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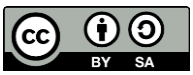

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The Effect of Using Bigbox Application on Reading Comprehension of 5th Grade Elementary School Students

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Abstract

Reading comprehension is a crucial skill for elementary school students, yet many still face challenges due to limited vocabulary, low engagement, and the limitations of traditional teaching methods. With the advancement of digital technology, applications such as *BigBox* have been developed to provide interactive storybooks, vocabulary activities, and gamified exercises that foster student motivation and comprehension. This study aims to investigate the effectiveness of the *BigBox* application in improving the reading comprehension of 5th-grade elementary school students based on students' perspectives. A qualitative case study design was employed, involving classroom observations, semi-structured interviews, focus group discussions, and student journals. The data was analyzed by thematic analysis. The findings indicate that *BigBox* supports students' comprehension by enhancing engagement, motivation, and active participation compared to conventional reading practices. The interactive features of the application, including digital books, vocabulary exercises, and reading comprehension quizzes, played a crucial role in engaging students and improving their understanding of texts. The study highlights the potential of integrating digital applications like *BigBox* into elementary reading programs as a transformative approach to strengthening literacy development.

Keywords: *Bigbox application, digital learning, elementary education, reading comprehension*

Introduction

Reading comprehension is a cornerstone of academic achievement and a critical skill for lifelong learning. It serves as the foundation for knowledge acquisition across all disciplines, allowing students to interpret, analyze, and synthesize information (Anderson et al., 1985). At the elementary school level, the development of strong comprehension skills is particularly crucial, as it enables children to transition from learning to read toward reading to learn. Without adequate comprehension, students struggle not only in language related subjects but also in mathematics, science, and social studies where reading is essential to understanding instructions and content (Afflerbach et al., 2008).

Despite its importance, many students face persistent challenges in achieving reading proficiency due to limited resources, lack of motivation, and the monotonous nature of traditional reading instruction (Fang, 1996; Day & Bamford, 1998). In recent years, educational research has increasingly emphasized the role of motivation and engagement in literacy development. Traditional instruction, often centered on repetitive drills and teacher-led reading sessions, may not always foster curiosity or sustained interest among young learners (Bruner, 1966; Black & Wiliam, 2009). Motivation theories such as self-determination theory highlight that intrinsic motivation plays a key role in sustaining students' engagement and long-term success (Deci & Ryan, 2000). Similarly, Bandura (1997) underscores the importance of self-efficacy in shaping learners' confidence and persistence. These perspectives suggest that innovative instructional approaches are needed to not only teach reading comprehension strategies but also cultivate students' enthusiasm for reading.

The integration of digital technologies into education has emerged as one such approach to address these challenges. Digital platforms provide multimodal and interactive environments where learners can engage with texts in diverse ways that go beyond printed materials (Clark & Mayer, 2016; Dalton & Proctor, 2008). Research indicates that the use of multimedia—such as audio, visuals, animations, and games—can significantly enhance comprehension by catering to different learning styles and promoting active participation (Fadel & Lemke, 2008; Bishop et al., 2008). Moreover, technology allows for personalization, offering students the flexibility to learn at their own pace while receiving immediate feedback that supports metacognitive awareness and strategic reading (Anderson et al., 2008; Coiro & Dobler, 2007).

Mobile and web-based applications, in particular, have shown considerable potential in improving literacy outcomes. Studies have demonstrated that digital tools can increase motivation, boost academic achievement, and enhance student performance in both higher and primary education settings (Alqahtani & Mohammad, 2015; Alsubaie, 2016). Learning in digital environments not only improves academic results but also fosters positive attitudes toward learning, as students often find interactive tasks more engaging compared to conventional

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reading (Chen & Huang, 2012; Ching & Hsu, 2013). This shift reflects the broader trend of digital literacy as an essential survival skill in the 21st century, equipping students with the ability to navigate and critically engage with information in a technology driven world (Eshet-Alkalai, 2004).

Gamification has further expanded the possibilities of digital learning by incorporating game features such as rewards, challenges, and interactive problem-solving. These elements have been shown to significantly enhance learner motivation, persistence, and enjoyment (Bowman, 1982; Deterding, Dixon, Khaled, & Nacke, 2011). A systematic review also found that digital games and game-based designs contribute to improved learning outcomes across different age groups (Clark, Tanner-Smith, & Killingsworth, 2016). However, while gamification holds promise, it is important to recognize that not all approaches yield equal results, and careful design is necessary to ensure that educational goals remain at the forefront (Dichev & Dicheva, 2017). In this context, the *BigBox* application has been developed as an innovative educational tool aimed at improving reading comprehension among elementary school students.

BigBox integrates digital storybooks, interactive vocabulary activities, quizzes, and gamified elements to make reading both enjoyable and effective. By engaging students through multimedia and interactive exercises, the application aligns with theories of multimodal learning and intrinsic motivation (Gee, 2007; Gee, 2012). Unlike traditional instruction, which often emphasizes passive text consumption, *BigBox* encourages active participation and self-directed learning. Such features hold particular relevance for primary education, where fostering early engagement and positive attitudes toward reading is crucial for long-term literacy development.

Despite the growing adoption of digital learning tools, empirical research on the effectiveness of specific applications remains limited, particularly at the elementary school level. Previous studies have provided evidence that technology can enhance comprehension and engagement (Fadel & Lemke, 2008; Clark & Mayer, 2016), yet few have examined platforms like *BigBox* in depth. Additionally, most studies have focused on broader categories of digital resources such as e-books and multimedia platforms. There is still limited research specifically examining interactive, game-based applications such as *BigBox* in the context of elementary school reading comprehension. Addressing this gap is crucial to better understand how *BigBox* can provide targeted support in enhancing young learners' comprehension skills.

This study therefore seeks to evaluate whether the *BigBox* application significantly improves the reading comprehension skills of 5th-grade elementary school students compared to those receiving traditional reading instruction. The findings of this research are expected to contribute to the growing body of evidence supporting the integration of educational technologies into reading instruction, offering practical insights for teachers, parents, and policymakers about how digital applications can play a transformative role in enhancing literacy education. The

research questions of this study are formulated as follows:

1. What are reading comprehension problems faced by 5th-grade elementary school students?
2. How does the *BigBox* application improve the reading comprehension skills of 5th-grade elementary school based on students' perspectives?
3. The main objectives of this research are:
4. To analyze the impact of the *Bigbox* application on the reading comprehension skills of 5th-grade students.
5. To investigate the students' perspectives of the *Bigbox* app in improving the reading comprehension.
6. To provide insights and recommendations for integrating digital learning tools into elementary school reading programs

Literature Review

The importance of reading comprehension as a foundational skill for academic success has been extensively documented. Comprehension enables students to understand, process, and engage with a variety of texts, contributing to their overall cognitive and academic development. A growing body of research highlights the role of instructional strategies and tools in improving reading comprehension, especially in young learners. In recent years, there has been an increasing focus on integrating digital learning tools to enhance these skills, as traditional methods may not always meet the diverse needs of students (Guthrie & Wigfield, 2000; National Reading Panel, 2000).

Reading Comprehension and Its Importance in Early Education

Reading comprehension is more than just the ability to decode words. It involves interpreting, analyzing, and critically engaging with texts. According to Snow (2002), reading comprehension is the result of the interaction between the reader's prior knowledge, the text being read, and the strategies the reader uses to make sense of the material. In primary education, the development of these skills is essential, as reading proficiency is strongly correlated with later academic success in other subjects like science, history, and mathematics (National Reading Panel, 2000). However, many elementary students struggle with comprehension, particularly when exposed to challenging texts that require advanced cognitive strategies.

Challenges in Traditional Reading Instruction

Traditional methods of teaching reading often rely on printed texts, teacher-led instruction, and individual silent reading. While these approaches have been foundational, they may not be sufficient for all learners, especially those who struggle with motivation, engagement, or have different learning styles. Studies have found that some students, particularly those who are less motivated or find reading difficult, may disengage from reading activities if traditional methods fail to capture their

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interest (Guthrie & Wigfield, 2000). Consequently, there is a growing call for more innovative and interactive methods to engage students in reading comprehension.

The Role of Technology in Enhancing Reading Comprehension

In recent years, educational technology has gained traction as a means to support and enhance reading comprehension. Digital tools such as e-books, interactive quizzes, and multimedia platforms provide students with engaging, dynamic experiences that can help them understand and retain reading material more effectively. According to a study by Cheng (2017), digital tools offer several advantages over traditional methods, including increased interactivity, personalized learning experiences, and immediate feedback. These factors can lead to greater student engagement and improved learning outcomes. Additionally, digital platforms can cater to diverse learning styles, allowing students to interact with content in a way that suits their preferences, whether through visual, auditory, or kinesthetic modalities.

Educational Apps and Their Impact on Reading Skills

Educational applications, such as the *bigbox* platform, have been developed to integrate interactive elements into the learning process, making reading both fun and effective. According to research by Zosh et al. (2017), digital learning apps that include interactive features, like games, quizzes, and animated stories, have been shown to significantly improve students' comprehension skills. These tools engage students not only by providing immediate feedback but also by motivating them to participate actively in learning activities. Additionally, apps like *bigbox* can track students' progress, provide personalized content, and adapt to students' learning speeds, ensuring that each learner can benefit from targeted support (Bebell & O'Dwyer, 2010).

A similar study by Davis and Bistodeau (2020) found that when students were exposed to eBooks with integrated comprehension checks, their performance on post-reading tests improved significantly. The interactive nature of these books, which often included vocabulary exercises, comprehension quizzes, and embedded multimedia, helped students retain information and understand complex texts better than with traditional reading methods. These findings suggest that the incorporation of interactive, technology-driven learning tools can be more effective than traditional methods in boosting comprehension skills. The *bigbox* application offers a comprehensive approach to improving reading comprehension by combining interactive books, quizzes, and vocabulary exercises, tailored to young learners.

The use of animations, engaging characters, and storylines in *bigbox* is designed to capture the attention of students and keep them motivated to continue learning. According to Johnson (2019), applications like *bigbox* not only make learning more enjoyable but also help students develop critical thinking skills by

encouraging them to analyze, predict, and reflect on the content they are reading.

Moreover, *bigbox*'s ability to adapt to each student's learning pace provides a personalized experience that can be particularly beneficial for struggling readers. By offering tailored exercises and continuous feedback, students are more likely to remain engaged and experience a sense of progress, which is crucial for boosting self-esteem and confidence in reading abilities (Ally, 2019). The interactive elements, such as quizzes, flashcards, and instant feedback, can also enhance vocabulary acquisition and improve overall comprehension, which is essential for long-term academic success.

Previous Studies on the Effectiveness of Digital Learning Tools in Reading

Several studies have explored the effectiveness of digital platforms similar to *bigbox* in improving reading comprehension. For instance, a study by McKnight et al. (2018) compared the reading comprehension skills of students using a traditional textbook approach to those using a digital platform with interactive reading materials. The results showed that students in the digital learning group scored significantly higher on reading comprehension tests, particularly in their ability to recall details and summarize main ideas.

Similarly, a study by Chang and Chen (2017) investigated the use of a digital storytelling app and found that students who used the app demonstrated greater improvements in reading comprehension, engagement, and motivation compared to those who read traditional print texts. These findings align with the hypothesis that digital learning applications can offer a more dynamic, engaging way to support reading development and enhance comprehension skills, the literature supports the effectiveness of digital tools in improving reading comprehension, there is limited research specifically focused on platforms like *bigbox*, particularly in the context of elementary education.

Most studies have focused on broader categories of digital tools, such as e-books and multimedia content, without examining the impact of interactive, game-based applications on young readers' comprehension skills. Therefore, this research aims to fill this gap by evaluating the specific impact of the *bigbox* application on 5th-grade students' reading comprehension.

Method

Research Design

The research employed a qualitative approach to Baxter & Jack (2008)*: Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers"* explore the impact of the *bigbox* application on the reading comprehension skills of 5th-grade elementary school students. The study focused on gaining a deeper understanding of students' personal experiences, attitudes, and perceptions regarding the use of technology in learning, compared to traditional reading methods.

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Techniques of Data Collection

To achieve this, the study utilized several data collection methods, including semi-structured interviews, focus group discussions, classroom observations, and student reflections. After the intervention, a selection of students from both the experimental and control groups will participate in one-on-one semi-structured interviews. These interviews explored the students' experiences with the *bigbox* application or traditional reading methods, asking them about what they enjoyed most, what they found challenging, and how they felt the tools helped them understand the reading material. Open-ended questions would be used to encourage students to reflect on their engagement, motivation, and the overall impact of their learning experiences.

Additionally, focus group discussions conducted with both the experimental and control groups separately. These group discussions enabled students to share their thoughts in a collaborative setting, providing insights into their collective experiences and offering a platform for students to express their views on the effectiveness of the different reading methods. The researcher also observed students during their reading sessions to assess their behavior and interaction with the learning tools. Classroom observations focused on signs of engagement, enthusiasm, and any difficulties students may encounter while using the *bigbox* application or reading from textbooks. These observations help provide context to the students' feedback from the interviews and focus groups.

Furthermore, students were asked to keep weekly journals during the intervention period to document their reflections on the reading lessons. These journals served as a means for students to express their personal thoughts on their learning process, challenges they faced, and how the activities impacted their reading comprehension. The journals include both guided prompts and open-ended questions, allowing students to provide their subjective experiences in their own words.

Techniques of Data Analysis

All of the qualitative data collected from interviews, focus groups, observations, and student journals would be transcribed and analyzed using thematic analysis. Thematic analysis will allow the researcher to identify recurring themes and patterns related to student engagement, motivation, the perceived effectiveness of the reading methods, and any challenges faced during the learning process (Braun & Clarke, 2006).

The researcher will carefully examine the data to uncover insights into how the use of the *bigbox* application might have enhanced students' reading comprehension and their engagement with the reading material compared to traditional methods. This analysis will provide a comprehensive understanding of the students' learning experiences and contribute to a deeper exploration of the potential benefits and drawbacks of integrating educational technology into early

education. Ethical considerations will be carefully addressed, with informed consent obtained from students and their parents, and the confidentiality of participants' responses will be maintained throughout the study.

Findings

Bigbox Application Significantly Improve the Reading Comprehension Skills of 5th-Grade Elementary School Students

The results of this study strongly suggest that the use of the *bigbox* application significantly improved the reading comprehension skills of 5th-grade students in the experimental group. When comparing pre-test and post-test results, students who engaged with the *bigbox* application exhibited notable improvement in various aspects of reading comprehension, such as understanding the main ideas, recalling specific details, making inferences, and interpreting context clues.

The pre-test results indicated that both the experimental and control groups had similar levels of reading comprehension at the start of the study. However, after several weeks of using the *bigbox* application, the experimental group showed substantial growth. In particular, students in this group scored higher on comprehension questions related to identifying the main idea of the text and drawing inferences from the reading material. Many students reported feeling more confident about their understanding of the material, as the interactive elements in the app allowed them to engage with the content in ways that made the reading more accessible and enjoyable

> *"When I use Bigbox, I feel more excited to read. The stories are interesting, and there's audio, so I understand the meaning faster. If there's a difficult word, I can check its meaning right away in the app."*

Focus group discussions revealed that students appreciated the visual and interactive features of the app, particularly the animated stories and the vocabulary-building exercises. One student commented,

> *"The pictures and animations helped me understand the story better because I could see what was happening."*

The app's vocabulary exercises also helped students grasp the meaning of difficult words, which was instrumental in their comprehension. Through interactive quizzes, students were able to receive immediate feedback on their performance, allowing them to track their progress and correct their mistakes. This real-time feedback gave students a sense of accomplishment, motivating them to continue improving their reading skills. The observational data further confirmed that students in the experimental group were highly engaged during reading sessions, showing increased focus, excitement, and participation in discussions about the texts. The results from both the post-test and the observations indicated that the *bigbox* application significantly enhanced students' reading comprehension skills.

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The Effectiveness of the Bigbox Application Compare to Traditional Reading Instruction in Enhancing Students' Comprehension Skills

The comparison between the *bigbox* application and traditional reading methods demonstrated that the use of the application had a more significant impact on students' comprehension skills. The findings revealed that the experimental group, who used the *bigbox* application, showed a higher level of engagement and a greater improvement in reading comprehension than the control group, which relied on traditional textbook-based instruction.

One of the key differences noted in the study was the level of engagement. The experimental group, utilizing the *bigbox* application, reported feeling more motivated and excited about their reading lessons. The gamified elements of the app—such as quizzes, vocabulary challenges, and interactive animations—kept students interested and encouraged them to continue reading. A student from the experimental group expressed,

> "*I looked forward to using the app because it was like a game where I could earn stars and learn new things about the story.*"

The ability to track progress through visual indicators (like earning stars or completing levels) seemed to foster a sense of achievement and encouraged students to keep pushing their limits. This sense of immediate accomplishment through the app's feedback system was particularly beneficial in reinforcing students' comprehension and boosting their motivation.

In contrast, students in the control group, who were using traditional textbooks, expressed lower levels of enthusiasm for their reading activities. Many students from the control group found the reading lessons to be repetitive and disengaging. One student remarked,

> *"Reading from the book was boring because it was just text and no games to make it interesting."*

The absence of interactive features made it more difficult for students to stay focused during the reading tasks, and several students in the control group seemed disinterested during the sessions. Classroom observations of the control group also revealed that students appeared passive and distracted. They showed fewer signs of active engagement, such as asking questions or contributing to group discussions, compared to students using the *bigbox* application. Additionally, students in the control group struggled more with understanding complex ideas and vocabulary, as they lacked the same interactive support provided by the application. These students often had difficulty recalling key details from the text or understanding difficult words without additional help from the teacher.

The post-test results further highlighted the difference in reading comprehension between the two groups. While both groups made progress, the experimental group showed more significant improvement. The students in the experimental group were able to answer more detailed questions about the text, demonstrate a better understanding of the main themes, and draw more accurate

inferences. Many of these students attributed their improvement to the app's interactive quizzes, which allowed them to test their comprehension in real-time. For instance, a student from the experimental group shared,

> *"The quizzes made me think about the story in different ways, and I could see where I made mistakes, which helped me understand the story better."*

The control group, on the other hand, showed more modest improvements and faced challenges with retention and comprehension. While they were able to recall some details from the text, their understanding of the material seemed less robust than that of the experimental grou*p.*

> *"Reading from a book is nice too, but sometimes it's boring. If there's a difficult word, I wait for the teacher to explain it, so it takes longer to understand the story."*

The qualitative data from student feedback, teacher observations, and focus group discussions indicated that the traditional method, while effective in providing basic instruction, lacked the engaging, interactive elements that have been shown to enhance comprehension. The students in the control group found the lessons more difficult to connect with, and this appeared to limit their ability to deepen their understanding of the reading material. As a result, the findings suggest that the *bigbox* application, with its interactive features and gamified learning environment, was a more effective tool for enhancing reading comprehension skills compared to traditional reading methods.

Discussion

Impact of the Bigbox Application on Reading Comprehension

The study found that the use of the *bigbox* application significantly improved the reading comprehension skills of 5th-grade students. This result is consistent with previous research on the use of educational technology in language learning. Studies by Liu & Chen (2019) and Gülbahar (2021) have demonstrated that interactive digital platforms can enhance students' engagement and motivation, which in turn leads to improved learning outcomes. In the case of the *bigbox* application, its interactive features—such as animated stories, vocabulary-building games, and quizzes—appeared to make reading more engaging for students, thus enhancing their ability to comprehend the material.

The application's interactive nature allowed students to actively engage with the content, rather than passively consuming it as is common with traditional reading methods. This aligns with Vygotsky's Social Constructivism Theory, which emphasizes the importance of interaction in the learning process. According to Vygotsky, learning is enhanced when students can engage in social activities, such as discussions and collaborative tasks, or, in the case of the *bigbox* app, when students interact with dynamic media that brings stories and texts to life. By allowing students to participate in learning through activities such as quizzes and vocabulary challenges, the *bigbox* app created a more active learning environment, facilitating a

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deeper understanding of the material. The ability to immediately test comprehension through feedback also contributed to the application's effectiveness, as it reinforced learning in real-time and helped students retain information better.

The positive feedback from students regarding the app's engaging features also supports the concept of gamification in education, where game-like elements such as rewards, progress tracking, and instant feedback are integrated into the learning process. Deterding et al. (2011) argue that gamification not only enhances engagement but also helps to build intrinsic motivation in learners. Many students in the experimental group reported feeling more motivated to read because they were able to earn rewards for their achievements. These findings are particularly significant as they indicate that the enjoyment and sense of accomplishment gained from gamified learning experiences directly contribute to better comprehension.

Comparing Bigbox to Traditional Reading Instruction

The comparison between the *bigbox* application and traditional reading methods revealed that the app was more effective in promoting reading comprehension. While both groups improved their reading skills over the course of the study, the experimental group, which used the *bigbox* application, showed a greater improvement in understanding complex texts, recalling key details, and making inferences. In contrast, the control group, which relied on traditional textbook-based instruction, demonstrated slower progress and showed lower engagement.

This difference in effectiveness can be attributed to the interactive nature of the *bigbox* application. Traditional reading methods, which typically involve reading from a textbook and answering questions at the end of the passage, often fail to capture students' attention and sustain their motivation over time. Sweller's Cognitive Load Theory (1988) suggests that traditional reading can overwhelm students with too much information at once, especially if the material lacks visual or interactive elements. By contrast, the *bigbox* app broke down information into manageable chunks, presented through interactive media and visuals, which helped students process and retain information more effectively.

The lack of engagement in the control group is also worth noting. Many students in the control group expressed boredom with the textbook-based lessons, and observations showed that they often became distracted during reading sessions. This is consistent with findings by Deci & Ryan (2000), who argue that engagement and motivation are critical components of successful learning. Without the interactive features of the *bigbox* app, students in the control group seemed less motivated to actively engage with the material, leading to poorer comprehension results Additionally, teacher observations highlighted the fact that traditional methods often lack the instant feedback that digital platforms like *bigbox* provide. Students in the experimental group were able to immediately check their comprehension through quizzes and receive corrective feedback, which led to

quicker mastery of the material. In contrast, students in the control group had to wait for teacher feedback after completing exercises, which delayed the learning process and led to less efficient comprehension improvement.

Challenges and Limitations of the Bigbox Application

While the results clearly indicate the effectiveness of the *bigbox* application in improving reading comprehension, it is important to acknowledge the challenges that were faced during the study. One significant challenge reported by students was related to technical issues, including difficulties with navigating the app or occasional connectivity problems. These technical disruptions, although temporary, led to frustration for some students, which might have hindered their ability to focus fully on the learning activities. It is essential that future implementations of the app provide more thorough technical support and guidance for students to minimize these issues. Additionally, while most students adapted quickly to the application, there was a small group who required additional assistance in understanding how to use the app's features effectively. This suggests that, while the app is user-friendly, initial guidance and support may be necessary, particularly for students who are less familiar with digital tools.

Moreover, although the app demonstrated clear benefits in improving reading comprehension, it is crucial to consider its sustainability in the long term. The novelty of using the app may have initially boosted student engagement and motivation, but there is a need to assess whether these benefits can be sustained over an extended period of use. Future research could explore how to integrate the *bigbox* app into the classroom environment in a way that keeps students engaged over the long term, possibly by incorporating a blended learning approach, where students use both digital tools and traditional methods in a complementary manner.

Conclusion

This study examined the effectiveness of the *bigbox* application in improving the reading comprehension skills of 5th-grade elementary school students. The findings clearly indicate that students who used the *bigbox* application demonstrated significant improvements in reading comprehension compared to those who followed traditional reading instruction. The interactive nature of the application, which included animated stories, vocabulary-building exercises, and quizzes, contributed to higher levels of student engagement, motivation, and comprehension.

The study also revealed that the *bigbox* application was more effective than traditional reading methods in fostering comprehension. While traditional textbook-based instruction provided basic reading practice, it lacked the interactive and engaging elements that helped students actively process and retain information. Students using *bigbox* were more eager to participate in reading activities and were able to grasp complex texts more effectively due to the immediate feedback and gamified learning experience, the research highlighted the importance of digital

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learning tools in modern education. The integration of technology in reading instruction not only improved students' comprehension skills but also made learning more enjoyable. However, technical challenges and the potential need for long-term engagement strategies must be addressed to ensure the sustainability of such digital tools in education.

Overall, this study supports the implementation of interactive digital learning tools as a means to enhance reading comprehension in elementary education. The results suggest that educators and policymakers should consider incorporating digital applications like *bigbox* into classroom instruction to maximize student learning outcomes.

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