active.

Meanwhile, in terms of the results of the student ability test in answering subtraction math problems, in cycle I the average score obtained by students was 54, with the number of students who completed as many as 9 students out of 20 students. In cycle II, there was a very significant increase, where the average student score rose to 84.5 and all students (90%) achieved learning completion.

The use of the gap board has also been shown to improve students' understanding of the concept of subtraction. This is evident in the percentage of classical learning completion, which only reached 54% in cycle I, but then increased significantly to 100% in cycle II. Therefore, the use of the gap board in subtraction learning has a positive impact on improving the mathematics learning outcomes of second-grade students at SDN 4 Gondang.

5. ACKNOWLEDGEMENTS

Thank you to the entire extended family of SDN 4 Gondang who have given the researcher the opportunity to carry out this research and to the entire academic community of STKIP Hamzar who always support this research.

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