

The Effectiveness of Child-Friendly Media on the Reading Interest and Ability of Elementary School Students

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Abstract: This study examined the effectiveness of a child-friendly interactive magnetic board in improving elementary students' reading interest and early reading skills in regular and inclusive classrooms. A convergent parallel mixed-methods design was used to integrate quantitative and qualitative evidence. Participants were 12 students selected purposively from two schools: six Grade-1 students from SD Negeri Tlogowungu 02 (regular setting) and six Grade-2 students from SD Negeri Trangkil 06 (inclusive setting with diverse learning needs). Reading interest was assessed through structured observations (attention, enthusiasm, verbal response, participation), while reading skills were measured using a teacher-administered early literacy test (letter recognition, word decoding, and simple sentence reading). Quantitatively, median reading-skill scores increased from 52.0 to 78.5 in the regular class and from 45.0 to 70.0 in the inclusive class after two intervention sessions; Wilcoxon signed-rank analysis indicated improvement in both groups ($p = 0.031$). Qualitative findings showed higher engagement, longer on-task behavior, and increased willingness to read aloud. The interactive magnetic board functioned as a child-friendly multisensory medium (visual, auditory, tactile) that supported motivation and literacy participation, including among students with learning difficulties. The study concludes that the media is a feasible and inclusive instructional tool for early literacy instruction, while also noting the need for larger samples and longer intervention periods in future studies

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INTRODUCTION

Primary education plays a crucial role in the development of children's cognitive and social abilities, particularly in reading skills, which are the primary foundation for their future academic success. Therefore, creating an engaging and effective learning environment is of utmost importance. One way to enhance children's reading skills is through the use of child-friendly learning media. This media not only focuses on delivering information unidirectionally but also creates an interactive and enjoyable learning experience, which is vital in encouraging student interest and motivation to learn. One media that has proven effective in improving reading skills is the magnetic board, which is a type of interactive media that can support child-friendly learning, especially for elementary school students.

Child-friendly media such as the magnetic board can become an engaging learning tool, not only for students with good reading abilities but also for those requiring more specialized learning approaches, such as children with special needs. The use of magnetic boards allows children to learn visually and kinesthetically, providing a more comprehensive and enjoyable learning experience. This is important because research shows that children's interest in learning is greatly influenced by the methods used in the teaching process. Therefore, learning media that is not only informative but also enjoyable becomes key to increasing student engagement in reading instruction.

The use of technology in education, as researched by Annetta et al. (2024), shows that immersive technology can improve students' reading comprehension and vocabulary. In their study, it was found that the use of immersive spatial computing technology in science learning in elementary schools can enhance

reading interest and language skills. This technology gives students the opportunity to interact directly with learning materials through engaging visualization, which can improve their understanding of difficult concepts. This immersive learning experience strongly supports the development of reading skills, especially for students with visual or kinesthetic learning styles, and can be an effective choice to implement in classes with diverse student needs.

Not only digital technology, simple media such as magnetic boards can also have a significant impact on reading instruction. Magnetic boards allow students to learn to read in a more active way and engage directly with the material, for example by arranging words or sentences using magnetic letter pieces. This supports hands-on practice-based learning, which has proven more effective in improving the reading skills of elementary school-aged children. Research by Busch et al. (2023) shows that media supporting student emotional and cognitive engagement can enhance their understanding of learning materials. Media like magnetic boards provide opportunities for children to interact physically with the material, encouraging them to be more focused and motivated in learning.

Furthermore, the use of interactive media can also help students overcome learning challenges they face, especially in high-pressure situations like the COVID-19 pandemic. During the pandemic, many students struggled to maintain their reading skills due to distance learning. Domingue et al. (2022) in their research found that the COVID-19 pandemic caused a significant decline in students' reading fluency, particularly among children hindered by online learning. Therefore, innovative solutions are needed to address this problem, one of which is using interactive media that can encourage direct student engagement, both physically and emotionally. The magnetic board as an interactive medium can be one effective alternative to support reading skills amidst the distance learning challenges faced by many students.

Additionally, research by Erbeli et al. (2021) also shows a strong relationship between the development of reading ability and mathematical skills in children. Integrating interactive media like magnetic boards in learning can not only enhance reading skills but also help the development of other skills, such as numeracy and mathematical logic. This media encourages students to think more creatively and analytically, which is important in holistic learning. Magnetic boards provide opportunities for children to practice reading skills while arranging letters and words, which in turn helps them understand the relationship between symbols and meaning.

In addition to its benefits in improving reading skills, magnetic boards also have the potential for use in interventions for children experiencing reading difficulties, including those with special needs. Fischer (2023) in his research on dyslexia prevention suggests using learning media that facilitates visual and kinesthetic understanding, such as magnetic boards, to help children with dyslexia understand the relationship between letters and sounds more clearly. This media can also be used to stimulate reading interest in children who tend to be disinterested in traditional reading instruction, by providing them with a more enjoyable way to learn.

Research by Goldfeld et al. (2022) also supports the importance of using interactive media in classroom instruction. They investigated how classroom-based interventions using learning media like magnetic boards can improve children's reading abilities. This research shows that child-friendly media can enhance reading skills across the entire class, not only for students who already have good reading abilities but also for those requiring special attention. Child-friendly media such as magnetic boards can create an inclusive and supportive environment for all students to develop.

Despite the growing evidence on interactive and multisensory learning, empirical classroom-based studies on simple, non-digital magnetic-board media for improving both reading interest and reading skills in regular and inclusive elementary classrooms in Indonesia remain limited. This study addresses that gap by examining a practical child-friendly intervention that can be implemented by teachers in resource-limited settings.

This study aimed to examine the effectiveness of interactive magnetic-board media in improving elementary students' reading interest and early reading skills. The study was guided by three questions: (1) How does the magnetic-board intervention influence students' reading interest and classroom engagement? (2) To what extent does the intervention improve students' early reading skills in regular and inclusive classrooms? (3) How do qualitative findings explain the observed quantitative changes?

METHOD

Research Design.

This study used a convergent parallel mixed-methods design. Quantitative and qualitative data were collected during the same intervention period, analyzed separately, and interpreted together. This design was selected to provide a more comprehensive explanation of effectiveness by combining score-based evidence (reading outcomes) and process-based evidence (engagement and responses during instruction).

Participants and Setting.

Participants were 12 students selected through purposive sampling and divided into two groups. Group A consisted of six Grade-1 students from SD Negeri Tlogowungu 02 (regular classroom), including five boys and one girl. Group B consisted of six Grade-2 students from SD Negeri Trangkil 06 (inclusive classroom) with diverse learning profiles (e.g., hearing/speech impairment, hyperactivity/attention difficulties, general learning difficulties, and shyness). School permission and parental/guardian consent were obtained before the study.

Intervention Procedure.

The intervention was conducted in two instructional sessions in each school (approximately 60-70 minutes per session). Learning activities included: (1) motivational opening (e.g., short singing/ice-breaking), (2) introduction of lesson topic and magnetic-board media, (3) guided letter recognition and matching using magnetic letters/pictures, (4) word-building and simple sentence reading, and (5) feedback and reflection. In the inclusive class, task pacing and complexity were adjusted (e.g., fewer items per task, repeated prompts, larger visual cues, and additional teacher support).

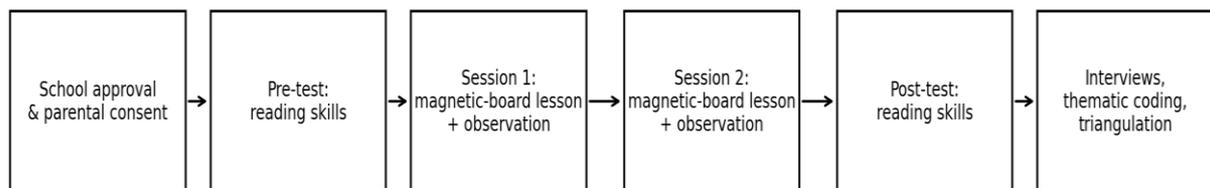


Figure 1. Research Procedure Flowchart for The Magnetic-Board Intervention Study

Instruments and Data Collection.

Qualitative data were collected through classroom observations and semi-structured interviews. A structured observation rubric was used to assess reading interest and engagement based on four indicators: attention, enthusiasm, verbal response, and participation (0-5 per indicator; total score 0-20). Semi-structured interviews with teachers and selected students were conducted after the sessions to explore enjoyment, motivation, perceived usefulness, and barriers during implementation. Quantitative data were obtained using pre-test and post-test early reading assessments (score range 0-100), covering letter recognition, word decoding, and simple sentence reading. Instrument content was reviewed by language-education experts to ensure relevance to lesson objectives. To strengthen credibility, selected observation scoring was cross-checked by a second observer and qualitative findings were triangulated with student test-score changes and classroom artifacts.

Data Analysis.

Quantitative data were analyzed using descriptive statistics (median pre-test, median post-test, and median change) and Wilcoxon signed-rank tests because of the small sample size and paired observations. Qualitative data from observations and interviews were analyzed thematically through coding, categorization, and theme refinement. Integration was performed by comparing quantitative gains with patterns of student participation and engagement to explain how the intervention worked in both classroom contexts.

RESULT AND DISCUSSION

The implementation of the interactive magnetic board in the first-grade class at SD Negeri Tlogowungu 02 showed positive results in two conducted sessions. This class consisted of six students, five boys and one girl, including four typically developing students and two inclusive students with learning difficulties that previously affected their reading interest and skills. In the first session, the interactive magnetic board using bright colors, attractive images, and tactile manipulative elements successfully captured the students' attention. Media that is visual and kinesthetic, such as a magnetic board, proves effective in increasing student engagement (Annetta, et al., 2024). The students' ability to physically attach letters and images made the learning experience more enjoyable and could increase their motivation to participate in learning (Busch, et al., 2023).

Table 1 reports median score changes for the regular and inclusive classes. At the individual level, 10 of 12 students showed measurable improvement in reading performance after the intervention, while 2 students showed limited progress and required more intensive support. In the inclusive classroom, improvement was strongest in letter recognition and guided word reading, while reading fluency gains varied depending on students' learning profiles.

Table 1. Pre-test and post-test reading-skill summary

Group	n	Pre-test Median	Post-test Median	Median Change	Wilcoxon p
Regular class (Grade 1, SDN Tlogowungu 02)	6	52.0	78.5	+26.5	0.031
Inclusive class (Grade 2, SDN Trangkil 06)	6	45.0	70.0	+25.0	0.031

Initial assessment showed that most students had low word recognition skills, with two students, especially those with learning difficulties, struggling to recognize letters and form simple words. However, by the end of the first session, students with special learning needs showed significant improvement in recognizing letters and began reading simple words. This supports findings from research showing that enjoyable and interactive media can support the development of reading skills, especially for children with learning difficulties (Fischer, 2023). Post-activity evaluations also showed measurable performance improvement, indicating the effectiveness of this media in enhancing students' reading skills.

In the second session, the level of student motivation and engagement remained high. Students showed better reading fluency and accuracy, with the students who previously showed progress continuing to develop, while other students also showed improvement in their ability to recognize and read words. Previous research shows that the use of learning media involving direct interaction, such as magnetic boards as shown di Figure 2, can improve overall reading skills, including among students with special needs (Goldfeld, et al., 2022). This media not only facilitates academic development but also creates an inclusive and enjoyable learning atmosphere.



Figure 2. Students Interacting with the Interactive Magnetic Board during the Lesson

Learning activities began with a singing session to create a cheerful and engaging atmosphere, which can increase student engagement from the start (Domingue, et al., 2022). After that, the introduction of the lesson topic and learning media was conducted, followed by instructional steps utilizing the interactive magnetic board. The high enthusiasm of students during this activity is visible in the picture showing student interaction with the provided learning media. This indicates that the magnetic board media not only plays a role in improving reading skills but also in creating a fun and immersive learning experience, as presented in Figure 2.

The interactive magnetic board is a learning medium that combines various learning elements to increase students' reading interest and reading skills, especially in the context of inclusive education. This media allows students to arrange letters or words made from magnets on a whiteboard, making the learning process more concrete and interesting. The use of multisensory media, such as a magnetic board, has proven effective in increasing student engagement, especially among those with learning difficulties. Astuti et al. (2024) state that the use of media similar to a magnetic board can improve memory and reading motivation in dyslexic students. Furthermore, media that integrates visual, auditory, and tactile elements has the potential to enrich the reading learning experience for students with special needs (Alisyafiq, et al., 2021).

This study used the Systematic Literature Review (SLR) method guided by the PRISMA 2020 framework (Page et al., 2021) to review previous research and gather information regarding the implementation of interactive magnetic boards in improving reading skills in inclusive schools in Indonesia. This methodological framework was chosen for its suitability in analyzing and synthesizing existing research on the use of magnetic board media to support literacy development, especially in the context of inclusive education.

The main factors influencing students' reading interest include literacy infrastructure, learning technology, and library availability (Mardiah, 2023). Various school literacy programs have been implemented to foster a reading culture, including interactive activities involving the use of innovative teaching methods. In the inclusive context, research shows that the use of interactive media such as magnetic boards can increase the reading interest and literacy skills of students with special needs. This is evident in the research by Aryanti, et al. (2024) which states that activities such as reading corners and training for teachers and parents can significantly improve the literacy skills of children with special needs.

This research was conducted at SD Negeri Trangkil 06, an inclusive school with diverse special needs among its students. Six second-grade students with varied learning profiles, including two students with hearing and speech impairments (deaf-mute), two students with hyperactivity, one student with learning difficulties, and one student with a shy personality, participated in this study. Initial observation showed that only two students were able to read fluently, while the other four students showed limited reading interest. To address this, the interactive magnetic board was introduced as a learning medium expected to increase student engagement and reading interest, as presented in Figure 3.



Figure 3. Students at SD Negeri Trangkil 06 Enthusiastically Using the Interactive Magnetic Board

In the first and second sessions conducted, the interactive magnetic board proved very effective in attracting student attention. With colorful visuals, tactile experience, and direct interaction, students could be more actively involved in learning. Observation and reading assessment results showed a significant improvement in students' reading skills. Five of the six students showed progress in word recognition and reading accuracy, while only one student continued to show limited progress. These findings indicate that the use of interactive magnetic media can improve students' literacy skills, although there is a need for further support for some students who face specific challenges in learning to read.

The use of interactive magnetic board media has proven to increase the reading interest and reading skills of elementary school students, including students with special needs. Research conducted at two elementary schools, SD Negeri Tlogowungu 02 and SD Negeri Trangkil 06, shows that the application of interactive magnetic boards can positively affect students' reading skills. Initially, 6 out of 12 students showed low reading interest and reading ability. After the application of the interactive magnetic board, 10 students showed significant improvement in both areas, with most students showing development in word recognition and reading (Stevens et al., 2021). These findings support research results showing that interactive learning media can encourage student participation and improve their literacy skills, especially for students with special needs (Aisia et al., 2023). Additionally, the interactive magnetic board also introduces a multisensory approach, which combines visual, auditory, kinesthetic, and tactile stimulation, proven effective for students with learning difficulties, such as dyslexia (Primasari & Supena, 2021).

The interactive magnetic board functions as a multisensory medium combining learning elements of visual (letters on the board), auditory (letter sounds pronounced by the teacher), and tactile (movable letters). This approach aligns with the Orton-Gillingham method, which teaches reading and writing in an explicit and structured way using stimulation of various senses (Stevens et al., 2021). Research by Primasari & Supena (2021) shows that multisensory instruction, involving letters made of textured materials or letter cards, can help dyslexic children learn to read more effectively. Furthermore, research by Lutfia et al. (2021) reports that the use of interactive media, such as flipcharts or magnetic boards, can significantly improve the reading skills of students with autism, by providing stimulation that arouses their visual and tactile senses. This indicates that multisensory learning media has the potential to enrich the reading learning experience for students with special needs.

Reading skills in inclusive elementary schools are greatly influenced by the diversity of student needs. At SD Negeri Trangkil 06, consisting entirely of students with special needs, the interactive magnetic board proved effective despite initial doubts about its implementation. Although some students had difficulty concentrating, the use of magnetic board media successfully captured their attention with colorful visuals and fun elements, increasing motivation and active participation in learning. As a result, most students showed clear improvement in their reading abilities, including the ability to recognize letters and form words. Research by Beckerson et al. (2024) reveals that engaging and interactive media is highly beneficial for students with special needs, as it stimulates students' cognitive and emotional engagement.

These findings are also in line with research by Prawira & Wahyuni (2024) which shows that students in inclusive classes often experience difficulties in basic reading skills. This problem, especially for students with special needs such as dyslexia and autism, necessitates the use of tailored teaching approaches. The interactive magnetic board serves as a learning tool that can be adapted to various student ability levels, thus it can be used to support students experiencing literacy difficulties, including in word recognition and formation. By using the magnetic board, students can physically interact with the learning material, which accelerates the process of mastering phonemes and vocabulary, and reduces phonological difficulties often experienced by dyslexic students (Sepsita & Wijaya, 2024).

The use of interactive media, particularly magnetic boards, in inclusive education shows a significant positive impact on students' reading interest and ability, including for those with special needs. Faruq (2022) shows that the application of a multisensory learning model for dyslexic children, involving visual, auditory, and tactile stimulation, is effective in improving basic reading skills. In this regard, the interactive magnetic board as a multisensory medium provides opportunities for students to learn to read using the senses of sight (seeing letters), auditory (hearing letter sounds), and tactile (touching magnetic

letters), which proves to support dyslexic students in overcoming their reading barriers (Sepsita & Wijaya, 2024). The results of this study align with the findings of Rosadi and Wachidah (2024), who reveal that media stimulating several senses, such as a magnetic board, contributes to improving the reading skills of children with autism disorders, especially in increasing their engagement in learning activities.

Additionally, research by Kim et al. (2021) shows that interventions involving engaging learning tools can strengthen basic academic skills, including reading ability. Interventions using multisensory media like interactive magnetic boards allow students to access learning more actively, which in turn improves their reading skills. A similar finding was reported by Little et al. (2021), who state that teaching strategies involving multisensory stimulation support the development of reading skills among students, including in inclusion classes, by providing a more comprehensive and in-depth learning opportunity. Therefore, the interactive magnetic board can be considered a tool that supports literacy development for students with diverse needs, ensuring they have a better chance to develop their reading skills in an inclusive educational environment.

Furthermore, research conducted by Yusop & Yassin (2020) and Zunaida et al. (2020) regarding the use of a sensory garden approach to improve the learning focus of autistic students indicates the importance of integrating media that can stimulate more than one sense in creating an inclusive and effective learning environment. In this context, the interactive magnetic board functions as a tool that not only stimulates learning focus but also improves reading skills by providing a fun and interactive experience. The results of this study reflect that the multisensory approach, implemented through media like the magnetic board, can increase student engagement and reading interest, including those facing learning challenges. These findings also support the importance of providing adaptive and inclusive aids in elementary schools to support students' literacy development, especially those with special needs.

Overall, the use of the interactive magnetic board has proven effective in increasing the reading interest and reading skills of elementary school students, including in inclusive schools. By providing rich visual, auditory, and tactile stimulation, the interactive magnetic board is able to create a learning experience that is engaging, enjoyable, and supports active student involvement. Therefore, it is important for educators to integrate this innovative learning tool into their teaching strategies, especially to support students with special needs in developing their literacy skills.

The use of interactive magnetic boards has proven effective in improving students' reading skills in inclusive classes, especially for those with special needs. With a multisensory approach that combines visual, auditory, and tactile elements, this media provides a more comprehensive and in-depth learning experience. This confirms that the interactive magnetic board can be a highly valuable learning tool in supporting early literacy development in elementary school students, both regular and those with special needs (Aisia et al., 2023; Lutfia et al., 2021; Sepsita & Wijaya, 2024). The implementation of this media in inclusive schools demonstrates the importance of selecting learning tools that can accommodate various student learning styles and facilitate equitable literacy achievement for all students.

Overall, the use of the interactive magnetic board as a learning medium in inclusive schools has proven to have a positive impact on students' reading interest and reading skills. This is reflected in the high enthusiasm and active participation of students during the learning process. The observed increase in interest and reading skills in this study indicates that child-friendly learning media, such as the magnetic board, can be an effective tool in supporting literacy development among students with special needs, as well as creating a fun and inclusive learning experience.

Teachers can use magnetic-board media as a structured literacy support tool by sequencing activities from letter recognition to word-building and simple sentence reading. In inclusive classes, differentiated scaffolding should be applied, such as larger letter cards, fewer task items, repeated instructions, peer support, and shorter activity cycles to maintain focus.

This study has limitations, including a small purposive sample (N = 12), a short intervention period (two sessions), and limited follow-up measurement of reading retention. Future research is recommended to use larger samples, longer intervention duration, repeated measures, and comparative designs (e.g., magnetic board versus conventional media) to estimate effect sizes and sustainability more robustly.

CONCLUSION

The findings of this study affirm the effectiveness of the interactive magnetic board as a pedagogical tool that can increase reading interest and reading skills among early-grade elementary school students. The integration of visually stimulating elements, such as colorful images and movable letters, creates an engaging and interactive platform that significantly transforms the reading experience for students. Initially, most students showed low interest in reading activities. However, after the implementation of the interactive magnetic board, there was a significant increase in student engagement and motivation. The tactile and interactive nature of the magnetic board encourages the creation of a more dynamic learning environment, which in turn encourages students to actively participate in reading exercises. These findings align with previous research showing that interactive learning media can enrich literacy experiences, especially in the context of inclusive education and for students with special needs.

Further quantitative assessment confirmed these observations. Of the 12 students evaluated, 6 initially faced challenges in reading ability. After intervention with the interactive magnetic board, 4 of these 6 students showed significant improvement, with a 75% increase in reading skills within this subgroup. Consequently, 10 out of 12 students achieved an adequate level of reading proficiency.

The analysis confirms that interactive magnetic-board media is a promising child-friendly instructional tool for improving reading interest and early reading skills among elementary students in both regular and inclusive classrooms. Students showed stronger engagement, more active participation, and measurable gains in early reading performance after the intervention. As a practical and multisensory medium, the magnetic board can support teachers in providing inclusive literacy instruction, especially when accompanied by appropriate scaffolding for diverse learners. Its low cost and flexibility make it suitable for classroom implementation in schools with varying resources. Future studies should examine longer-term implementation, larger samples, and stronger comparative designs to confirm the consistency and magnitude of its effects and to identify which student groups benefit most.

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