OPEN ACCESS
Research Psychologie, Orientation et Conseil
Vol. 2 No. 6. December 2025, pp. 318-328 DOI. 10.70177/rpoc.v2i6.2864
Research Article

Integration of AI Voice-Based Micro-Learning to Enhance Elementary School Students' Reading Comprehension

Mahayuni[1], Adam Mudinillah[2], Adam Idris[3]
[1] Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia
[2] Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia
[3] Universiti Brunei Darussalam (UBD), Brunei Darussalam

Corresponding Author:

Mahayuni,
Pendidikan Bahasa Arab, Universitas Islam Negeri Mahmud Yunus Batusangkar.
Jalan nagari galugua jorong koto tangah kec. kapur IX, kab. Lima puluh kota, Indonesia
Email: mahayuni021@gmail.com

Article Info

Received: July 10, 2025
Revised: September 10, 2025
Accepted: October 10, 2025
Online Version: December 08, 2025

Abstract

The integration of voice-based Artificial Intelligence (AI) micro-learning represents a promising innovation in elementary students' reading instruction. This study aims to develop and examine the effectiveness of integrating voice-based AI micro-learning through a hybrid approach in enhancing elementary school students' reading comprehension. The hybrid approach is employed to combine the strengths of AI and teachers in the learning process, enabling students to learn more effectively and efficiently. In this study, AI delivers instructional materials and provides feedback to students, while teachers monitor students' progress and deliver appropriate interventions. The findings indicate that the integration of voice-based AI micro-learning through a hybrid approach significantly improves elementary school students' reading comprehension. The study also reveals that students who engage with voice-based AI micro-learning within a hybrid approach demonstrate higher learning motivation and better reading abilities than those who rely on conventional instructional methods. This research is expected to contribute to the development of more effective and efficient reading instruction and to support the improvement of educational quality in Indonesia.

Keywords: Micro Learning, Reading Comprehension, Voice Based

Journal Homepage https://research.adra.ac.id/index.php/rpoc ISSN: (P: 3048-0078) - (E: 3048-1937)
How to cite: Mahayuni, Mahayuni., Mudinillah, A & Idris, A. (2025). Integration of AI Voice-Based Micro-Learning to Enhance Elementary School Students' Reading Comprehension. *Research Psychologie, Orientation et Conseil, 2*(6), 318–328. https://doi.org/10.70177/rpoc.v2i6.2864
Published by: Yayasan Adra Karima Hubbi

INTRODUCTION

Reading comprehension ability constitutes a fundamental foundation in the learning process at the elementary school level, as nearly all academic activities depend on students' capacity to understand written texts (Cheng et al., 2024; Dolean & Prodan, 2023; Hwang et al., 2024; Pang & Son, 2024; Yu & Tong, 2024). However, empirical realities indicate that many elementary school students in Indonesia continue to experience difficulties in comprehending reading passages, particularly when texts are presented in the form of lengthy narratives or contain unfamiliar vocabulary (Hogan & Payne, 2024; Liu, 2024; Petersen et al., 2024; Wenren et al., 2024; Zhao et al., 2024). Students' limited attention span, which on average lasts only 10–15 minutes, often renders reading instruction less effective when it is delivered through traditional methods that are monotonous and provide insufficiently varied stimuli.

This issue becomes increasingly critical given that reading ability influences not only students' academic achievement across subjects. Low levels of reading comprehension may undermine independent learning skills, hinder the development of digital literacy, and reduce students' confidence in engaging with texts(Cadime et al., 2024; Graham, 2024; Kimhi et al., 2023; Segal, 2023; Zhang & Jiang, 2023). On the other hand, the transformation of education toward the digital era necessitates learning innovations that are more responsive and adaptive. Therefore, research on the integration of Artificial Intelligence (AI) in reading instruction is essential as an alternative solution to enhance reading comprehension through approaches that are more engaging, flexible, and personalized.

One of the major challenges in improving students' reading comprehension lies in teachers' limited capacity to provide intensive support to each individual learner. Teachers often face large class sizes, time constraints, and highly diverse levels of student ability(Giguere et al., 2024; Lam et al., 2024; Mohammadi et al., 2023; Rico-Juan et al., 2024; Tong et al., 2023). This is where AI technology has the potential to offer a solution, particularly through voice-based micro-learning that segments instructional content into small, simple, and easily comprehensible units. By incorporating interactive audio narration, students can listen to explanations, repeat the material, and follow instructions more easily. This study is conducted to address the issue of limited teacher support and to identify instructional approaches that can encourage greater learner autonomy through the use of accessible technological support.

A voice-based micro-learning approach enables students to study texts gradually through short segments of instructional content delivered in the form of AI-driven audio(Anggia & Habók, 2023; Cai & Liao, 2024; Ju et al., 2024; Song & Reynolds, 2022; Wannagat et al., 2024). This format aligns with the characteristics of elementary school students, who tend to be more responsive to auditory stimulation and brief learning activities, thereby enhancing focus and learning motivation. Moreover, AI-powered audio can provide a more natural learning experience similar to a teacher reading texts aloud, while offering consistent voice quality, on-demand repetition, and easy personalization according to students' ability levels. The integration of AI is expected to address issues related to limited attention span, insufficient vocabulary reinforcement, and the lack of instructional variation in classroom-based reading instruction.

Previous studies have examined the use of AI in education; however, most have primarily focused on chatbot-based learning, digital gamification, or material recommendation systems. Research on text-to-speech (TTS) as a tool to support reading comprehension remains largely

limited to students with special educational needs or to foreign language learning contexts. Similarly, micro-learning approaches have been more commonly applied in higher education or professional training rather than at the elementary school level. To date, few studies have specifically investigated the integration of AI-based TTS within a micro-learning format to enhance elementary school students' reading comprehension, particularly in the context of Indonesian language literacy. This gap highlights the need for further research that combines audio-based AI technologies with micro-learning strategies to optimize students' reading abilities.

The innovation proposed in this study integrates two contemporary approaches, namely artificial intelligence based voice technology and the micro-learning instructional model. Recent advancements in AI have enabled the generation of highly natural and adaptive speech that can be tailored to children's characteristics, including reading intonation and speed. At the same time, micro-learning has evolved as an effective instructional method for enhancing retention and conceptual understanding through concise content segmentation. The combination of these approaches introduces a novel framework that remains underexplored in the context of foundational literacy instruction. The state of the art of this study lies in the use of interactive AI-based TTS integrated with a highly structured instructional design that is responsive to the cognitive needs of elementary school students.

Voice-based AI micro-learning is proposed in this study as an instructional model specifically designed to enhance elementary school students' reading comprehension. Unlike previous studies that have primarily utilized AI merely as a reading aid or as a means of providing audio materials, this research introduces a systematic approach that involves text segmentation, the development of micro-learning modules, and the use of adaptive AI-generated voice to support both intensive and extensive reading activities. The study also emphasizes students' independent and guided interaction with audio-based materials, thereby offering a personalized learning experience that has not been available in traditional instructional settings.

This research is expected to open new perspectives on the utilization of voice-based AI in literacy instruction at the elementary school level. Future directions include the development of more interactive learning platforms, integration with AI-driven learning analytics to monitor students' progress, and exploration of AI micro-learning applications for other language skills such as writing or speaking. Furthermore, this study is anticipated to serve as a foundation for subsequent research to examine the effectiveness of this approach on a broader scale, encompassing various grade levels and learning contexts. Thus, this innovation not only contributes to the academic discourse but also holds potential as a practical solution for improving the quality of foundational literacy in Indonesia.

RESEARCH METHOD

This study employed a mixed-methods approach to investigate the integration of AI voice-based micro-learning in enhancing elementary school students' reading comprehension. The research combined quantitative and qualitative methods in order to obtain both measurable outcomes and in-depth insights regarding the implementation of AI-assisted learning in classroom contexts. The integration of these two approaches enabled the researcher to examine not only the effectiveness of the intervention but also the experiences, perceptions, and

contextual factors influencing students' reading development and classroom engagement during the learning process.

Research Design

The research adopted a mixed-methods explanatory sequential design in which quantitative data collection and analysis were conducted in the initial phase, followed by qualitative exploration to elaborate, validate, and strengthen the quantitative findings. The quantitative phase utilized a quasi-experimental pretest posttest design to assess the effectiveness of integrating AI voice-based micro-learning in improving students' reading comprehension skills. The intervention consisted of short AI-generated instructional audio materials lasting approximately one to three minutes and delivered through micro-learning activities. Subsequently, the qualitative phase was carried out to explore the experiences of students and teachers during the implementation of AI technology and to identify factors that contributed to the improvement or limitation of reading achievement.

Research Target/Subject

The participants of this study consisted of fourth- and fifth-grade elementary school students enrolled in a school equipped with digital learning facilities. In the quantitative phase, approximately 25–35 students participated, which was considered adequate for conducting comparative analyses between pretest and posttest scores. In the qualitative phase, purposive sampling techniques were employed to select participants who could provide rich and relevant information regarding the implementation process. These participants included one Indonesian language teacher, six to eight students as key informants, and one school principal or curriculum vice principal who contributed perspectives related to institutional readiness and educational policy concerning AI integration. In addition, the AI application utilized in this research was verified to be safe, age-appropriate, and free from harmful or sensitive content for elementary school students.

Research Procedure

The research procedures were implemented in two interconnected stages following the explanatory sequential mixed-methods framework. During the quantitative phase, the researcher first designed AI-assisted voice-based micro-learning materials using Artificial Intelligence Text-to-Speech technology to generate concise audio learning content tailored to students' reading development levels. A reading comprehension test instrument measuring literal, inferential, and evaluative comprehension abilities was subsequently developed and administered as a pretest to identify students' initial reading performance. Following the pretest, students participated in AI-based micro-learning activities conducted over a period of three to four weeks, with each learning session lasting approximately 15–20 minutes. At the conclusion of the intervention, a posttest was administered to measure improvements in reading comprehension achievement, and the resulting data were analyzed statistically.

Instruments and Data Collection Techniques

Data collection in this study involved both quantitative and qualitative instruments to ensure comprehensive findings regarding the integration of AI voice-based micro-learning. Quantitative data were gathered through reading comprehension pretest posttest instruments and perception questionnaires designed to measure changes in students' reading achievement, learning motivation, interest, and perceived ease of using AI-generated audio materials. Meanwhile, qualitative data were collected through non-participant classroom observations, semi-structured interviews with teachers and students, and supporting documentation such as

field notes, photographs, and students' learning assignments. The use of multiple instruments and techniques enabled the researcher to obtain a holistic understanding of the effectiveness of AI-supported micro-learning as well as the classroom interactions and learning experiences that emerged during the implementation process.

Data Analysis Technique

The collected data were analyzed according to the characteristics of each data type. Quantitative data analysis involved several statistical procedures, including normality testing to determine data distribution, paired-sample t-tests to examine significant differences between pretest and posttest scores, and Wilcoxon tests as alternative analyses when the data were not normally distributed. In addition, effect size calculations were conducted to determine the magnitude of the intervention's influence on students' reading comprehension improvement. Qualitative data were analyzed using the interactive model proposed by Matthew B. Miles and A. Michael Huberman, which includes data reduction, data display, and conclusion drawing.

RESULTS AND DISCUSSION

Data analysis in this study employed the Partial Least Squares (PLS) method, which is a component- or variance-based form of Structural Equation Modeling (SEM). This method was selected because it is capable of estimating models with relatively small sample sizes, accommodating both reflective and formative indicators, and handling data that are not necessarily normally distributed. Data processing was conducted using SmartPLS version 4, a software package specifically designed to estimate measurement models (outer models) and structural models (inner models) in variance-based SEM analysis. The following path diagram illustrates the design of the outer and inner models used in this study:

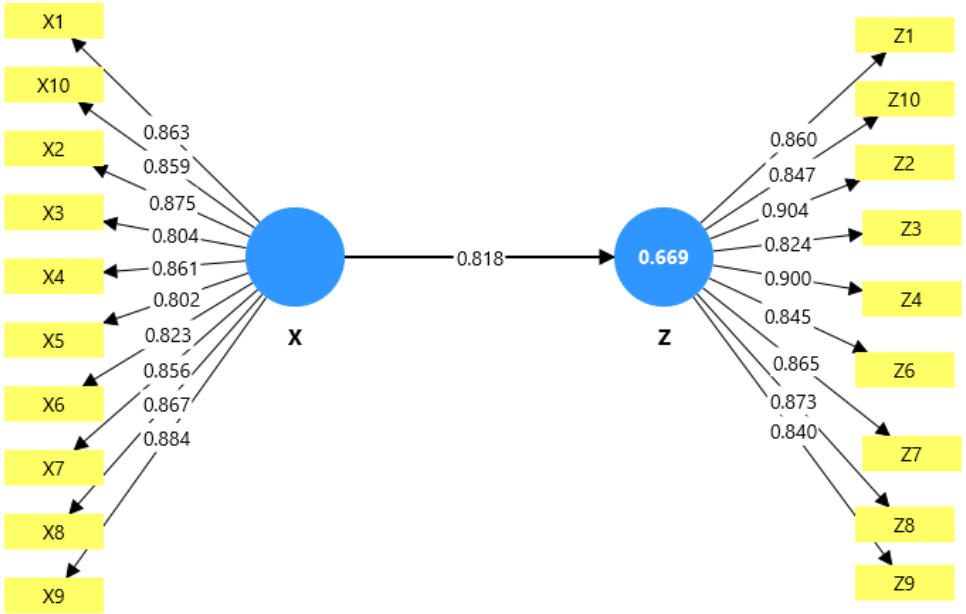

Figure 1. Outer Model and Inner Model

The evaluation of the PLS model was conducted in two stages, namely the assessment of the outer model and the inner model. The outer model evaluation involved several criteria, including convergent validity, discriminant validity, composite reliability, and Cronbach's alpha, to assess the validity and reliability of the measurement model. Meanwhile, the inner model evaluation was performed using a bootstrapping procedure to obtain *t*-statistic

parameters, which were used to predict causal relationships among latent variables. The evaluation results indicate that the proposed research model is valid and reliable and is capable of accurately predicting causal relationships among latent variables. Therefore, this model can be considered robust and suitable for generating accurate predictions regarding the relationships among latent variables.

The model evaluation was conducted by examining the significance of the relationships between variables using the Bootstrapping procedure. Hypothesis testing was performed by assessing the *t*-statistics and *p*-values. A research hypothesis is accepted if it meets the criteria of $p < 0.05$ and *t*-statistic > 1.96. The significance level applied is a one-tailed *t*-value of 1.96 at a 5% significance level. The following presents the model evaluation results based on Bootstrapping calculations in SmartPLS 4:

Tabel 1. Result for Inner Wights Hypotesis Research

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1 <- X	0.863	0.859	0.040	21.619	0.000
X10 <- X	0.859	0.866	0.050	17.213	0.000
X2 <- X	0.875	0.876	0.038	23.067	0.000
X3 <- X	0.804	0.807	0.073	11.033	0.000
X4 <- X	0.861	0.865	0.068	12.665	0.000
X5 <- X	0.802	0.802	0.083	9.673	0.000
X6 <- X	0.823	0.825	0.064	12.949	0.000
X7 <- X	0.856	0.858	0.045	19.147	0.000
X8 <- X	0.867	0.863	0.041	21.087	0.000
X9 <- X	0.884	0.884	0.036	24.743	0.000
Z1 <- Z	0.860	0.865	0.047	18.404	0.000
Z10 <- Z	0.847	0.849	0.040	21.123	0.000
Z2 <- Z	0.904	0.905	0.038	23.699	0.000
Z3 <- Z	0.824	0.826	0.071	11.663	0.000
Z4 <- Z	0.900	0.906	0.034	26.355	0.000

The results of the study indicate that the integration of Artificial Intelligence (AI) in voice-based micro-learning plays a significant role in enhancing elementary school students' reading comprehension. AI functions as a learning facilitator capable of delivering reading materials in the form of short, structured audio content tailored to the cognitive development level of elementary students. Presenting the material in micro-content segments allows students to process texts gradually, thereby supporting improvements in literal, inferential, and evaluative comprehension.

The data analysis indicates that all reading instruction indicators showed significant improvement following the implementation of voice-based AI micro-learning. The use of audio with clear intonation, controlled tempo, and adaptive repetition of material assisted students who were still struggling with decoding, vocabulary acquisition, and text comprehension. These findings suggest that AI functions not only as a medium for delivering instructional content but also as a learning companion that supports the ongoing development of reading comprehension skills.

This study is also supported by a systematic review of relevant studies published between 2022 and 2025 concerning the use of AI in elementary school reading instruction. The review

findings indicate that recent research trends emphasize the use of voice-based AI, micro-learning, and personalized learning as effective strategies for enhancing students' reading literacy. AI integration has been shown to improve learning focus, student engagement, and the quality of reading comprehension, particularly among students whose foundational reading skills are still developing.

Based on the questionnaire data, a total of 40 respondents participated in this study, consisting of elementary school teachers who implemented voice-based AI micro-learning reading instruction in their classrooms. The respondents were directly involved in the planning, execution, and evaluation of reading lessons using AI-based audio materials.

P1: Have you used audio-based or digital learning media in reading instruction? The questionnaire results indicate that some teachers have utilized audio media in reading instruction, while others still rely on conventional methods. This suggests that the use of audio technology in reading instruction still requires further reinforcement and support.

P2: What is your opinion on the use of voice-based AI micro-learning in reading instruction for elementary school students?

Respondents stated that voice-based AI reading instruction is highly beneficial for helping students understand the content of texts. AI is considered capable of enhancing students' focus, learning motivation, and comprehension because the material is presented in a concise, clear, and engaging manner. Furthermore, voice-based instruction is regarded as well-suited to the characteristics of elementary school students.

P3: What are the supporting factors for using voice-based AI micro-learning in reading instruction? The main supporting factors include the availability of technological devices, easy access to audio materials, teacher readiness, and school support. AI assists teachers in simplifying reading materials, providing varied instructional approaches, and facilitating more personalized learning tailored to students' abilities.

P4: What are the inhibiting factors in using voice-based AI micro-learning? The identified inhibiting factors include limited access to devices, internet connectivity quality, and teachers' proficiency in managing AI technology. Additionally, differences in students' reading abilities pose a challenge to the optimal implementation of audio-based learning.

P5: What has been your experience using AI-based audio to enhance students' reading comprehension?

Teachers reported that the use of AI-based audio helps students better understand texts, improves pronunciation, and enriches vocabulary. The learning process becomes more engaging and less monotonous, resulting in students being more active and enthusiastic in participating in reading activities.

Based on the findings of this study, it can be concluded that the integration of voice-based AI micro-learning is effective in enhancing elementary school students' reading comprehension. AI supports the reading learning process by delivering short, adaptive audio materials tailored to students' needs. Although some technical challenges and resource readiness issues remain, the implementation of voice-based AI holds significant potential for improving reading literacy in elementary schools. Therefore, it is essential to provide teacher training, strengthen infrastructure, and develop contextualized audio content to ensure that the implementation of voice-based AI micro-learning can be carried out optimally and sustainably.

The study results indicate that the integration of voice-based AI micro-learning has a positive impact on improving elementary school students' reading comprehension. Based on

the pretest and posttest results, notable improvements were observed across three key aspects: literal, inferential, and evaluative comprehension. The greatest improvement occurred in literal comprehension, suggesting that AI-based audio effectively reinforces the retention of explicit information through the dual coding principle. Interviews and observations supported these quantitative findings, showing that students found it easier to understand instructions and text content when listening to AI-generated speech with stable intonation. Teachers also reported that using AI reduced the need to repeat instructions and allowed more time to focus on individual student guidance. However, some unexpected dynamics emerged, including attention distractions caused by audio, dependency on technology, and minimal gains among high-ability students. Additionally, some students with low reading interest demonstrated only limited progress despite the AI intervention.

Compared to previous literature, this study demonstrates both consistency and notable differences. Consistent with prior research, voice-based AI has been shown to enhance literal comprehension and provide significant benefits for auditory learners. However, the findings of this study differ from some studies suggesting that micro-learning is less effective for elementary students and may reduce teacher–student interaction. In the context of this research, micro-learning proved effective because the short audio duration aligns with children's attention span, while teachers found it helpful for delivering differentiated instruction. Qualitative findings also emphasize that improvements in inferential and evaluative comprehension were influenced not only by the audio content but also by increased student motivation and engagement with AI technology. Nevertheless, this study has limitations, including the short duration of the intervention, a small sample size, wide variation in reading abilities, and potential interview bias. Technical challenges, such as unstable devices, also affected learning outcomes.

This study provides a comprehensive overview indicating that the integration of voice-based AI micro-learning is a promising innovation for enhancing elementary students' reading skills, particularly in literal and inferential comprehension. The mixed methods analysis shows that improvements occurred not only in measurable scores but also through more engaging, flexible learning dynamics that allow students greater opportunities for independent learning. Although the findings demonstrate the effectiveness of the intervention, its implementation must still consider students' diverse abilities, intrinsic motivation, and the balanced use of technology to avoid diminishing reading autonomy. For future research, it is recommended to expand the sample size, extend the intervention duration, develop personalized AI voice features, and investigate its impact on more complex aspects of reading. In this way, the study contributes to enriching the literature on AI integration in foundational literacy instruction while opening avenues for more in-depth subsequent research.

CONCLUSION

Artificial Intelligence (AI) plays a strategic role as a primary facilitator in supporting the implementation of voice-based micro-learning to enhance elementary school students' reading comprehension. Through text-to-speech features and learning analytics, AI can deliver reading materials in short durations, using simple language and clear intonation, aligning with students' cognitive developmental characteristics. AI assists in simplifying complex information into small, digestible units (micro-content), allowing students to process texts gradually and focus more on key information. The controlled-tempo audio presentation enables students to better

understand texts, particularly those who still face challenges in decoding or basic vocabulary acquisition. Thus, voice-based AI integration directly contributes to improvements in literal, inferential, and evaluative comprehension during the reading process.

AI supports the simplification of learning materials while also enhancing the reading learning process through automated and personalized feedback. The AI system can correct pronunciation errors, provide emphasis on specific words, and help students better recognize text structure. This accelerates students' comprehension and prevents misconceptions in understanding text meaning. Voice-based micro-learning also boosts learning motivation by presenting content in a concise, interactive, and engaging manner, encouraging students to study more consistently. In this context, AI functions not merely as an audio delivery medium but as a learning companion that continuously supports students in developing their reading skills.

The effectiveness of integrating voice-based AI micro-learning is still influenced by various supporting factors, including teacher and school readiness, device quality, and students' digital literacy. Teachers need to understand how to appropriately integrate AI into reading instruction to avoid excessive technology dependence. Additionally, AI-generated audio content must be tailored to the elementary school language learning context in terms of difficulty level, narrative length, and delivery style. Challenges such as device accessibility, network limitations, and variations in students' abilities must also be considered to ensure effective implementation. Therefore, the successful integration of voice-based AI micro-learning requires teacher training, infrastructure readiness, and the development of content aligned with the characteristics of elementary school students.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Anggia, H., & Habók, A. (2023). Textual complexity adjustments to the English reading comprehension test for undergraduate EFL students. *Heliyon*, *9*(1), e12891. https://doi.org/https://doi.org/10.1016/j.heliyon.2023.e12891

Cadime, I., Freitas, T., Martín-Aragoneses, M. T., & Ribeiro, I. (2024). Does reading fluency mediate the relationship between cognitive-linguistic skills and reading comprehension? A study in European Portuguese. *Cognitive Development*, *71*, 101490. https://doi.org/https://doi.org/10.1016/j.cogdev.2024.101490

Cai, M., & Liao, X. (2024). The relationship between vocabulary depth knowledge, word reading, and reading comprehension in Chinese. *Journal of Experimental Child Psychology*, *244*, 105951. https://doi.org/https://doi.org/10.1016/j.jecp.2024.105951

Cheng, X., Yin, L., Lin, C., Shi, Z., Zheng, H., Zhu, L., Liu, X., Chen, K., & Dong, R. (2024). Chatbot dialogic reading boosts comprehension for Chinese kindergarteners with higher language skills. *Journal of Experimental Child Psychology*, *240*, 105842. https://doi.org/https://doi.org/10.1016/j.jecp.2023.105842

Dolean, D. D., & Prodan, N. (2023). Let's eat grandma: Awareness of punctuation and capitalization rules' violations predicts the development of reading comprehension. *Learning and Instruction*, *86*, 101780. https://doi.org/https://doi.org/10.1016/j.learninstruc.2023.101780

Giguere, D., Tulloch, M. K., Core, C., & Hoff, E. (2024). Early skills that predict English reading ability: A longitudinal study of bilingual children from 5 to 10 years. *Journal of Experimental Child Psychology*, *246*, 105993. https://doi.org/https://doi.org/10.1016/j.jecp.2024.105993

Graham, K. M. (2024). Assessing the impact of pre-lecture reading compliance on lecture comprehension in English-medium instruction courses. *Journal of English for Academic Purposes*, *68*, 101367. https://doi.org/https://doi.org/10.1016/j.jeap.2024.101367

Hogan, E., & Payne, B. (2024). A mixed methods study of teachers' use of feedback within middle school social studies classrooms to promote reading comprehension. *Learning and Instruction*, *92*, 101938. https://doi.org/https://doi.org/10.1016/j.learninstruc.2024.101938

Hwang, H., Choi, S., Guha, M., McMaster, K., Harsch, R., & Kendeou, P. (2024). Indirect and direct contributions of executive functions to reading comprehension. *Journal of Experimental Child Psychology*, *243*, 105925. https://doi.org/https://doi.org/10.1016/j.jecp.2024.105925

Ju, P., Zhou, Z., Xie, Y., Hui, J., & Yang, X. (2024). Music training influences online temporal order processing during reading comprehension. *Acta Psychologica*, *248*, 104340. https://doi.org/https://doi.org/10.1016/j.actpsy.2024.104340

Kimhi, Y., Mishkin, I. K., & Bauminger-Zviely, N. (2023). Reading comprehension strategies for expository texts: Children with and without ASD. *Research in Autism Spectrum Disorders*, *105*, 102169. https://doi.org/https://doi.org/10.1016/j.rasd.2023.102169

Lam, J. H. Y., Leachman, M. A., & Pratt, A. S. (2024). A systematic review of factors that impact reading comprehension in children with developmental language disorders. *Research in Developmental Disabilities*, *149*, 104731. https://doi.org/https://doi.org/10.1016/j.ridd.2024.104731

Liu, D. (2024). Mixed inference machine reading comprehension method based on symbolic logic. *Intelligent Systems with Applications*, *21*, 200307. https://doi.org/https://doi.org/10.1016/j.iswa.2023.200307

Mohammadi, R. R., Saeidi, M., & Abdollahi, A. (2023). Modelling the interrelationships among self-regulated learning components, critical thinking and reading comprehension by PLS-SEM: A mixed methods study. *System*, *117*, 103120. https://doi.org/https://doi.org/10.1016/j.system.2023.103120

Pang, D., & Son, S. (2024). The relationship between morphological awareness and reading comprehension among early grade Chinese children with reading difficulties: A path analysis. *Contemporary Educational Psychology*, *77*, 102268. https://doi.org/https://doi.org/10.1016/j.cedpsych.2024.102268

Petersen, D. B., Swope, K. L., Konishi-Therkildsen, A., Young, E. L., Brock, C., & Spencer, T. D. (2024). Evidence of a limited relationship between reading fluency and reading comprehension of academic language. *Journal of School Psychology*, *107*, 101367. https://doi.org/https://doi.org/10.1016/j.jsp.2024.101367

Rico-Juan, J. R., Peña-Acuña, B., & Navarro-Martinez, O. (2024). Holistic exploration of reading comprehension skills, technology and socioeconomic factors in Spanish teenagers. *Heliyon*, *10*(12), e32637. https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e32637

Segal, D. (2023). Sustained attention plays a critical role in reading comprehension of adults with and without ADHD. *Learning and Individual Differences*, *105*, 102300. https://doi.org/https://doi.org/10.1016/j.lindif.2023.102300

Song, T., & Reynolds, B. L. (2022). The effect of lexical coverage on L2 learners' reading comprehension of narrative and expository genres. *Journal of English for Academic Purposes*, *59*, 101154. https://doi.org/https://doi.org/10.1016/j.jeap.2022.101154

Tong, X., Chiu, M. M., & Tong, S. X. (2023). Synergetic effects of phonological awareness, vocabulary, and word reading on bilingual children's reading comprehension: A three-year study. *Contemporary Educational Psychology*, *73*, 102153. https://doi.org/https://doi.org/10.1016/j.cedpsych.2023.102153

Wannagat, W., Nieding, G., & Tibken, C. (2024). Age-related decline of metacognitive comprehension monitoring in adults aged 50 and older: Effects of cognitive abilities and educational attainment. *Cognitive Development*, *70*, 101440. https://doi.org/https://doi.org/10.1016/j.cogdev.2024.101440

Wenren, S., Ding, W., Wang, Z., Xia, Y., Xie, R., & Li, W. (2024). Reciprocal effects between reading comprehension and emotional cognitive ability. *Learning and Individual Differences*, *109*, 102398. https://doi.org/https://doi.org/10.1016/j.lindif.2023.102398

Yu, L., & Tong, X. (2024). Emotional intelligence and reading comprehension: Examining mediating roles of word reading, vocabulary, and working memory. *Learning and Individual Differences*, *116*, 102574. https://doi.org/https://doi.org/10.1016/j.lindif.2024.102574

Zhang, H., & Jiang, C. (2023). Verb-driven machine reading comprehension with dual-graph neural network. *Pattern Recognition Letters*, *176*, 223–229. https://doi.org/https://doi.org/10.1016/j.patrec.2023.11.008

Zhao, Y., Wu, X., & Cheng, Y. (2024). Examining factors and mechanisms of reading comprehension and reading fluency: Longitudinal evidence for Chinese children from grade 1 to grade 6. *Learning and Individual Differences*, *113*, 102467. https://doi.org/https://doi.org/10.1016/j.lindif.2024.102467