

THE USE OF STANDING BOARD TO IMPROVE STUDENT LEARNING OUTCOMES IN SCIENCE EDUCATION IN ELEMENTARY SCHOOLS

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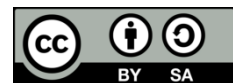
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ABSTRACT

Science education in elementary schools often faces challenges in creating an engaging and meaningful learning environment. One of the main obstacles is the use of lecture-based methods, which make students less active and result in low learning outcomes. This study aims to evaluate the use of standing boards as an alternative visual learning medium in improving student learning outcomes on the subject of animal classification based on habitat and reproduction methods. The study was conducted using the Classroom Action Research (CAR) method, consisting of two cycles in Grade VI of SD Negeri Lembursitu, Sukabumi City. The instruments used included achievement tests and observation sheets for student and teacher activities. The results showed an increase in the average student score from 68 in the pre-cycle to 76 in cycle I, and reached 85 in cycle II. Student learning activities also showed positive development in engagement and participation during the learning process. In conclusion, the use of standing boards proved effective in improving students' science learning outcomes and fostering a more interactive and enjoyable learning process.

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1. INTRODUCTION

Learning outcomes are the process of mastering knowledge, skills, and attitudes acquired by students through learning activities. This includes cognitive, affective, and psychomotor abilities. Learning outcomes are indicators of the success of the learning process and influence the overall development of students. In this study, the author only examined the cognitive domain of students, focusing on two levels in Bloom's taxonomy, namely C4 (analyzing) and C5 (concluding). This study aims to determine the extent of students' ability to analyze information (C4) and their ability to draw conclusions based on data or facts that have been studied (C5). Measurements were conducted individually to assess students' absorption of the taught material and the learning outcomes achieved. Therefore, learning outcomes must be measurable, relevant, and aligned with educational objectives. This relates to what the speaker conveys to the audience in the educational context, meaning the teacher to the students. (Pangesti et al., 2024) learning outcomes are the successful achievement of competencies in the form of knowledge that serves as

a benchmark for students in learning. Teachers are required to convey information that is clear and easy for their students to understand, with innovative content that stimulates creativity and curiosity. As students' learning outcomes improve in each subject they study, this will lead to improved academic performance, increased competitive ability, enhanced self-confidence, and better independent learning skills. However, the reality is that students' learning outcomes remain relatively low, and classroom learning environments still rely heavily on lecture-based methods and question-and-answer sessions. As a result, students do not fully grasp the material being taught, which can lead to feelings of boredom and disengagement in understanding the subject matter. This aligns with the opinion that (Rahayu & Pratiwi, 2024) The learning process requires teachers to understand what they are teaching their students. Conversely, students' understanding is still monotonous, meaning that the learning atmosphere in the classroom still uses lecture and question-and-answer methods, so that students only listen to the teacher's explanations, which can cause them to feel bored and tired of understanding the material.

وَتِلْكَ الْأَمْثَالُ نَضْرِبُهَا لِلنَّاسِ وَمَا يَعْقِلُهَا إِلَّا الْعُلَمَاءُ

Meaning: “We have made these parables for mankind. But no one will truly understand them except those who are knowledgeable” (Q.S Al-'Ankabut Verse 43).

Al-'Ankabut Verse 43 explains that every parable has a deeper meaning, but not everyone is able to truly understand it. Only those who are knowledgeable or those who truly think, reflect, and use their intellect will be able to grasp what is meant by it. Generally, parables in the Qur'an are explained in the form of illustrations that reflect the realities of life, with the primary purpose of teaching moral values and wisdom, as well as reminding humanity of the signs of Allah's power. Since humanity's destiny is to be stewards of the earth, humans are required to preserve and lead the earth in various ways, one of which is by studying knowledge. Additionally, humans are required to worship Allah SWT, so we must study worldly knowledge and also fulfill our obligation to worship Allah SWT. By studying diligently and improving our learning outcomes, we will not merely read the verses of the Qur'an literally but also reflect on them deeply, connecting them with knowledge to understand the moral wisdom conveyed. Another meaning of this verse is that the parables in the Quran cannot be understood without using reason and knowledge. Thus, as rational beings, humans are required to continue thinking in order to enhance their understanding. Studying the Quran is not limited to learning to read, understanding its meaning, studying its recitation, or memorizing it, but the values contained in the Quran should be applied (Baidowi & Solehuddin, 2021)

Based on interviews with sixth-grade teachers, several issues were identified. First, student learning outcomes in science are still low because teachers usually deliver science material using the lecture method. Second, teachers do not use learning media, which results in students losing interest and becoming bored quickly when teachers explain the material. Third, there is a lack of teaching materials available to teachers to maximize teaching and learning activities. In fact, by utilizing learning media, students will find the learning process easier, so media is needed to help improve student learning outcomes in the learning process. The use of media to achieve improved learning outcomes in learning activities is very important because media is one of the learning tools used as a useful intermediary to convey more in-depth information in the classroom from teachers to students (Kustandi et al., 2021)

Students' learning outcomes in mastering science material can be said to be still low. Science is often considered difficult by elementary school students because it is not used in everyday life. Additionally, due to the limited availability of facilities and infrastructure to support science learning activities to the fullest extent, this aligns with what was stated by (Fadillah et al., 2024). The lack of facilities and infrastructure in schools means that during the learning process, teachers rarely use learning media to support the learning process in the classroom. Science itself consists of several fields of study, making it a challenge for teachers to present material that is interesting to all students in the classroom. Therefore, creating an engaging learning environment is one approach teachers can utilize, such as using standing boards to create a learning environment that is not monotonous and quickly becomes boring, thereby capturing students' attention and making the material easier for elementary school children to understand. As a result, students will feel happier and find it easier to understand the material being taught, as the material presented becomes more effective.

The selection of standing boards as a medium in this study was motivated by the great potential shown by this medium in improving learning outcomes and student engagement during the learning process. By utilizing standing boards, the author hopes that students will find it easier to understand science material, thereby improving their learning outcomes. This is in line with what was stated by (Pratama & Hadi, 2023) that learning media is one solution to the problem of how to convey sophisticated content visually and attractively to children in elementary school science classes. Thus, it is hoped that students will become more interactive when science lessons are conducted in class. The standing board has shown positive results as it can capture students' attention. Through this medium, students are not only listening to explanations or taking notes but are also actively engaged in more interactive learning activities. This allows students to learn in a enjoyable atmosphere, combining elements of play and utilizing technology in the learning process. This approach is expected to improve students' learning outcomes in science subjects. This statement is supported by the opinion of (Handayani & Haryati, 2024), who state that the use of technology in education is applied as an auxiliary element in improving learning media. One application of technology in education, particularly in learning media, is the use of QR codes or Quick Response Codes.

Although there have been no previous studies that directly examine the use of standing boards, there are several studies that are relevant or similar in the context of using innovative media, such as smart boxes. These studies serve as important references supporting the implementation and theoretical foundation of this research. (Saofah et al., 2025) In their study, they discussed the development of Smart Box media based on Science Environment Technology Society (SETS) in science education at elementary schools. Students rated the Smart Box media with a score of 90%, which was considered very good. Additionally, the impact on science learning achieved a value of 0.592 or 59%, interpreted as Moderate and Sufficiently Effective. Therefore, it can be concluded that the Smart Box media enhances student learning outcomes. The connection between this study and the previous study lies in the Smart Box media. In the study by (Putri et al., 2024), the focus was on the application of Smart Box media to improve learning outcomes for fourth-grade elementary school students on the topic of Indonesia's cultural heritage. The use of Smart Box media helped students understand lessons more quickly and made learning more enjoyable and engaging. Based on the research findings, the use of Smart Box media improves students' cognitive learning outcomes. The learning achievement rate of students after using Smart

Box media was 43% in the pre-cycle, 64% in Cycle I, and 89% in Cycle II. The connection between this study and the previous research lies in the students' learning outcomes.

Media standing boards are one of the innovations in learning that offer a visual and interactive approach, especially in conveying material on animal diversity. This media is designed to increase student engagement by inserting QR codes containing learning materials and evaluation quizzes, which can be scanned to enrich students' understanding digitally. Additionally, this media allows students to practice pronouncing animal names in English correctly, thereby supporting the development of foreign language skills in a contextual manner. However, the use of this media also has limitations, particularly in terms of accessibility. Not all students bring their phones to school, so QR code scanning must be done by the teacher. This limits direct student interaction with the media and slows down the learning process. Therefore, this study contributes to innovation by evaluating and examining the effectiveness of standing boards as an innovative alternative in science education at the elementary school level. This study aims to address the need for interactive yet simple learning media and provide solutions to the limitations of technology use in the classroom.

2. METHOD

This study uses classroom action research (CAR). Classroom action research is a type of research that reflects on a classroom with the aim of improving understanding and reasoning about the educational process in order to increase knowledge and skills, thereby improving student learning outcomes. Classroom action research is intended to specifically examine a classroom and its learning process. According to (Usman et al., 2019) in a book entitled *Practical Introduction to Classroom Action Research*, classroom action research, like action research in general, uses four steps, as suggested by Kemmis and Taggart (1988): planning, implementation, observation, and reflection.

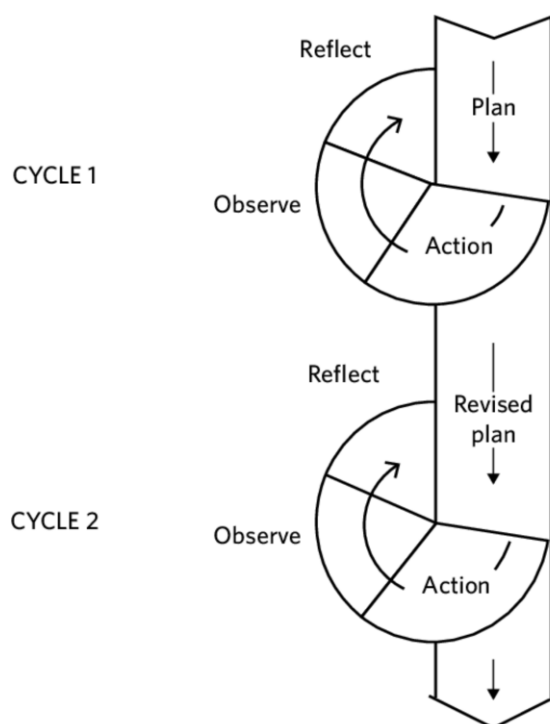


Figure 1. Kemmis and Taggart Model

Classroom action research is conducted by observing the situation in the classroom, while taking into account the objects and events that occur during the learning process. This method is carried out by implementing specific actions to enhance the effectiveness of teaching and learning activities. The classroom action research model used in this study refers to the model developed by Kemmis and Taggart. According to Kemmis and Taggart, classroom action research is carried out as follows in Figure 1.

In Figure 1 this series, every process that occurs has meaning. The pre-research stage is conducted before the implementation of actions in the classroom. The steps in this stage include determining the school where the research will be conducted, obtaining permission from the school, and conducting initial observations to identify problems in learning. After that, the researcher develops research instruments such as observation sheets and tests, then conducts preliminary tests and observations in the classroom. To strengthen the theoretical basis, the researcher searches for literature relevant to the issues identified, then develops a research proposal and presents it in the form of a proposal seminar. In the action planning stage, which follows the pre-research phase, the researcher begins by developing an action plan for Cycle I. During this stage, the researcher prepares learning materials, learning media in the form of a standing board, and research instruments. All of these tools and media were then discussed with the supervising lecturer, followed by testing the media to ensure their suitability. Preparation of materials and tools was also carried out to support implementation in the classroom. For cycle II, the activities were similar to those in cycle I, but with improvements based on the previous evaluation results. The lesson plan was reviewed and revised to address the issues that arose in cycle I.

Actions and observations were carried out simultaneously during the research. The researcher acted as a teacher, assisted by an observer. The observer observed the activities of the teacher, students, and developments that occurred in students during the learning process, referring to the observation sheet. During the intervention phase, the researcher conducts instruction in accordance with the learning syntax. Subsequently, the researcher reflects on the activities at this stage, which involves communication between the researcher, the supervising lecturer, and the teacher regarding the strengths, weaknesses, and challenges of the standing board activity in enhancing learning outcomes. This is done by analyzing the results from field notes, including the observation sheet, and student test results. The researcher then seeks ways to address the identified weaknesses. The participants in this study were 32 sixth-grade students at Lembursitu Public Elementary School in Sukabumi City, consisting of 14 female students and 18 male students. Data collection techniques in this study were carried out in several stages, namely tests and observations. In the test stage, students worked on multiple-choice and essay questions prepared by the researcher to obtain data on the extent of the students' abilities. In addition, the researcher also conducted observations during science learning activities. These observations were carried out directly using observation sheets for students and observation sheets for teachers as observation guidelines. Data analysis was performed using quantitative descriptive analysis, in which test results were expressed in numerical form. The processing steps included: compiling the scores obtained by students, calculating the class average score, and calculating the level of student learning achievement. Meanwhile, the data from the observation results were analyzed by preparing observation sheets for teachers and students, then writing down and calculating the scores for student and teacher activities during the learning process.

3. RESULTS AND DISCUSSION

The results and discussion in this study explain the data collected during the research process. The data is divided into three stages, namely the pre-cycle stage, cycle I, and cycle II. In the pre-cycle stage, initial data collection was carried out to determine the initial condition of the students before the intervention was given. Next, in cycle I, the first intervention was carried out based on the plan that had been made, and the results were analyzed to determine the improvements that occurred. Then, in cycle II, the intervention was continued as an improvement from cycle I, with the hope of achieving more optimal improvements in student learning outcomes. Each stage was analyzed to see the progress and effectiveness of the interventions provided during the learning process.

3.1. Application of Standing Board Media in Science Learning in Elementary School

The use of standing boards in teaching was carried out as part of classroom action research with the aim of improving student learning outcomes as stated by (Qitfirul & Izza, 2023) the PTK research was conducted through the pre-cycle, cycle I, and cycle II stages. The learning activities were carried out in two cycles, with each cycle consisting of two meetings. During the learning process, direct observation of student activities was carried out using observation sheets that had been prepared in advance.

Learning that integrates standing boards has been proven to improve student learning outcomes. In a study conducted at Lembursitu State Elementary School, students were seen to be more active during the learning process when using this medium. They were more enthusiastic in answering questions and participating in learning activities. The students' enthusiasm and motivation also increased as the learning process with the standing board media progressed. This is in line with the opinion (Amalia & Nur, 2022) There is a scannable QR code containing information about the animal's name, how it reproduces, where it lives, and the animal's name in English. Based on the information provided, this learning medium is suitable for use in science and English lessons to learn vocabulary. This is also reinforced by the opinion that (Novitasari, 2023) that learning motivation is an important factor in achieving learning outcomes because it is an intrinsic factor within oneself that can motivate individuals to achieve the expected goal, namely effective learning outcomes. The application of standing boards in the learning process can increase students' enthusiasm for learning, thereby improving their learning motivation.

The learning process appears more active and motivating for students because they feel more comfortable, confident, and able to grasp the material more easily with the integration of the standing board. Students are more open to expressing themselves and learning in various ways. Students appear more confident in answering questions and discussing with their peers. (Hafizah & Ambiyar, 2021) students with high self-confidence tend to be more active in class, while those with low self-confidence tend to be more passive. There were several obstacles at the beginning of the implementation of standing board media integration, one of which was that students could not scan themselves because they were not allowed to bring cell phones. However, this problem could be overcome by using a projector and then scanning the QR code from one cell phone.

3.2. Improving Student Learning Outcomes in Science Education in Elementary Schools Through the Use of Standing Boards

The increase in student activity can be seen from the results of the student activity observation sheet. The following is the result of student activity observation in a Figure 2 and Figure 3:

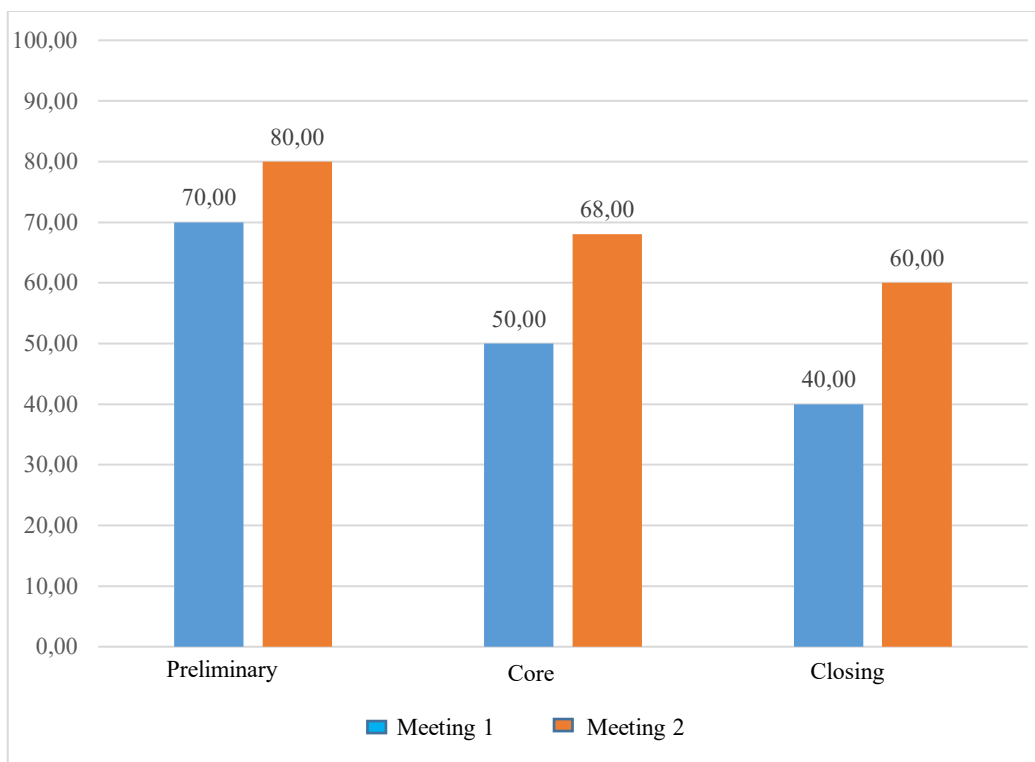


Figure 2. Graph of Student Activity Observation Results Cycle I

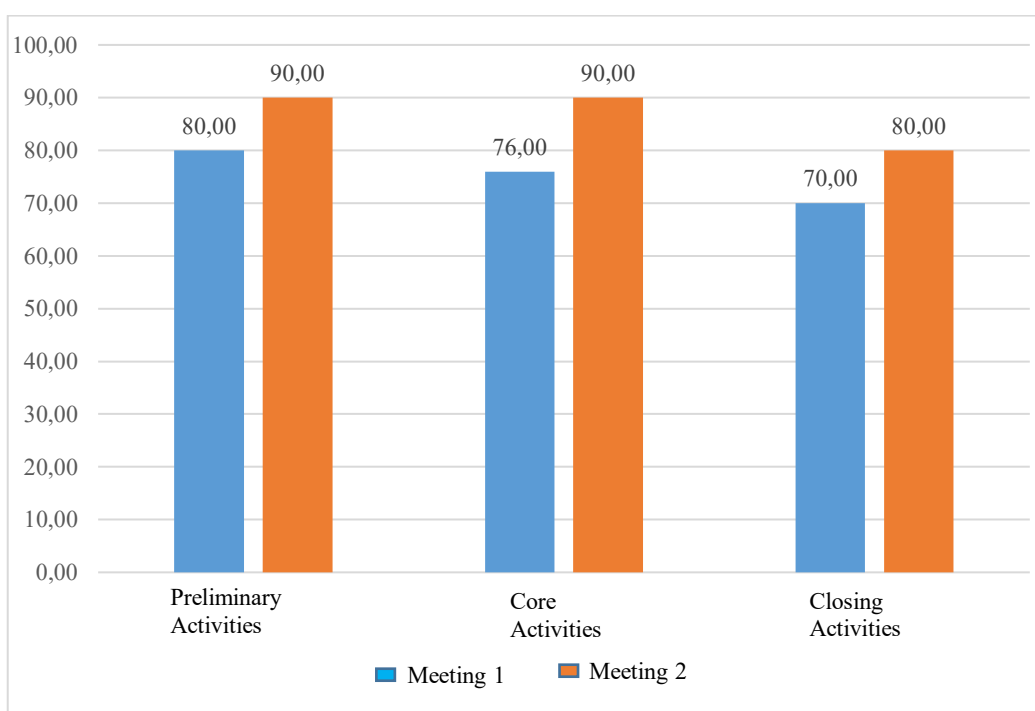


Figure 3. Graph of Student Observation Results for Cycle II

Figures 2 and 3 show the development of student learning activities in each meeting, both in cycle I and cycle II, which consistently improved. This improvement can be seen from the graph, which illustrates positive developments in every aspect of learning activities. This shows that the learning process became more effective over time. This improvement cannot be separated from the role of the standing board media integration used during the learning process. The use of this media has proven effective in capturing students' attention, facilitating understanding of the material, and enhancing their active engagement during the learning process. With more concrete and interactive media, students become more focused, enthusiastic, and interested in participating in each stage of the learning activities. Therefore, it can be concluded that the integration of standing board media positively contributes to improving the quality of the teaching and learning process, both in terms of conceptual understanding and student learning activities in Figure 4.

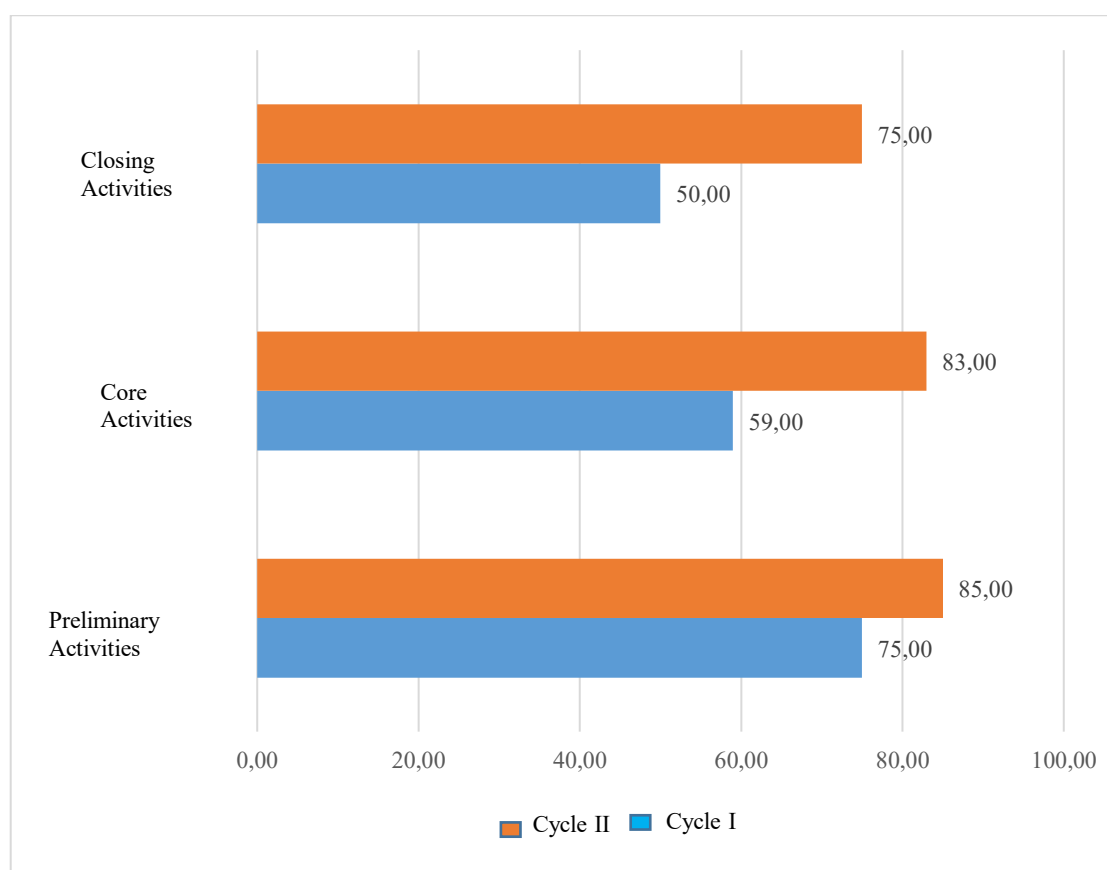


Figure 4. Summary Chart of Student Activity Observation Results for Cycle I and Cycle II

Figure 4 shows a summary graph of the results of student activity observations in cycle I and cycle II. The graph presents data in the form of averages calculated from two meetings in each cycle, providing a comprehensive overview of student activity development during the learning process. Based on the graph, there is a significant increase in Cycle II compared to Cycle I. This increase occurred after corrective actions were implemented in Cycle II, which were carried out through reflection on Cycle I. The standing board medium proved effective in enhancing student participation and active engagement, as the presentation of materials became more engaging, visual, and easier to understand. Students became more focused, enthusiastic, and active in following each stage of learning. Therefore, the graph in Figure 4 is strong evidence that the use

of standing boards is an effective measure in increasing student activity during the teaching and learning process and is able to encourage the creation of a more interactive and meaningful classroom atmosphere.

In addition to the observation results, the researcher also summarized the students' learning outcomes through tests conducted at each stage of the classroom action research. This summary of learning outcomes covers three stages: pre-cycle, cycle I, and cycle II, each aimed at measuring the extent of students' understanding of the taught material and the effectiveness of the implemented actions. In the pre-cycle stage, tests were conducted to determine the initial conditions or basic abilities of students before corrective actions were taken. Subsequently, tests in cycle I were used to measure the initial impact of the implementation of actions, while tests in cycle II aimed to assess improvements in learning outcomes after actions were refined based on reflections from the previous cycle. The summary of the test results is presented in tabular form, making it easier to compare between cycles and showing the overall progress of student learning outcomes. This data presentation also serves as a basis for assessing the success of the intervention, particularly in integrating standing boards as an effort to improve the quality of learning in the Table 1.

Table 1. Summary of Pre-Cycle, Cycle 1, and Cycle II Test Results

No	Aspect	Cycle		
		Pre-Cycle	Cycle I	Cycle II
1.	Highest Score	77	85	93
2.	Lowest Score	40	54	71
3.	Average Score Analyzing	81	84	87
4.	Average Score Concluding	55	67	80
5.	Overall Average Score	68	76	83
6.	Students Who Passed	18	22	28
7.	Percentage of Students Who Passed	56,25%	68,75%	87,50%
8.	Students Who Did Not Pass	14	10	4
9.	Percentage of Students Who Did Not Pass	43,75%	31,25%	12,50%

The data in Table 1 shows a summary of several test results analyzed, including pre-cycle, cycle I, and cycle II. The table shows several aspects, including the highest score, lowest score, average analytical score, average concluding score, overall average score, number of students who passed, percentage of students who passed, students who did not pass, and percentage of students who did not pass.

The main issue is that the initial condition shows that students are predominantly those who did not pass or have scores below the minimum passing grade. The issue of students not meeting the minimum competency standard was successfully addressed through the implementation of standing boards in the learning process. In the pre-cycle, the number of students who met the minimum competency standard was only 56.25%, increasing to 68.75% in Cycle I after the intervention was implemented, and further increasing to 87.50% in Cycle II.

The improvements observed in the above aspects were due to the integration of standing boards in classroom learning. This is in line with the opinion (Kustandi et al., 2021) that the use of visual media can facilitate student understanding, strengthen memory, and attract students'

attention and interest. The improvement in learning outcomes was proven by the improved test results in each cycle. The results of cycle II had already reached the success indicator, so the research was stopped at cycle II.

The results of the study indicate that the use of standing boards in science learning significantly improves the learning outcomes of sixth-grade elementary school students. This can be seen from the increase in the average score and percentage of student learning completeness from cycle I to cycle II. Theoretically, standing boards serve as visual and interactive media that can attract attention and improve student focus in learning. According to (Kustandi et al., 2021), the use of visual media can help clarify the delivery of material, strengthen memory, and increase student motivation in the learning process. In science learning, which often contains abstract concepts, the presence of visual media such as standing boards bridges students' understanding of the material so that it is easier to understand and remember. In addition, standing boards encourage active student engagement in the learning process. Students are not just passive listeners, but also engage in activities such as observing images, scanning QR codes, and discussing information in groups. According to (Hafizah & Ambiyar, 2021), active participation has a positive effect on improving learning outcomes because students are more cognitively and affectively involved. These results are in line with the research by (Winangsih & Harahap, 2023), which shows that visual media can increase student interaction with the material. These findings are also consistent with the research by (Saofah et al., 2025) on Smart Box media, which has been proven to improve learning outcomes through interactive learning. Thus, the improvement in student learning outcomes can be explained by the ability of standing boards to create an interesting and enjoyable learning atmosphere that encourages active student participation. This medium helps students understand science concepts more concretely, which has an impact on improving learning achievement. Therefore, the use of standing boards is highly relevant for science learning in elementary schools.

4. CONCLUSION

This classroom action research was conducted at Lembursitu State Elementary School. The research was carried out in two cycles, each cycle consisting of two meetings. Based on the results of this study, it can be seen that the integration of standing boards in learning can help in active learning activities and in improving student learning outcomes in elementary schools. The improvement in learning outcomes through the integration of standing board media was proven by the results of tests given to students at the end of each cycle. The improvement was evident from the test results, which showed an increase from each cycle. In cycle I, only 22 students or 68.75% of 32 students completed the test. In Cycle II, the number of students who passed increased to 28 students or 87.50% of 32 students. Additionally, the overall average score of students also increased, from 76 in Cycle I to 83 in Cycle II. Some of the data results from this study indicate that the integration of standing board media in learning can improve student learning outcomes in elementary schools.

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