

Application of Place Value Board Media in Improving Students' Understanding of Grade III SDN 138 Sabajior on the Place Value Material of Integrated Numbers Up to 1000

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ABSTRACT

Understanding the concept of place value is one of the basic skills that elementary school students must have in learning mathematics. However, in reality, there are still students who have difficulty in understanding the value of a number based on its position in the number. This article aims to describe the application of place value board media in improving the understanding of third-grade students of SDN 138 Sabajior on the material of place value of whole numbers up to 1000. This activity was motivated by the results of an interview with the third-grade teacher, Muhammad Aswan, S.Pd., which showed that some students still had difficulty in distinguishing the value of numbers based on their position, determining units, tens, hundreds, and thousands, and stating the value of a number in a number. The method used was descriptive qualitative with data collection techniques in the form of interviews, observations, and documentation. The subjects of the activity consisted of 12 third-grade students who attended from a total of 18 students. The application of the media was carried out by introducing a place value board consisting of units, tens, hundreds, and thousands columns, then students were given the opportunity to arrange and place numbers according to their place value. The results of the activity showed that the use of place value board media was able to help students understand the concept of place value more concretely. Students find it easier to group numbers into appropriate columns, determine the value of a number based on its position, and decompose numbers into hundreds, tens, and ones. Furthermore, the use of media also increases student engagement, attention, and enthusiasm during the learning process. Therefore, place value boards can be used as an effective alternative learning tool to enhance students' understanding of the place value of whole numbers up to 1000 in elementary school.

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INTRODUCTION

Education is a conscious and planned effort to develop students' potential so that they possess the intellectual, spiritual, emotional, and social abilities necessary for social life (Sari et al., 2025). One subject that plays a crucial role in achieving these educational goals is mathematics (Riki &

Kusno, 2023). Mathematics not only serves as a means to develop numeracy skills but also plays a role in cultivating logical, critical, systematic, creative thinking, and problem-solving skills (Handayani, 2025). Therefore, mathematics instruction should be provided starting in elementary school to equip students to understand more complex concepts at subsequent levels of education.

Mathematics instruction in elementary school has distinct characteristics from other levels of education. At elementary school age, students are still in the concrete operational cognitive development stage (Mytra & Christi, 2024). At this stage, students more easily grasp a concept when presented through real-life experiences, concrete objects, or learning media that can be directly observed and used. Conversely, students will experience difficulties when they have to understand abstract concepts without the aid of media or teaching aids (Islamiah et al., 2025). Therefore, teachers are required to be able to select learning strategies and media appropriate to the developmental characteristics of students so that learning objectives can be optimally achieved.

One of the important topics in elementary school mathematics is the place value of whole numbers. This topic serves as the foundation for students' understanding of the number system and various other arithmetic operations (Ni'mah et al., 2024). Place value is the value a number has based on its position within a number (Lestari, 2022). In the decimal number system, place value consists of units, tens, hundreds, thousands, and so on (Rahmawati et al., 2026). A good understanding of the concept of place value is essential because this concept forms the foundation for learning addition, subtraction, multiplication, division, rounding, and various other mathematical topics (Hadi & Dedyerianto, 2020)..

Conceptual understanding is a crucial aspect of mathematics learning. Conceptual understanding not only means students are able to memorize the material studied, but also the ability to re-explain the concept in their own words, connect the concept to different situations, and apply it to solve various problems (Safari & Nurhida, 2024). Students with a strong conceptual understanding will more easily develop mathematical thinking skills than those who rely solely on memorization (Putri et al., 2026). Therefore, teachers need to ensure that every lesson is truly understood by students, not simply memorized temporarily.

In addition to conceptual understanding, mathematics learning outcomes are also influenced by students' mathematical representation skills. Mathematical representation is a student's ability to present a mathematical concept in various forms, such as symbols, pictures, diagrams, concrete models, or verbal language (Fajriah et al., 2020). Representational skills are crucial in mathematics learning because they help students understand the relationship between abstract concepts and concrete forms that can be directly observed (Indah et al., 2026). In place value, representational skills are essential when students connect numbers with their positions and values within a number. If students' representational skills are low, they will have difficulty fully understanding the concept of place value (Sifaunnazah et al., 2025).

Effective mathematics learning focuses not only on the final outcome but also on the process by which students acquire that knowledge. Therefore, teachers need to create learning experiences that enable students to actively engage in discovering concepts (Barokah & Mahmudah, 2025). Active student involvement in learning can help improve memory, understanding, and critical thinking skills (Panca & Parisu, 2025). Through learning activities involving observation, discussion, practice, and the use of media, students can develop a deeper understanding than simply passively listening to teacher explanations (Dahlan et al., 2025).

In the context of elementary school learning, the use of manipulative media is a widely recommended approach (Pratiwi & Darmayanti, 2025). Manipulative media are media that can be touched, moved, arranged, or manipulated directly by students during the learning process (Hartati, 2021). The use of manipulative media provides students with opportunities to learn through real-world experiences, making the concepts learned easier to grasp (Mailani et al., 2025). In mathematics learning, manipulative media has been proven to help students understand abstract concepts that are often difficult to explain using only words or mathematical symbols (Trisanti et al., 2025).

The place value of whole numbers is one topic that greatly requires the use of manipulative media. This is because students must understand the relationship between the position of a number and the value produced by that position. Without the aid of concrete media, students often simply

memorize the position of the units, tens, and hundreds digits without understanding their true meaning. As a result, when faced with different problems, students tend to make errors in determining the value of a number (Indriani et al., 2025). Therefore, media are needed that can clearly demonstrate the relationship between numbers and their place values.

In mathematics learning, students' success in understanding material is greatly influenced by the teacher's ability to present concepts systematically and in a manner that suits the students' characteristics. Student-centered learning provides opportunities for students to construct their own knowledge through learning experiences gained during the learning process (Pratiwi et al., 2024). Therefore, teachers act not only as conveyors of information but also as facilitators, helping students discover and understand the concepts being studied.

Constructivism theory explains that knowledge cannot simply be transferred from teacher to student but must be constructed by students themselves through experience and interaction with their learning environment (Nugraha & Suryadi, 2023). In mathematics learning, this theory emphasizes the importance of active student involvement in observing, experimenting, grouping, and discovering relationships between concepts. The more active students are in the learning process, the better their understanding will be. Therefore, the use of learning media that allows students to interact directly with the subject matter is crucial to support meaningful learning.

In addition to conceptual understanding, learning motivation is also a factor influencing successful mathematics learning. Learning motivation is the drive that arises from within and outside a student to engage in learning activities to achieve specific goals (Wulandari et al., 2024). Students with high learning motivation tend to be more active in learning, more confident in expressing their opinions, and more diligent in completing assigned tasks. Conversely, low learning motivation can lead to students being less interested in learning, resulting in poor learning outcomes..

One way to increase student motivation is to use engaging learning media that are appropriate for the material being taught. Learning media can create a more enjoyable learning environment, preventing students from becoming bored easily during the learning process (Utami & Fadilah, 2025). Through the use of appropriate media, students' attention can be more focused on the material being studied, and their engagement in the learning process can be optimally enhanced.

The use of learning media in mathematics also aligns with the principle of concrete-to-abstract learning. This principle explains that students need to understand a concept through real-world experiences before understanding its abstract symbols or forms (Siregar et al., 2024). Therefore, the use of concrete learning media can help students develop a stronger understanding of the mathematical concepts being studied. This is especially important for the place value of whole numbers, which requires students to understand the relationship between numbers, their position, and the resulting value from that position.

Through the use of appropriate media, the mathematics learning process is oriented not only toward achieving learning outcomes but also toward developing a deep understanding of concepts. A good conceptual understanding will help students connect their existing knowledge with new material, making the learning process more meaningful and sustainable. Therefore, the use of appropriate learning media is a crucial factor in improving the quality of mathematics learning in elementary schools.

However, in reality, students' understanding of the concept of place value remains a common problem in elementary school mathematics (Mulyasari & Fahrozy, 2023). Place value is considered quite difficult because it requires students to understand the relationship between numbers and their positions within a number (Nana et al., 2025). Many students are able to read numbers but are unable to explain the value of each digit based on its abstract location (Mustafiah et al., 2025). This difficulty indicates that students do not yet fully understand the concept of place value, requiring more effective learning efforts to help them grasp the material. Based on the results of interviews conducted by the author with the third grade teacher of SDN 138 Sabajior, namely Muhammad Aswan, S.Pd., it was obtained information that some students still have difficulty in understanding the material on the place value of whole numbers up to 1000. This difficulty is seen when students are asked to determine the position of numbers in a number or explain the value of numbers based on their position. Some students are still unable to differentiate between numbers and number values. For example, in the number 356, some students cannot explain that the number 3 has a value of 300 because it is in the

hundreds place, the number 5 has a value of 50 because it is in the tens place, and the number 6 has a value of 6 because it is in the units place.

Furthermore, interview results indicated that students frequently made errors when grouping numbers into units, tens, hundreds, and thousands. When given questions related to place value, some students tended to answer based on the number they saw without considering the number's position within the number. As a result, students experienced difficulty completing exercises and assignments related to place value. According to the class teacher, current learning methods have largely relied on lectures and textbooks, resulting in students receiving less concrete learning experiences to understand the concepts being studied.

These issues indicate that students require the assistance of learning media that can transform abstract concepts into more concrete ones. The use of learning media is one alternative that can help students understand mathematics more easily. Learning media is anything that can be used to convey information or learning messages, thereby stimulating students' attention, interest, thoughts, and feelings during learning activities. Through learning media, difficult-to-understand material can be presented in a more engaging and easier way for students to learn.

In mathematics learning, media plays a crucial role because most mathematical concepts are abstract (Saman, 2023). The use of appropriate media can help students visualize the concepts being studied, making learning more meaningful (Yusnaldi et al., 2025). Furthermore, learning media can increase learning motivation and student engagement, and create a more enjoyable learning environment. (Kero & Wewe, 2024). With learning media, students not only listen to the teacher's explanation but also participate directly in the learning process.

One medium that can be used to help students understand place value is a place value board. A place value board is a learning tool designed in the form of columns that indicate the positions of units, tens, hundreds, and thousands (Khoiriyah et al., 2026). Through this tool, students can arrange and place numbers according to their place values, clearly demonstrating the relationship between numbers and their positions within a number. Using a place value board allows students to gain concrete learning experiences because they can directly manipulate numbers in accordance with the concepts being learned.

A place value board has several advantages. First, it can transform the abstract concept of place value into a more concrete one. Second, it is easy to make with simple materials and at a relatively low cost. Third, this media can be used repeatedly in various learning activities. Fourth, this media can increase student participation by providing them with the opportunity to be directly involved in the learning process (Mabel & Aryani, 2025). With these advantages, the place value board is considered suitable for elementary school students who still need concrete learning experiences.

Based on the problems identified through interviews at SDN 138 Sabajior, the author attempts to provide a solution by creating and implementing a place value board in mathematics lessons on the place value of whole numbers up to 1000. This tool is used to help students understand the concepts of units, tens, hundreds, and thousands more concretely, thereby minimizing the difficulties experienced by students. Through the use of this tool, students are expected to not only be able to name the digits in a number but also understand the value of each digit based on its position.

The purpose of this activity is to describe the application of a place value board in mathematics lessons for third-grade students at SDN 138 Sabajior and to understand how this tool can help improve students' understanding of the place value of whole numbers up to 1000. Furthermore, this activity also aims to provide alternative learning media that teachers can utilize to create a more effective, engaging, and meaningful mathematics learning process for students.

IMPLEMENTATION METHOD

This research used a descriptive qualitative approach. The qualitative approach was chosen because the research aimed to describe in-depth the process of implementing the place value board and changes in students' understanding following its use in mathematics learning. Through this approach, researchers were able to obtain a more detailed picture of students' conditions before and after the implementation of the learning media.

The research was conducted at SDN 138 Sabajior in the third grade of the 2025/2026 academic year. The subjects were 18 third-grade students. However, during the media implementation, only 12 students were present. In addition to the students, the third-grade teacher, Muhammad Aswan, S.Pd., also served as a source of information for this study through interviews conducted by the researcher.

Data collection techniques used in this study included interviews, observation, and documentation. Interviews were conducted with the third-grade teacher to obtain information about the current state of mathematics learning, specifically regarding the place value of whole numbers up to 1000. The interviews revealed that some students still had difficulty distinguishing the value of numbers based on their location within a number. Students also frequently make errors in determining units, tens, hundreds, and thousands, and have difficulty stating the value of a number in a specific number.

Observations were conducted throughout the learning process to assess student activity, participation levels, and responses to the use of the place value board. Observations were also used to assess changes in student understanding during the learning process. Meanwhile, documentation was conducted by collecting photographs of learning activities, the media used, and various notes related to the research implementation as supporting data.

The research procedure was implemented in several stages. The first stage was problem identification through interviews with class teachers. The second stage was the design and creation of a place value board adapted to the topic of place value for whole numbers up to 1000. The third stage was the implementation of learning using the place value board. At this stage, students were given an explanation of the concepts of units, tens, hundreds, and thousands, then asked to directly practice placing numbers in the appropriate columns on the place value board. The final stage was an evaluation of the results of the media implementation by observing students' abilities in determining place value and digit value within a number.

The data obtained were analyzed using qualitative descriptive analysis techniques. The analysis was conducted in three stages: data reduction, data presentation, and conclusion drawing. Data reduction was carried out by selecting and focusing data relevant to the research objectives. The data were then presented in narrative form to facilitate understanding of the research results. The final stage was the drawing of conclusions based on the interviews, observations, and documentation obtained during the research process.

Through this method, researchers attempt to obtain a clear picture of the effectiveness of implementing place value board media in helping to improve the understanding of third grade students at SDN 138 Sabajior regarding the material on place value of whole numbers up to 1000.

RESULTS

a. Interview Results

An interview was conducted with Muhammad Aswan, S.Pd., a third-grade teacher at SDN 138 Sabajior. The interview was conducted prior to the learning activities to determine the students' condition and the challenges they faced in mathematics learning, particularly regarding the place value of whole numbers up to 1000.

The interview revealed that several students still had difficulty understanding the concept of place value. This difficulty was evident when students were asked to determine the position of a digit in a number or to explain the value of a digit based on its location. Some students still did not understand the difference between a number and its value. Students were only able to read numbers but were unable to explain the value of each digit within the number.

According to the class teacher, students frequently made errors when defining units, tens, hundreds, and thousands. For example, in the number 672, some students still had difficulty explaining that the digit 6 was in the hundreds place, the digit 7 was in the tens place, and the digit 2 was in the ones place. Furthermore, students often made errors when breaking down numbers into their place values.

Interview results also indicate that during the learning process, students tend to understand the material more easily when using learning aids or media that can be seen and used directly. Learning that relies solely on textbooks and oral explanations often leaves students quickly bored and makes it difficult to grasp abstract material. Therefore, learning media are needed that can help students visualize the concept of place value more concretely.

Based on these interviews, the author concluded that the main problem faced by students lies in their poor understanding of the concept of place value. This situation motivated the author to implement a place value board as an alternative solution to help students understand the place value of whole numbers up to 1000.

b. Implementation of Place Value Board

The implementation of the place value board was carried out with third-grade students at SDN 138 Sabajior. The total number of third-grade students is 18, but only 12 students attended the activity. The learning activity was carried out in several stages: media introduction, demonstration of media use, student practice, and a simple evaluation.

In the initial stage, the author opened the lesson by asking several questions related to place value. These questions aimed to determine the students' initial understanding of the concepts of units, tens, hundreds, and thousands. The students' answers indicated that some students still experienced confusion in determining the value of a number based on its position in the number.

Next, the author introduced the place value board to the students. The board consists of several columns labeled units, tens, hundreds, and thousands. The board provides numbers that can be moved and placed according to the desired position. Before students used the board, the author explained the function of each column and how to use it.

After the explanation was complete, the author provided examples of how to use the board. For example, in the number 458, the digit 4 is placed in the hundreds column, the digit 5 in the tens column, and the digit 8 in the ones column. Through this example, students can directly see the relationship between the position of a number and its value.

In the next stage, students were given the opportunity to use the media directly. Students were asked to come to the front of the class in turns to arrange several numbers provided by the author. This activity went quite well, as students appeared enthusiastic and interested in using the provided media. Most students demonstrated a high level of curiosity and strove to complete the assigned task correctly.

When students began using the place value board, changes were seen in the way they understood the material. Students who had previously been confused about determining place value began to be able to group numbers according to the available columns. They also began to understand that the position of a digit in a number significantly influences its value.

During the learning process, interaction between students and the teacher also improved. Students became more active in asking questions when they encountered difficulties and were more confident in answering questions. The learning atmosphere appeared more lively compared to previous lessons that had only used the lecture method.

At the end of the activity, the author provided several simple exercises related to place value. Based on the results of these exercises, most students were able to determine units, tens, hundreds, and thousands with greater accuracy. Furthermore, students were also able to decompose numbers into place value with a greater degree of accuracy than before using the media.

Overall, the use of the place value board provided a different learning experience for students. Learning became more engaging, students were more actively engaged in the learning activities, and the concept of place value became easier to understand because it was presented in a concrete form.

c. Activity Documentation

Documentation was conducted during the activity to demonstrate the implementation of the place value board for third-grade students at SDN 138 Sabajior. This documentation aims to strengthen the research data and provide a concrete picture of the learning process. The activity documentation obtained includes:



Figure 1. Interview with a Grade III Teacher at SDN 138 Sabajior

This documentation shows an interview conducted by the author with a third-grade teacher, Muhammad Aswan, S.Pd., to obtain information about the students' difficulties in understanding the place value of whole numbers up to 1000.



Figure 2. Place Value Board Media Used in Learning

This documentation displays a place value board used as a learning aid. The board consists of columns for units, tens, hundreds, and thousands, which students use to understand the position and value of a digit in a number.



Figure 3. Presenting Place Value Material to Students

This documentation shows the author's explanation of the place value of whole numbers up to 1000 to third-grade students before using the place value board.



Figure 4. Student Activity Using the Place Value Board

This documentation shows students practicing using a place value board by placing numbers in the appropriate columns. This activity aims to help students understand the relationship between number position and place value.



Figure 5. Group Photo of Students After Learning Activity

Dokumentasi ini merupakan foto bersama antara penulis, guru kelas III, dan siswa setelah seluruh rangkaian kegiatan pembelajaran selesai dilaksanakan sebagai bentuk penutupan kegiatan.

Berdasarkan dokumentasi yang diperoleh, terlihat bahwa siswa mengikuti pembelajaran dengan antusias dan berpartisipasi aktif selama kegiatan berlangsung. Penggunaan media papan nilai tempat mampu menciptakan suasana belajar yang lebih menarik, interaktif, dan menyenangkan sehingga membantu siswa memahami materi nilai tempat bilangan cacah sampai 1000 dengan lebih baik.

DISCUSSION

Based on the results of interviews, observations, and documentation, it is clear that the use of a place value board has a positive impact on the understanding of third-grade students at SDN 138 Sabajior on the place value of whole numbers up to 1000. Before using the board, some students still had difficulty distinguishing the value of numbers based on their position. This difficulty was evident in the numerous errors they made when determining units, tens, hundreds, and thousands.

According to the author's analysis, the difficulties experienced by students were caused by the abstract nature of place value. Students cannot simply listen to teacher explanations; they need media that can help them directly see the relationship between numbers and their place value. Therefore, the use of a place value board is an appropriate solution because it can transform abstract concepts into more concrete and understandable concepts.

During the learning process, students not only listen to teacher explanations but also directly participate in the use of the board. This active involvement provides opportunities for students to construct their own understanding through real-life learning experiences. When students move numbers into the ones, tens, hundreds, and thousands columns, they directly learn the concept of place value through practice, not just memorization.

According to the authors, the learning experience gained through the use of media has a significant impact on student understanding. Students who initially found it difficult began to understand that a single number can have different values depending on its location. For example, the number 3 can be worth 3, 30, or 300 depending on its position in the number. This understanding is more easily achieved by students when they can see and practice directly using a place value board.

The findings in this study align with research that states that place value boards can help students understand the concept of place value more concretely and increase student engagement in mathematics learning. This media provides students with opportunities to engage in manipulative activities, making abstract mathematical concepts easier to grasp.

Furthermore, other research has shown that the use of place value media can improve student understanding because learning becomes more interactive and student-centered. The use of media helps students understand the relationship between numbers and their positions in numbers more clearly.

The results obtained from this activity also indicate an increase in student engagement during the learning process. Before the use of media, some students tended to be passive and simply listened to the teacher's explanations. However, after the use of media, students became more active in asking questions, answering questions, and participating in learning activities. This situation demonstrates that learning media not only helps improve conceptual understanding but also enhances students' motivation to learn.

According to the author, this increased motivation occurs because the point-point board provides a unique learning experience. Students are interested in trying and using the media, increasing their attention to the learning material. This interest then leads to increased student participation during the activity.

The author also found that the point-point board can assist students with varying learning abilities. Students who previously struggled can engage better in the learning process because the media provides visual aids that facilitate comprehension. Meanwhile, students who already understand the material can further strengthen their understanding through practical activities using the media.

These findings support previous research that stated that concrete learning media is highly effective for use at the elementary school level because it aligns with the developmental characteristics of students who still require real-world and visual learning experiences. The use of media that can be directly manipulated helps students develop mathematical concepts gradually and more meaningfully.

Based on all the results obtained, the author concludes that the place value board is an effective medium for use in mathematics learning, particularly for the place value of whole numbers up to 1000. This medium can help students understand previously difficult concepts, increase learning engagement, foster self-confidence, and create a more enjoyable learning environment. Therefore, the place value board can be recommended as an alternative learning medium for elementary school teachers to improve the quality of mathematics learning.

CONCLUSION

Based on interviews, media implementation, observations, and documentation conducted in third-grade students at SDN 138 Sabajior, it can be concluded that students still experience difficulties in understanding the place value of whole numbers up to 1000. This difficulty is evident in some students' inability to distinguish the value of numbers based on their position, determine units, tens, hundreds, and thousands, and explain the value of a digit in a number. This condition often causes students to make errors when solving problems related to place value.

To address this problem, the author implemented a place value board as a mathematics learning aid. This tool is used by placing numbers in the units, tens, hundreds, and thousands columns so that students can directly see the relationship between the position of the digit and its value. The media application was conducted with 12 of the 18 third-grade students at SDN 138 Sabajior.

The results showed that the place value board helped students better understand the concept of place value. Students found it easier to group numbers into the appropriate columns, determine the value of a number based on its position, and decompose numbers into hundreds, tens, and ones. Furthermore, the use of media also increases student engagement, attention, and enthusiasm during the learning process.

Therefore, place value boards can be used as an effective alternative mathematics learning tool to enhance students' understanding of the place value of whole numbers up to 1000. This media can make learning more concrete, engaging, and tailored to the characteristics of elementary school students, thus helping to optimally achieve learning objectives.

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