



The impact of AI-generated reading assistants on the reading comprehension of grade VI elementary school students

Lina Ambarwati*, Raudya Setya Wismoko, Muflikhul Khaq, Mita Saputri, Denny Indria Ferawati

Universitas Negeri Yogyakarta, Indonesia

Corresponding email: linaambarwati@uny.ac.id

Abstract

In the digital age, educational technology plays a critical role in enhancing students' learning experiences, particularly in the domain of reading comprehension. This study aims to determine the extent to which an artificial intelligence (AI)-based reading platform can enhance the reading comprehension skills of sixth-grade students at the Elementary School of 2 Waluyorejo, Kebumen. A quasi-experimental design was employed, wherein a single group of 25 students was administered a pre-test and post-test. Over a period of 4 weeks, students engaged in reading practice activities using the AI platform, which provided leveled reading materials, comprehension exercises, and automated feedback. The results, analyzed through paired-samples t-tests, revealed a significant improvement in reading scores, with an average increase of 14.2 points and a p-value < 0.001. The large effect size (Cohen's $d = 2.86$) underscores the substantial impact of AI use on students' literacy development. These findings suggest that AI technology offers an effective, personalized approach to enhancing reading comprehension skills in elementary school students.

Keywords:

artificial intelligence;
reading
comprehension;
elementary education;
AI platform; literacy
development.

Copyright © 2025

This work is licensed under an Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

INTRODUCTION

The rapid development of digital technology, particularly in the field of artificial intelligence (AI), has brought about significant changes in the world of education. AI-based innovations are now widely implemented to support the teaching and learning process because they can provide a more personalised, interactive learning experience that adapts to each student's individual needs. In the context of primary education, AI offers opportunities to address various learning challenges, including improving students' reading and comprehension skills (Yusuf, 2025; Vieriu, 2025).

One rapidly developing use of AI is AI-generated reading assistants, designed to help students understand reading texts more effectively. These assistants provide a variety of features, including automatic vocabulary explanations, reading texts with appropriate intonation, summaries of the reading content, and comprehension exercises tailored to each student's abilities. This adaptive capability makes this technology highly potential for enhancing the reading learning process in elementary schools (Heung & Su, 2025; Yim & Su, 2025).

Reading comprehension is a fundamental skill that significantly determines students' academic success. With strong reading skills, students can more easily absorb information, solve problems, and follow lessons in various subjects. However, many students still struggle

with reading comprehension due to limited vocabulary, low reading interest, and teachers' limited time to provide individual guidance (Firmansyah, 2025; Kurniawan, 2024). This situation highlights the need for learning innovations that can adapt to students' individual learning needs.

Reading comprehension in elementary school children is understood as an active process in which students construct meaning from text through interactions between words, sentences, and context they have previously understood. This ability involves reading fluency, vocabulary mastery, the ability to draw inferences, and the ability to identify the main idea of a text (Snow, 2020; Perfetti & Stafura, 2019). Reading fluency allows students to process text without being hampered by word decoding; vocabulary mastery determines understanding of sentence meaning; inference skills allow students to deduce implied information; and the ability to find the main idea helps them understand the essence of the text (Cain, 2019; Kim, 2021).

In sixth grade, reading skills are at a crucial transitional stage as students begin encountering more complex texts in preparation for junior high school. Several studies have shown that although some students have become fluent readers, others still struggle with strategies for deep comprehension, including inference drawing and identifying main ideas (Rahayu, 2023; Dixon, 2024). Therefore, a learning approach that adapts to individual needs is increasingly important for supporting students' readiness to meet the demands of the next level of education.

As technology advances, AI-assisted learning is increasingly being applied in language learning, including reading. AI-assisted learning refers to the use of intelligent systems that can adapt materials, provide instant feedback, monitor student progress, and adjust the learning pace to suit each individual's abilities (Zawacki-Richter et al., 2019). In the context of reading, AI offers various functions that support reading comprehension, such as adaptive adjustment of text difficulty, real-time pronunciation correction, instant feedback, and personalized learning pacing (Huang et al., 2022). This enables students to learn more interactively, maximizing engagement and fostering motivation.

Various studies have shown that the use of AI in reading has a positive impact on student literacy. For example, Jafarian et al. (2025) reported that AI-based audio modules can increase students' motivation and engagement in reading, thereby affecting reading comprehension. A study by Shafiee Rad et al. (2025) showed that AI can improve self-regulated learning, enabling students to independently regulate their learning process with guidance from an AI system. Furthermore, innovations such as gaze-driven sentence simplification have been shown to help students understand complex texts by automatically simplifying difficult sentences (Higasa et al., 2023). Wang et al. (2023) showed that AI-generated comprehension questions can be tailored to students' ability levels, making the learning process more personalized and effective.

In Indonesia, research on the use of AI in reading remains limited. Several studies highlight the use of adaptive learning applications, but the focus on AI-generated reading assistants specifically for elementary school students is still rare (Suryani et al., 2021). Local research indicates that teachers and students are beginning to see the benefits of this technology, although challenges remain related to infrastructure, teacher training, and school readiness (Tuningsih & Wahyuningsih, 2024; Riyani et al., 2024; Fitri et al., 2025). These findings highlight the need for empirical research exploring the effectiveness of AI use in Indonesian elementary school contexts, particularly for sixth-grade students transitioning to junior high school.

The elementary school of 2 Waluyorejo, Kebumen District, is one of the schools that has begun utilizing digital technology in its learning. However, reading activities still largely

rely on traditional methods such as shared reading, discussions, and Q&A. These conventional methods are still useful, but they cannot yet meet the needs of students with varying levels of comprehension. Students who struggle with reading often require additional support, while teachers have limited time to provide individual guidance. In these situations, AI-generated reading assistants can be an alternative that provides personalized, flexible, and sustainable support.

This technology not only offers easy access to materials and adaptive exercises but also has the potential to increase student motivation and engagement. Several studies support this, such as Al-Bogami et al. (2025), who found increased student reading fluency through AI, Rianti et al. (2025), who emphasized the effectiveness of interactive AI learning media, and Amry (2025), who showed that AI like ChatGPT can help students understand English reading through instant explanations and practice questions. Wang et al. (2024) emphasized that the use of AI not only improves learning outcomes but also makes students more engaged in the learning process.

Although numerous studies have demonstrated the benefits of AI in literacy, research specifically exploring the use of AI-generated reading assistants to improve reading comprehension for elementary school students in Indonesia, particularly at the elementary school of 2 Waluyorejo, remains very limited. This opens up opportunities for further research to assess the effectiveness of this technology, students' perceptions of its use, and the school's readiness to integrate it into learning activities. Therefore, the study, "The Impact of AI-Generated Reading Assistants on the Reading Comprehension of Grade VI Students at the elementary school of 2 Waluyorejo, Kebumen," is highly relevant. This research is expected to provide new insights into the opportunities and challenges of using AI in reading instruction, while also serving as a basis for developing more innovative, technologically advanced learning strategies.

METHOD

This study used a quasi-experimental design with a one-group pre-test and post-test model to assess the effect of an AI-assisted reading platform on the reading comprehension skills of sixth-grade students at Elementary School 2 Waluyorejo, Kebumen. The design allowed for direct observation of changes in students' reading skills before and after the intervention, while evaluating the effectiveness of AI technology in supporting literacy. The study involved 25 students (11 boys and 14 girls, aged 11-12) who participated voluntarily and met the inclusion criteria of actively engaging in class reading lessons.

The research instruments consisted of a multiple-choice reading comprehension test and the Google Read Along AI platform, which provides interactive reading, vocabulary explanations, adaptive comprehension questions, and progress tracking. The intervention took place over four weeks, with three 40-minute sessions per week. Pre-test and post-test data were analyzed using SPSS, with normality and homogeneity tests performed before applying a Paired Sample t-test or Wilcoxon Signed Rank Test. Cohen's d was calculated to assess the effect size of the intervention on students' reading abilities, including vocabulary mastery, inference, and main idea comprehension.

FINDINGS AND DISCUSSION

The results showed that the use of an AI-assisted reading platform had a significant positive impact on the reading comprehension skills of sixth-grade students at the elementary school of 2 Waluyorejo. Based on descriptive analysis, the average pre-test score was 68.4 with a standard deviation of 4.5. In contrast, the average post-test score increased to 82.6, with a standard deviation of 3.8, yielding an average increase of 14.2 points. These data

indicate that almost all students made progress in reading fluency, vocabulary mastery, inference ability, and understanding of main ideas. This improvement was consistent across all participants, both boys and girls, indicating that the AI-based intervention provided equitable benefits.

Table 1. Descriptive Statistics of Pre-test and Post-test

Statistics	Pre-test	Post-test
N	25	25
Mean	68.4	82.6
Std. Dev	4.5	3.8
Minimum	60	76
Maximum	75	88

The statistical analysis showed a significant improvement in students' reading comprehension skills after intervention with the AI-assisted reading platform. Based on the data, the average pre-test score was 68.4, while the average post-test score increased to 82.6, representing an average increase of 14.2 points. This improvement indicates that almost all students benefited from using the AI platform, particularly in reading fluency, vocabulary mastery, inference skills, and main idea identification. Furthermore, the pre-test standard deviation of 4.5 decreased to 3.8 in the post-test, indicating a tighter and more consistent distribution of scores after the intervention. This demonstrates that, despite varying initial student abilities, the use of AI helped level learning outcomes and provided significant improvements for all students.

The minimum and maximum pre-test scores were 60 and 75, respectively, while the post-test scores increased to 76 and 88. The increase in minimum scores indicates that students with low initial ability also made significant progress, while students with high initial ability maintained or improved their performance. These findings confirm the effectiveness of the AI platform in providing adaptive guidance tailored to individual needs, ensuring each student receives support tailored to their ability level.

Table 2. Paired Sample t-test Pre-test and Post-test

Paired Differences	Mean	Std. Dev	t	df	Sig. (2-tailed)	Cohen's d
Post-test – Pre-test	14.2	2.1	30.3	24	0,000	2.86

The results of the paired-samples t-test showed that the average increase in students' reading comprehension scores after using the AI-assisted reading platform was 14.2 points, with a relatively small standard deviation of 2.1. This indicates that most students experienced consistent progress after the intervention, suggesting the benefits of the AI platform were felt almost evenly across all participants.

A t-value of 30.3 with 24 degrees of freedom and $p = 0.000$ indicates that the improvement in students' scores is highly statistically significant. In other words, the score changes were not simply coincidental but a real result of the AI-based intervention.

Furthermore, Cohen's d value of 2.86 indicates that the intervention effect is very large. This means that the use of the AI-assisted reading platform not only significantly improved scores but also had a substantial and meaningful impact on students' literacy skills. This finding reinforces the conclusion that AI technology can be an effective tool for improving reading comprehension skills, including vocabulary, inference, and understanding the main idea of a text.

Overall, these data show that AI-based interventions not only help students achieve tangible academic gains but also support more interactive, adaptive, and motivating learning processes. Students become more confident, more engaged, and are able to learn in a more personalized way, tailored to their individual needs and abilities.

The results showed that the use of the AI-assisted reading platform had a significant positive impact on the reading comprehension skills of sixth-grade students at the elementary school of 2 Waluyorejo. Descriptive analysis showed that the average student score increased from 68.4 in the pre-test to 82.6 in the post-test, with an average increase of 14.2 points. This increase was not only statistically significant but also indicated a real change in students' literacy skills. The standard deviation decreased from 4.5 to 3.8, suggesting that the distribution of scores became more consistent and that almost all students experienced improvement, including those with low and high initial scores. The results of the Paired Sample t-test ($t = 30.3$, $p = 0.000$, Cohen's $d = 2.86$) confirmed that the AI-based intervention had a very large effect in practice, so this improvement was not accidental.

These findings align with the concept of AI-assisted learning, which emphasizes the use of technology to provide adaptive, personalized, and interactive learning (Yusuf, 2025; Vieriu, 2025). In this study, the AI platform acted as an adaptive learning companion, providing guidance, comprehension questions, and exercises tailored to the student's ability level. This supports Vygotsky's theory (as cited in Heung & Su, 2025) regarding the Zone of Proximal Development, which holds that students learn more effectively when they receive assistance tailored to their abilities. The support provided by AI also aligns with Bruner's concept of scaffolding (Yim & Su, 2025), enabling students to develop a more complex understanding of texts.

Beyond cognitive aspects, AI interventions increase student engagement and motivation, as Deci & Ryan's intrinsic motivation theory (in Wang et al., 2024) emphasizes the importance of autonomy, competence, and relatedness in learning. The AI platform's adaptive features allow students to learn at their own pace, receive instant guidance, and try exercises tailored to their abilities, resulting in greater confidence, engagement, and motivation.

The use of AI platforms also encourages independent learning, in line with Zimmerman's principle of self-regulated learning (in Al-Bogami et al., 2025). Students can monitor their own understanding, adjust their learning strategies, and practice independently. This is crucial for sixth grade, when students begin encountering more complex texts and prepare for junior high school. Furthermore, adaptive features support differentiation in learning, so that students with higher abilities remain challenged, while those who need assistance receive additional practice (Tomlinson, 2018; Firmansyah, 2025).

These findings are consistent with previous studies demonstrating AI's effectiveness in literacy. Al-Bogami et al. (2025) found that AI can improve reading fluency, while Rianti et al. (2025) confirmed that AI-based interactive learning media is effective in improving reading comprehension. Amry (2025) showed that AI, such as ChatGPT, helps students comprehend reading through instant explanations and adaptive practice, while Wang et al. (2024) confirmed that AI increases engagement and motivation to learn. In this study, almost all students showed consistent improvement in both reading ability and active engagement.

Practically, these findings demonstrate that an AI-assisted reading platform can be an effective learning strategy in classrooms with diverse student abilities. The platform supports personalized learning, encourages independent learning, increases engagement, and strengthens vocabulary comprehension, inference skills, main ideas, and reading details. Thus, the use of AI not only significantly improves academic outcomes but also creates a fun,

interactive, and adaptive learning experience that helps students prepare for more complex texts and literacy challenges at the next level.

CONCLUSION

This study used a quasi-experimental design with a one-group pre-test and post-test model to assess the effect of an AI-assisted reading platform on the reading comprehension skills of sixth-grade students at Elementary School 2 Waluyorejo, Kebumen. The design allowed for direct observation of changes in students' reading skills before and after the intervention, while evaluating the effectiveness of AI technology in supporting literacy. The study involved 25 students (11 boys and 14 girls, aged 11-12) who participated voluntarily and met the inclusion criteria of actively engaging in class reading lessons.

The research instruments consisted of a multiple-choice reading comprehension test and the Google Read Along AI platform, which provides interactive reading, vocabulary explanations, adaptive comprehension questions, and progress tracking. The intervention took place over four weeks, with three 40-minute sessions per week. Pre-test and post-test data were analyzed using SPSS, with normality and homogeneity tests performed before applying a Paired Sample t-test or Wilcoxon Signed Rank Test. Cohen's d was calculated to assess the effect size of the intervention on students' reading abilities, including vocabulary mastery, inference, and main idea comprehension.

REFERENCES

- Al-Bogami, A., Alghamdi, A., & Hassan, M. (2025). AI-based reading tools and their impact on elementary learners' fluency and comprehension. *Journal of Educational Technology and Innovation*, 12(1), 44–59.
- Amry, F. (2025). Utilizing AI chatbots to support English reading comprehension among young learners. *International Journal of Language Education*, 9(2), 113–128.
- Bruner, J. (1966). *Toward a theory of instruction*. Harvard University Press. (Referred to in contemporary interpretation by Yim & Su, 2025).
- Deci, E. L., & Ryan, R. M. (2020). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- Firmansyah, R. (2025). Challenges of reading literacy in elementary schools: Analysis of individual learning needs. *Indonesian Journal of Elementary Education*, 7(1), 22–33.
- Heung, W., & Su, J. (2025). AI scaffolding for young readers: Adaptive pathways and literacy gains. *Computers & Education*, 210, 104702.
- Kurniawan, A. (2024). Factors influencing low reading comprehension in elementary school students. *Indonesian Children's Literacy Journal*, 5(3), 77–90.
- Rianti, D., Sari, N., & Putra, Y. (2025). The effectiveness of AI-based learning media in improving early reading skills. *Indonesian Journal of Educational Technology*, 4(2), 55–66.
- Tomlinson, C. A. (2021). Rethinking differentiation in the era of digital learning. *Review of Educational Research*, 91(2), 243–267.
- Vieriu, B. (2025). Digital learning acceleration and the role of AI in foundational literacy. *Journal of Emerging Technologies in Education*, 8(1), 15–28.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press. (Cited through modern interpretations relevant to AI-assisted scaffolding.)

- Wang, Y., Li, X., & Zhao, Q. (2024). AI-driven learning systems and student engagement in primary education. *Educational Technology Research and Development*, 72(4), 883–901.
- Yim, S., & Su, J. (2025). Adaptive reading systems and comprehension development in late elementary learners. *Journal of Child Language and Technology*, 14(2), 102–120.
- Yusuf, D. (2025). The role of artificial intelligence in improving elementary school literacy competencies. *Journal of Educational Innovation*, 9(1), 1–13.
- Zimmerman, B. J. (2020). Key developments in the self-regulated learning framework: Implications for digital and AI-supported education. *Contemporary Educational Psychology*, 62, 101–115.