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EFFORTS TO IMPROVE READING ABILITY AND LEARNING OUTCOMES THROUGH INTERACTIVE MULTIMEDIA IN ELEMENTARY SCHOOL

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Abstract

This research is motivated by the low reading ability and Indonesian language learning outcomes of second-grade students at SDN Glonggong 04. The main problems include students' difficulties in reading comprehension, low interest in reading due to the impact of post-pandemic learning loss, and learning methods that are still conventional and lack variety. This research aims to improve reading ability and learning outcomes through the application of interactive multimedia. The method used is Classroom Action Research (CAR), which is implemented in two cycles. Each cycle consists of planning, action implementation, observation, and reflection. The research subjects were 20 second-grade students at SDN Glonggong 04. Data were collected through testing, observation, interviews, and documentation techniques, then analyzed descriptively, quantitatively and qualitatively. The results of the study showed a significant increase in each cycle. In the pre-cycle conditions, learning completeness only reached 30%. After the application of interactive multimedia in Cycle I, the percentage of completeness increased to 60% with an average score of 71.45. The most drastic increase occurred in Cycle II, where all students (100%) achieved the Minimum Completion Criteria (KKM) with an average score increasing to 76.8. In addition to cognitive aspects, students' learning activities and motivation also experienced positive reinforcement during the learning process. Based on these findings, it can be concluded that the use of interactive multimedia is effective in improving reading skills and Indonesian language learning outcomes in second-grade students at SDN Glonggong 04.
Keywords: *Interactive multimedia, Reading ability, Classroom Action Research (CAR), Indonesian language learning, Primary education*

INTRODUCTION

Modern education today demands not only academic intelligence but also emphasizes the development of students' spiritual and social attitudes and skills. In the context of Indonesian language learning, there are four language skills: listening, speaking, reading, and writing. These four skills cannot stand alone but are interconnected (Azizah et al., 2023). Each of these skills is closely related to the thought processes that underlie language. A person's language reflects their thoughts. The more skilled a person is at language, the brighter their vision becomes and the clearer their way of thinking (Abni et al., 2024).

Reading skills are a crucial foundation because they are the primary means for students to acquire information, understand meaning, and broaden their horizons. However, in reality, second-grade students at SDN Glonggong 04 face serious literacy challenges, with 57.52% of students failing to meet the minimum completion criteria (KKM). This low reading ability is driven by the effects of *learning loss* following the COVID-19 pandemic and the use of conventional learning methods that tend to be monotonous (Aji, 2020; Gogahu & Prasetyo, 2020).

The interactive multimedia experiment in this study was designed to expand knowledge about adaptive pedagogical strategies in the digital era. Interactive multimedia that integrates audio, text, animation, and video is expected to transform abstract language concepts into more concrete ones. Dama et al. (2025) define *interactive multimedia* as a set of learning technologies that provide opportunities for students to play an active role in controlling the learning flow, choosing the sequence of materials, and receiving direct feedback on actions taken during the learning process. This experiment aims to prove that two-way interaction in digital media can increase intrinsic motivation and overcome students' cognitive barriers in understanding reading texts. Various relevant previous research studies support this topic. Research by Fuadati (2023) shows that the application of multimedia-based digital media significantly improves elementary school students' reading comprehension.

In line with this, Arianto et al. (2024) proved that the use of interactive media equipped with visual and auditory elements can increase the average reading ability score from 68.2 to 83.6. Furthermore, the findings of Almasari et al. (2025) confirmed that external factors such as the use of innovative learning media have a significant positive influence on the effectiveness of the learning process in the classroom. By integrating these findings, this study seeks to provide practical solutions to improve the quality of basic literacy in elementary schools. Reviewers to assess submitted manuscripts.

Although previous studies have demonstrated that innovative learning media, such as educational games and visual-based tools, can enhance students' language skills, most research has predominantly focused on digital or interactive multimedia. Studies specifically examining the use of simple game-based media such as translation dice in language learning, particularly at the elementary school level, remain limited.

Furthermore, prior research tends to emphasize cognitive learning outcomes, while aspects such as student engagement, motivation, and active participation in the learning process have not been comprehensively explored. In fact, translation dice media has the potential to create a fun, interactive, and contextual learning environment through play-based activities. Therefore, this study aims to fill this gap by investigating the effectiveness of translation dice media in improving language skills while also enhancing students' engagement and learning motivation.

Based on the description of the problem background above, the research question is formulated as follows: How can the implementation of Indonesian language learning improve reading skills and learning outcomes using interactive multimedia for second-grade students at SDN Glonggong 04? This study aims to fill this gap by implementing interactive multimedia to improve reading skills and learning outcomes, and to enhance

students' motivation and active participation in the learning process. This research contributes by providing an integrative model that combines pedagogical intervention, digital media utilization, and reflective teaching practices in the context of early-grade literacy development.

METHOD

The method used should be accompanied by references; relevant modifications should be explained. The procedure and data analysis techniques should be emphasized in the literature review article. The research stages should be clearly stated.

This research uses a qualitative and quantitative approach with the Classroom Action Research (CAR) type. The research procedure follows the spiral model from Kemmis and McTaggart, which consists of four main stages in each cycle: (1) Planning, (2) Acting, (3) Observing, and (4) Reflecting. The use of CAR aims to improve the quality of the process and results of reading learning and Indonesian language learning outcomes in a sustainable manner.

The research was conducted at SDN Glonggong 04 Madiun Resident, East Java, Indonesia. The research subjects were 20 second-grade students in the even semester of the 2024/2025 academic year. Data were collected through several instruments to ensure the validity of the findings. A test was used to measure students' reading ability and cognitive learning outcomes at the end of each cycle.Observations were conducted to monitor teacher and student activities during the learning process using interactive multimedia. Interviews were used to obtain in-depth information regarding learning obstacles and student responses. Documentation includes photos of learning activities and teaching modules as physical evidence of the implementation of actions.

This research uses a Classroom Action Research (CAR) design which is implemented in two cycles, where each cycle consists of the planning, action implementation, observation, and reflection stages (Arikunto, 2021). This CAR design was implemented to improve the reading skills and Indonesian language learning outcomes of second-grade students at SDN Glonggong 04 through the continuous use of interactive multimedia. The following Figure 1 is an overview of the classroom action research design using a learning model that is appropriate to the goal of improving students' reading skills.

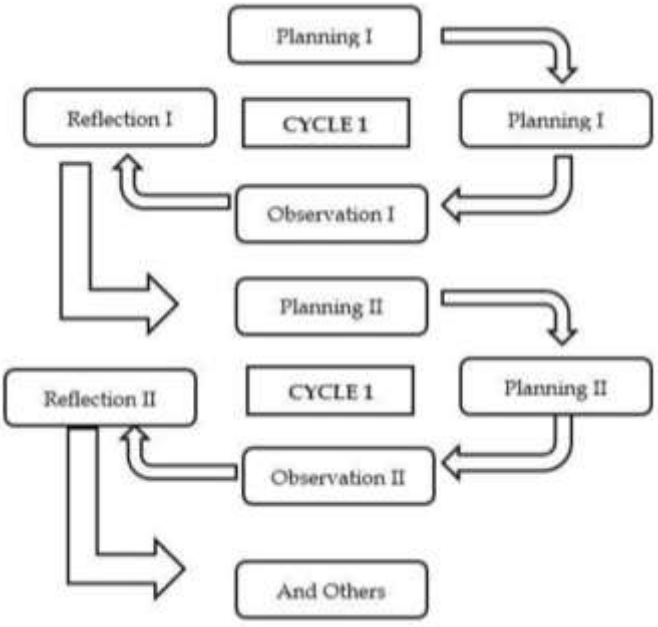

Figure 1. Class action research flow

In the planning stage, researchers compiled Teaching Modules, prepared interactive multimedia-based teaching materials, and designed assessment instruments for students' reading ability and learning outcomes. The implementation phase of the action was carried out through the use of interactive multimedia in reading learning activities, such as interactive visual displays, digital reading exercises, and text comprehension activities through media that were interesting for second-grade students. Next, the observation phase was carried out to record the activeness, involvement, and development of students' reading skills during the learning process. In Table 1, the reflection phase was carried out to evaluate the results of the actions in each cycle, identify any obstacles that emerged, and determine improvements that needed to be made in the next cycle.

Table 1. Student Performance Indicators

Aspect	Success Indicators	Target / Criteria
Reading Ability	Students can read texts with accurate pronunciation, intonation, and fluency. They can answer questions based on the text they read. They demonstrate understanding of the content of the text (mentioning characters, plot, theme, and message).	≥ 80% of students achieve KKM (e.g. 70) on the reading test.
Indonesian Language Learning Outcomes	The average class score increased from pre-action to post-action. Students can solve reading comprehension questions correctly.	The class average increased by at least 10 points from pre-action.
Learning Activities	Active students demonstrated interest when using interactive multimedia. They were willing to try out the interactive features within the media. They were able to complete assignments within the allotted time.	≥ 80% of students are active during learning.
Motivation and Interest in Learning	Students show enthusiasm, attention, and interest in the material presented through multimedia.	≥ 80% of students showed a positive response based on observation/interview results.

Data were analyzed using two main methods according to the theory of Miles, Huberman, and Saldaña (2019): Quantitative Analysis using descriptive statistics to calculate the class average score and the percentage of classical learning completion. The success criteria are set if at least 70% of students achieve the Minimum Completion Criteria (KKM) score ≥ 70. Qualitative analysis is conducted through the stages of data reduction, data presentation, and concluding to describe changes in behavior and learning activities.

RESULT

The results should be presented in the same part, clearly and briefly. The research results could be supplemented with tables, figures, or graphs (separate writing terms) to clarify. Avoid presenting similar data in a separate table. The analysis should address the stated gap. The qualitative data, e.g., interview results, should be discussed in paragraphs. The references contained in the introduction should not be rewritten in the discussion. A comparison to the previous studies should be presented.

This research was conducted in three main stages, namely pre-cycle, Cycle I, and Cycle II, to measure the improvement in reading ability and learning outcomes of class II students at SDN Glonggong 04.

Pre-Cycle Conditions

In the pre-cycle phase, researchers conducted initial observations of the Indonesian language learning process in second-grade students at SDN Glonggong 04. Based on the observations, it was found that students' reading abilities were still highly diverse, and the majority had not yet demonstrated adequate reading fluency. Learning tended to be

conventional, with teachers relying solely on textbooks without using supporting media or innovative learning strategies. This situation resulted in students lacking motivation, easily becoming bored, and experiencing difficulty understanding the reading material.
Furthermore, students' reading comprehension skills were also low. Many students were unable to identify basic information in texts, such as characters, places, and events, resulting in low learning outcomes. Based on preliminary data, out of 20 students, only 6 met the Minimum Completion Criteria (KKM), while 14 others had not yet achieved the minimum completion criteria. This indicates that students' reading and comprehension skills still require more effective and engaging learning interventions, one of which is the application of interactive multimedia.

Table 2. Indonesian Language Learning Outcomes of Grade II Students of SDN Glonggong 04 (Pre-Cycle)

Completeness	Frequency	Percentage
Completed	6	30%
Not Completed	14	70%
Amount	20	100%
The highest score	80	
Lowest value	45	
Average value	58.47	

Based on initial observations, students' reading ability is still relatively low. Of the 20 students, only 30% (6 students) achieved the Minimum Completion Criteria (KKM), with a class average score of 58.47. Students tend to become bored because learning is still conventional and lacks varied media.

Cycle I

Cycle I was implemented in two meetings, on October 14, 2025, and October 22, 2025. The cycle stages consisted of planning, action implementation, observation, and reflection. The main focus of the actions in Cycle I was the use of interactive multimedia to improve reading skills and Indonesian language learning outcomes for second-grade students.

Cycle I Planning

In the planning stage, the researcher conducted several activities as a basis for implementing the actions, namely: a. Developing Teaching Modules in accordance with the Learning Outcomes (CP) and Learning Objectives (TP) of the Independent Curriculum. b. Arranging student seating to facilitate group work and reading activities. c. Preparing observation sheets for teachers and students. d. Providing learning media in the form of interactive multimedia, such as children's story videos, animated images, audio recordings of reading material, and quizzes. e. Developing evaluation sheets (LKPD) based on the reading material. f. Preparing a camera for documenting learning activities.

Figure 2. Form of interactive multimedia

Implementation of Actions

Learning began at 7:30 a.m. Western Indonesian Time. The teacher opened the lesson with a prayer, checked attendance, and played a song to motivate students to be enthusiastic. The teacher provides stimulation in the form of questions about students' experiences in reading stories through videos, television, or the surrounding environment. The questions are given to build curiosity and motivate students to learn to read using interactive multimedia.

Figure 3. Learning activity with interactive multimedia

In this activity, learning begins with a Problem Statement (Problem Identification). The teacher explains the material for reading a simple story through interactive multimedia. Students are allowed to ask questions if there is material that is not yet understood. Data Collection (Data Collection): The teacher distributes reading LKPD. b) Students observe the interactive multimedia display in the form of a story video, animated images, and audio reading. Students identify important information from the story such as characters, plot, and content of the reading. In the Data Processing stage, students process the information obtained from the interactive multimedia. b) Students reread the displayed part of the story and note difficult words, the content of the story, and answers to questions in the LKPD. In the Verification stage, students present the results of their group work, conveying the story in their own words, and the teacher provides reinforcement and clarification if there are any misunderstandings. Next, the teacher explains the learning

objectives, the material to be covered, and the steps for the activity. In the closing activity, the teacher and students generalize (conclude) based on the learning outcomes through interactive multimedia. The teacher provides feedback, a brief reflection, and concludes the lesson with a greeting.

Observation

In Cycle I, observations were made of the teacher and student activities during the Indonesian language learning process using interactive multimedia. The collaborating teacher conducted observations, while the researcher acted as the instructor.

Table 3. Result of the observation

No.	Observed Aspects	Score
1	Students' readiness in preparing learning tools and materials	3
2	Students understand the learning objectives	3
3	Students listen to and pay attention to the teacher's explanation	4
4	Students are skilled in using interactive multimedia	3
5	Students' attitudes during the learning process	3
6	Students actively ask questions	2
7	Students' activeness in learning activities	3
8	Students complete reading exercises well	3
9	Students' cooperation in small groups	3
10	Students' ability to complete reading tasks	3
	Total	30
	Average	3,0

The use of interactive multimedia was observed through student engagement, active reading, attention to visual displays, and ability to follow instructions displayed on the media. These observations aimed to determine the extent to which the use of interactive multimedia improved students' reading skills and learning outcomes. All activities were recorded on the teacher's and students' observation sheets. The recapitulation results indicate that teacher activity is satisfactory, but student activity still needs improvement, particularly in the use of multimedia and active reading activities.

Reflection

Based on the observations, several areas that need improvement in Cycle I include: student readiness to participate in learning is still low; some students are not focused when interactive multimedia is first used; student order needs to be improved, especially during group reading activities; some students are not yet accustomed to using interactive multimedia, so they still appear confused; teachers need to encourage students to ask and answer questions more frequently to increase participation; and teachers need to provide praise and positive reinforcement to active students to increase learning motivation.

Cycle II

Cycle II was implemented in two sessions, on November 11, 2025, and November 19, 2025. Cycle II was implemented after reflecting on the results of Cycle I. The stages consisted of planning, action implementation, observation, and reflection. The main difference between Cycle I and Cycle II was the improvement in the use of interactive multimedia as the learning media. In Cycle I, the interactive multimedia was introduced to students to support basic reading activities and Indonesian language learning. However, several weaknesses were identified, such as limited student interaction, insufficient

practice activities, and students' difficulty in understanding some materials presented in the media.

Therefore, in Cycle II, the media was revised and optimized by adding more attractive visual elements, clearer audio instructions, interactive reading exercises, animations, and educational games to increase students' engagement and comprehension. The teacher also provided more guidance in using the multimedia during the learning process. These improvements were expected to enhance students' reading skills and learning outcomes more effectively.

Planning

In the planning stage of Cycle II, the researcher made several improvements based on the reflections from Cycle I, namely: developing a revised module, focusing on increasing student engagement and using more varied multimedia; arranging seating to facilitate more conducive interaction between students; preparing more engaging interactive multimedia, such as shorter videos, clearer animations, and slower audio reading; preparing student worksheets (LKPD) with adjusted difficulty levels; preparing observation sheets for teachers and students; providing technical explanations of multimedia use to students to avoid confusion as in Cycle I; and preparing learning documentation using a camera.

Figure 4. Form of interactive multimedia

Implementation of Actions

Learning began at 7:30 a.m. Western Indonesian Time. In the opening activity, the teacher invites students to pray and checks attendance. Next, the teacher provides an apperception through an engaging visual presentation. This motivates students to be more active and confident. It provides an overview of the learning objectives to be achieved. In the core activity, the steps are: Discovery Learning assisted by interactive multimedia; Problem Statement (Problem Identification): The teacher presents a new story through multimedia and asks students to find the main idea of the reading material; Data Collection: Students observe the video story and animation shown; follow audio instructions for reading together; identify characters, plot, and moral of the story.

Figure 5. Learning activity with interactive multimedia

The next step, Data Processing, includes: students discussing in small groups; students rewriting the story content in their own words; and completing student worksheets based on the multimedia presentation.
In the Verification stage, students take turns presenting their group answers. The teacher provides clarification, guidance, and reinforcement. c. Closing Activities: The teacher: 1) Invites students to conclude the learning. 2) Provides feedback. 3) Conveys the values of discipline and responsibility in reading. 4) Closes the lesson with a greeting.

Observation

In Cycle II, observations were conducted on the ongoing learning process. Based on the observations made by the observer, an average score of 4.2 was obtained, categorized as satisfactory. This score indicates that most of the observed aspects, such as student readiness, activeness, use of interactive multimedia, and ability to complete reading assignments, were implemented well. Overall, the results of the student observations, consisting of 10 assessment aspects, indicated an increase in the quality of student engagement during the learning process.
In Cycle II, observations were conducted on the learning process carried out by the teacher. Based on the observations made by the observer, an average score of 4.8 was obtained, categorized as satisfactory. This score indicates that the teacher implemented the lesson very well, starting from apperception, conveying learning objectives, using interactive multimedia, providing feedback, and closing the lesson. Overall, the 12 assessment aspects observed indicated that the teacher was able to manage teaching and learning activities optimally.

Table 4. Result of the observation

No.	Observed Aspects	Score
1	Students' readiness in preparing learning tools and materials	5
2	Students understand the learning objectives	5
3	Students listen to and pay attention to the teacher's explanation	4
4	Students are skilled in using interactive multimedia	5
5	Students' attitudes during the learning process	5
6	Students actively ask questions	4
7	Students' activeness in learning activities	5
8	Students complete reading exercises well	5
9	Students' cooperation in small groups	4

10	Students' ability to complete reading tasks	5
	Total	47
	Average	4,7

Based on the recapitulation of observation results in Cycle II, it appears that both teacher performance and student activities were categorized as satisfactory. The teacher's observation received a score of 47 with an average of 4.7, indicating that the teacher had executed all stages of the lesson very well, from apperception, conveying objectives, classroom management, utilizing interactive multimedia, to the final assessment.
This indicates that students demonstrated active engagement in the lesson, paid attention to the teacher's explanations, were able to work collaboratively in groups, and completed reading assignments. Overall, the results of this recapitulation indicate that the learning process in Cycle II was optimal and effective, both for the teacher and the students. These results also demonstrate an improvement in the quality of learning compared to the previous cycle. This table shows that learning in Cycle II was more effective in improving student understanding and achievement.
d. Reflection
The reflection results showed a significant improvement compared to Cycle I. Student readiness increased, and they were more focused from the beginning of the lesson (63). At the same time, class order was well maintained because students followed the teacher's instructions in a disciplined manner. The use of multimedia became more optimal so that students no longer felt confused, and their activeness in asking and answering questions increased. Student learning motivation was also higher, especially because the teacher consistently gave praise and reinforcement.
The implementation of interactive multimedia in Cycle II showed a very significant improvement compared to Cycle I, as shown in the graph. In Cycle I, only 12 students (60%) achieved learning mastery, while 8 students (40%) remained incomplete. This situation changed drastically in Cycle II, where all 20 students (100%) achieved learning mastery. This improvement not only demonstrates the effectiveness of the media used but also demonstrates that students were increasingly helped in understanding the material through visualizations, animations, and interactive exercises. Furthermore, students became more focused, more easily followed the learning flow, and were no longer confused when using multimedia.

Table 2. Percentage of Learning Completion, Average Student Score, and Average Teacher and Student Observations Between Cycle I and Cycle II

Cycle	Average Student Score	Percentage of Completion	Observation Score			
			Teacher	Category	Learners	Category
I	71.45	60%	72	Satisfying	30	Satisfying
II	76.80	100%	78	Satisfying	42	Satisfying

Based on the table, it can be seen that the implementation of interactive multimedia learning in Cycle I has had a positive impact on reading skills and learning outcomes, which were then improved more optimally in Cycle II. Student engagement, reading comprehension, and learning completeness increased significantly, while teacher performance in managing learning and utilizing multimedia remained in the satisfactory category. This indicates that interactive multimedia-based learning strategies are effective in improving reading skills and Indonesian language learning outcomes of second-grade students.
The application of interactive multimedia in Cycle II showed a very significant improvement compared to Cycle I, as seen in the graph.

In Cycle I, only 12 students (60%) achieved learning completion, while 8 students (40%) had not yet completed it. This situation changed drastically in Cycle II, where all 20 students (100%) successfully achieved learning completion. This improvement not only demonstrates the effectiveness of the media used but also demonstrates that students were increasingly helped in understanding the material through visualizations, animations, and interactive exercises. Furthermore, students became more focused, found it easier to follow the learning flow, and were no longer confused when using multimedia.

The positive response from students was evident in their increased activeness in asking and answering questions, as well as their higher learning motivation due to feedback and reinforcement from the teacher. Thus, the use of interactive multimedia in Cycle II has been proven to improve overall learning outcomes. This improvement in the quality of learning demonstrates that interactive multimedia can improve students' reading skills and overall learning outcomes. Interactive media not only makes it easier for students to understand text content, but also fosters motivation, interest, and active participation in learning. Students who previously struggled with reading and comprehension can now read more fluently, identify important information in stories, and reconstruct the story content in their own words. This demonstrates the success of interactive multimedia learning in improving students' literacy skills and academic achievement.

DISCUSSION

The findings of this study indicate that the use of translation dice media has a positive impact on improving students' language skills. The improvement is evident not only in cognitive aspects, such as vocabulary translation and sentence comprehension, but also in affective and psychomotor domains, including student engagement, participation, and confidence during the learning process. This suggests that game-based learning media can create a more meaningful and enjoyable learning experience. The use of multimedia helps students understand abstract language concepts more concretely through visualizations of text, images, sound, and animation. By combining visual and auditory elements, students can understand sentence structure, word meaning, and reading context more effectively. This media also makes it easier for teachers to convey material that is difficult to explain verbally (Pitoyo & Lailiyah, 2024).

These findings are consistent with constructivist learning theory, which emphasizes that learners actively construct knowledge through direct experience. In this context, translation dice provide opportunities for students to learn through play while engaging in cognitive processing, making language acquisition more effective (Islamiah et al., 2022; Murtafiah et al., 2021). Additionally, incorporating game elements has been shown to enhance students' intrinsic motivation, as they feel both challenged and entertained during learning activities (Erliana, 2011).

This study also supports previous research indicating that game-based learning media can improve learning outcomes and student engagement (Chen & Tu, 2021; Streit & Hadi, 2018). However, this research extends prior studies by demonstrating that simple, low-cost media such as translation dice can be as effective as digital-based tools. Therefore,

teachers are provided with practical and accessible alternatives for implementing interactive learning strategies in the classroom.

Furthermore, the improvement observed across learning cycles suggests that the effectiveness of the media is closely related to instructional strategies. Enhancements in classroom management, clearer instructions, and consistent reinforcement contributed significantly to better learning outcomes (Dalle, 2019; Lu, 2021). This highlights that the success of instructional media depends not only on the tool itself but also on how the teacher pedagogically implements it.

In conclusion, the translation dice function not only as a learning aid but also as a medium to foster active interaction, increase motivation, and create a more participatory learning environment. These findings reinforce the importance of integrating game-based media in language learning at the elementary school level.

CONCLUSION

Based on the results of classroom action research (PTK) carried out in two cycles at SDN Glonggong 04, it can be concluded that the use of interactive multimedia has been proven to improve Indonesian language learning outcomes for second-grade students significantly. This is evidenced by an increase in classical mastery from only 30% in the pre-cycle to 60% in Cycle I, and reaching 100% perfect mastery at the end of Cycle II, with a class average score of 76.80. Improved Reading Skills: The application of interactive multimedia that combines text, audio, and visual elements helps students overcome reading difficulties and better understand text content. Students become more fluent in reading aloud and can identify characters and moral messages in stories. The learning process becomes more active, creative and fun. Teacher and student activity observation scores consistently increased until they reached the "Satisfactory" category at the end of the action cycle.

This research has several limitations. First, the study was conducted only in one class, namely Grade II students of SDN Glonggong 04, so the results cannot be generalized to students in other schools or grade levels. Second, the duration of the research was relatively short because it was carried out only in two cycles, which may not fully show the long-term impact of interactive multimedia on students' reading ability and Indonesian language learning outcomes. Third, the availability of technological facilities and students' varying abilities in using multimedia affected the implementation of the learning process. In addition, the researcher also acted as the teacher during the study, which may have influenced the objectivity of observations and assessments. Therefore, further research with a larger sample, longer duration, and more varied learning media is recommended to obtain more comprehensive results.

Conflict of Interest

All authors declare that they have no conflicts of interest.

AI Disclosure Statement

This manuscript was partially supported by the use of ChatGPT (OpenAI) for language editing and text improvement. All outputs generated by the AI tool were carefully reviewed and verified by the authors. The authors assume full responsibility for the content.

Author Contribution

Conceptualization: Binti Halimatus Sholikhah; methodology: Endang Sri Maruti; investigation: Vivi Rulviana; writing—original draft preparation: Binti Halimatus Sholikhah; writing—review and editing: Endang Sri Maruti.

Data Availability

The datasets generated and analyzed during this study are not publicly available due to the inclusion of participants' personal information. However, they are available from the corresponding author upon reasonable request and with appropriate ethical approval.

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