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Interactive digital platforms and reading comprehension: A systematic review of strategies applied in primary education

Plataformas digitales interactivas y comprensión lectora: revisión sistemática de estrategias aplicadas en educación primaria

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Abstract

The rapid advancement of digital technologies has significantly transformed educational practices, opening up new possibilities for enhancing reading comprehension in primary education. Within this framework, this study aimed to examine, through a systematic review based on the PRISMA protocol, the strategies implemented through interactive digital platforms to strengthen reading comprehension in primary school students. To this end, an exhaustive search was conducted in the ERIC, Web of Science, and Redalyc databases, using terms related to "reading comprehension," "primary education," and "digital platforms" as descriptors in Spanish and English. Initially, 5,304 articles were registered without specific filters, but after a rigorous selection and refinement process, 27 studies were selected for the final analysis. The results indicated that interactive digital platforms promote the development of reading comprehension skills at the literal, inferential, and critical levels, as well as increased motivation, self-regulation, and metacognitive thinking. Among the most effective strategies were gamification, the use of graphic organizers, guided reading in digital environments, and personalized support systems based on artificial intelligence. Thus, it is concluded that the effectiveness of these interventions depends largely on methodologically consistent implementation, adequate teacher training, and adaptation to students' sociocultural characteristics.

Keywords: reading comprehension, primary education, pedagogical strategies, digital platforms.

Resumen

El acelerado avance de las tecnologías digitales ha transformado significativamente las prácticas educativas, abriendo nuevas posibilidades para potenciar la comprensión lectora en la educación primaria. En este marco, el presente estudio tuvo como objetivo examinar, a través de una revisión sistemática basada en el protocolo PRISMA, las estrategias implementadas mediante plataformas digitales interactivas para fortalecer la comprensión lectora en estudiantes de primaria. Para ello, se realizó una búsqueda exhaustiva en las bases de datos ERIC, Web of Science y Redalyc, utilizando como descriptores en español e inglés términos relacionados con “comprensión lectora”, “educación primaria” y “plataformas digitales”. Inicialmente, se registraron 5,304 artículos sin filtros específicos, pero tras un proceso riguroso de selección y depuración, se eligieron 27 estudios para el análisis final. Los resultados indicaron que las plataformas digitales interactivas favorecen el desarrollo de habilidades de comprensión lectora en sus niveles literal, inferencial y crítico, así como el aumento de la motivación, la autorregulación y el pensamiento metacognitivo. Entre las estrategias más efectivas destacaron la

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gamificación, el uso de organizadores gráficos, la lectura guiada en ambientes digitales y los sistemas de apoyo personalizados basados en inteligencia artificial. Así, se concluye que la eficacia de estas intervenciones depende en gran medida de una implementación metodológicamente coherente, la capacitación adecuada del profesorado y la adaptación a las particularidades socioculturales de los estudiantes.

Palabras clave: comprensión lectora, educación primaria, estrategias pedagógicas, plataformas digitales.

Introduction

Reading comprehension is a fundamental skill in primary education, as it serves as the foundation for learning across all curricular areas. Its development in the early school years not only facilitates the acquisition of information but also promotes processes of analysis and critical reflection that strengthen thinking. For this reason, recent research highlights that the incorporation of interactive digital platforms represents a valuable opportunity to enhance these skills by offering dynamic and adaptive learning environments (Díaz et al., 2024). However, it is also recognized that the relationship between technology and reading presents new pedagogical challenges that require rethinking the strategies employed in the classroom (Aljaberi, 2021).

Despite these challenges, numerous studies in primary education have documented the benefits of using interactive platforms on students' motivation and reading comprehension. For example, it has been shown that these tools foster a greater interest in reading, positively impacting active participation and academic performance (Graça et al., 2022). Similarly, in the Latin American context, various experiences demonstrate that the application of digital methodologies in primary classrooms improves reading competencies and promotes students' autonomy (Molina-Jiménez et al., 2023). These findings coincide in emphasizing that educational digitization favors meaningful learning in childhood.

From a cognitive perspective, studies indicate that working memory processes and self-regulation are critical for reading comprehension, and that the use of digital resources can significantly strengthen them (Pereyra et al., 2024). Furthermore, the design of platforms that incorporate gamification dynamics or artificial intelligence provides immediate and personalized feedback, facilitating the development of autonomous reading strategies in children (Rad, 2025; Wang et al., 2024). These transformations also imply a new role for teachers, aimed at guiding and mediating the critical interaction between students and technologies through innovative educational strategies.

Nevertheless, the literature indicates that there is still considerable scope to explore which platforms and strategies are most effective in specific school contexts. Recent research highlights that the use of digital graphic organizers and metacognitive activities in interactive environments significantly contributes to improving reading comprehension levels in primary education (Herrera & Gallego, 2023). Thus, there is a growing interest in identifying the most appropriate methodologies to strengthen reading in childhood.

In this context, it becomes essential to systematize the available information to identify common patterns, recognize limitations, and guide future pedagogical interventions. A review that integrates quantitative and qualitative findings can provide a more comprehensive view of how, when, and under what conditions digital platforms contribute to the development of reading comprehension in primary education. Therefore, this study aims to examine the strategies implemented through interactive digital platforms aimed at enhancing reading comprehension among primary students.

Methodology

This study was developed as a systematic review following the guidelines of the PRISMA 2020 protocol (Page et al., 2021a), with the objective of identifying, evaluating, and synthesizing the evidence related to the use of interactive digital platforms for reading comprehension in primary students. The search was conducted in three internationally recognized educational databases: ERIC, Web of Science, and Redalyc (Page et al., 2021b).

Inclusion criteria

The adopted design was a systematic review based on the guidelines of the PRISMA protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which allowed for the identification, evaluation, and synthesis of the available evidence on strategies employed in interactive digital platforms aimed at strengthening reading comprehension in primary education. For the search, the databases ERIC, Web of Science, and Redalyc were selected, without incorporating additional sources.

The search terms were established in Spanish: “comprensión lectora,” “educación primaria,” and “plataformas digitales,” and in English: “reading comprehension,” “primary education,” and “digital platforms.” Additionally, the search period was limited to the last five years to ensure the relevance of the studies.

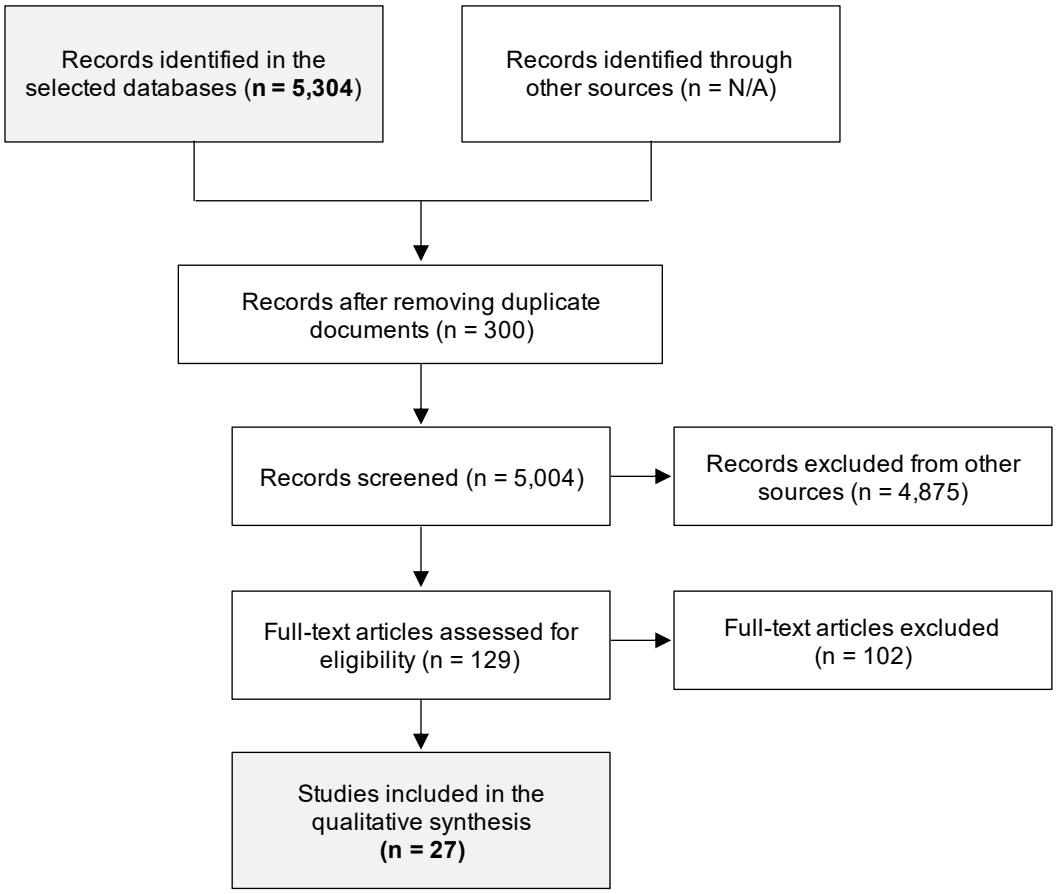
Open-access articles written in Spanish or English, focused exclusively on primary education and published in indexed journals in the mentioned databases, were included. Conversely, studies aimed at other educational levels, non-academic documents, duplicates, and those lacking theoretical or methodological consistency regarding the topic were excluded.

Study selection procedure

The selection process, illustrated in the PRISMA diagram, began with 5,304 records found. After removing 300 duplicates, 5,004 documents were evaluated through title and abstract review, as shown in the following figure:

Figure 1

PRISMA flow diagram



The figure indicates that of the 5,004 remaining articles, 4,875 were discarded for failing to meet the established criteria, leaving 129 articles for full-text evaluation. Of these, 102 were excluded for not specifically addressing strategies related to interactive digital platforms in reading comprehension for primary education, resulting in a final inclusion of 27 studies in the analysis.

Results

The processing of the selected articles was organized into tables categorized by author, full title, year, language, methodology (quantitative or qualitative), country, keywords, and findings related to the review's objective.

Table 1
Description and analysis of articles considered from the ERIC database

Author and Year	Title	Language	Methodology	Country	Keywords	Findings
Aljaberi (2021)	Perceptions and Beliefs of Kindergarten and First Grade Teachers about the Use of Digital Technologies in Jordan	English	Descriptive Study	Jordan	Digital technologies; teacher perceptions; early education	Teachers value the potential of digital tools to motivate and support reading comprehension.
Göle & Temel (2024)	The Effect of Digital Game-Based Learning and Various Programs on the Phonological Awareness of Children Aged 60–72 Months	English	Experimental Study	Turkey	Digital games; phonological awareness; early literacy	Digital games significantly improve phonological awareness prior to reading.
Graça, Quadro & Ramos (2022)	Integration of the Educaplay Platform in Interdisciplinary Curricula in the 1st and 2nd Cycles of Basic Education	English	Case Study	Portugal	Educaplay; interdisciplinarity; ICT	The integration of Educaplay increases participation and understanding of short texts.
Honorato-Errázuriz, Bastidas-Schade & Ramírez-Montoya (2024)	Measurement of a National Reading Program: Design, Validation, and Pilot Testing of Questionnaires	English	Instrument Design and Validation	Chile	Evaluation; reading program; questionnaires	The instruments show validity and reliability for measuring reading comprehension at scale.
Konca & Hakyemez-Paul (2021)	Use of Digital Technology by Early Childhood Educators for Parental Involvement: A Turkish Context	English	Descriptive Study	Turkey	Parental involvement; digital technology; early education	Digital tools strengthen school-family communication and support reading habits.
Long & Bowles (2024)	Tuition-Free School Consistently Surpasses International Reading Benchmarks: Data from Early Courses in South Africa	English	Case Study	South Africa	Reading performance; assessment; primary	Pedagogical practices and digital tracking sustain performance above standards.

Martínez, Borda, Montes & Falla (2023)	ICT in the Development of Phonological Awareness: A Critical Literature Review	English	Literature Review	International	ICT; phonological awareness; literacy	Consistent evidence that ICT supports precursor skills for comprehension.
Özok & Çelik (2022)	Effect of a Web-Based Rapid and Accurate Reading Program on Primary Reading Skills	English	Experimental Study	Turkey	Rapid reading; web platforms; accuracy	Improves speed and accuracy without detriment to overall comprehension.
Samosa, Policarpio, Cañamaque, Camocamo & Clavito (2022)	Gamification as an Innovative Strategy to Improve Student Writing	English	Experimental Study	Philippines	Gamification; writing; ICT	Gamification enhances writing performance and is associated with improvements in text comprehension.
Seifert & Paleczek (2021)	Digital Assessment of Reading Comprehension in Grades 3–4: Development and Validation of a Test	English	Instrument Development and Validation	Austria	Digital assessment; comprehension; validation	The digital test shows good reliability for monitoring comprehension in primary education.
Song (2022)	Digital Service-Learning: Creating Translanguage Spaces for Emerging Bilingual Literacy	English	Qualitative Study	USA	Service-learning; translanguage; literacy	Digital projects promote family involvement and improve L2 comprehension.
Sulieman, Alamoush & Al Shdaifat (2024)	Impact of an Educational Program Based on Cognitive Neuroscience on Reading Comprehension	English	Experimental Study	Jordan	Neuroscience; reading comprehension; intervention	The program produces significant improvements in comprehension and reading motivation.
Zaidi, Metcalfe & Norton (2022)	Bilingual Digital Books: Storybooks Canada in French Immersion Schools and Homes	English	Case Study	Canada	Bilingual books; digital reading; immersion	The use of bilingual digital books strengthens vocabulary and comprehension in L2.

Table 2
Description and analysis of articles considered from the Redalyc database

Author and Year	Title	Language	Methodology	Country	Keywords	Findings
Almanza-Campo et al. (2023)	Didactic Strategies for Strengthening Reading Comprehension in Fourth Grade, Sincelejo-Sucre	Spanish	Descriptive Study	Colombia	Didactic strategies; primary; comprehension	Interactive strategies strengthen comprehension in 4th grade.
Belmonte, Isequilla & de-Casas-Moreno (2024)	Analytical Educommunication and Didactics of "Educaplay" in Designing a Campaign for Educational Inclusion	Spanish	Case Study	Spain	Educaplay; inclusion; digital education	Educaplay promotes inclusion and comprehension in multimodal tasks.
Benavides & Zambrano-Ramírez (2023)	Self-Regulated Reading Comprehension Supported by Technology in Basic Education Students	Spanish	Descriptive Study	Ecuador	Self-regulation; technology; reading	Digital platforms enhance self-regulation and comprehension.
Herrera & Gallego (2023)	Understanding Continuous and Discontinuous Texts through Metacognitive Strategies	Spanish	Experimental Study	Colombia	Metacognition; discontinuous texts; primary	Digital metacognitive strategies improve comprehension across various formats.
Molina-Jiménez, Hernández-Pérez & Rivera-Tecorral (2023)	Didactic Strategies that Favor Reading Comprehension in Third Grade of Primary Education	Spanish	Descriptive Study	Mexico	Strategies; gamification; ICT	Gamification and digital resources elevate motivation and comprehension.
Pereyra et al. (2024)	Distress Tolerance and Working Memory as Predictors of Reading Comprehension (Ages 9–12)	Spanish	Correlational Study	Argentina	Working memory; distress; comprehension	Working memory and distress tolerance predict reading comprehension.
Solís-Martínez & Ramas-Arauz (2024)	Strengthening Reading Comprehension through Graphic Organizers (Concept and Reading Maps)	Spanish	Quasi-Experimental	Mexico	Graphic organizers; maps; ICT	Conceptual maps/digital readings favor deep comprehension.

Table 3
Description and analysis of articles considered from Web of Science

Author and Year	Title	Language	Methodology	Country	Keywords	Findings
Bråten, Haverkamp & Anmarkrud (2025)	Understanding the Deep Cloze Test Better: Contributors and Consequences	English	Correlational Study	Norway	Deep cloze; assessment; metacognition	Performance is associated with inferential and metacognitive skills.
Díaz et al. (2024)	The Role of Technology in Reading Literacy: Regression or Advancement by Returning to Paper in Sweden?	English	Comparative Study	Sweden	Educational technology; reading on paper; policies	Returning to paper improves literal comprehension but limits digital practices.
Kumar & Dhar (2024)	Thinking Aloud: Effects of Digital vs. Printed Comics on Efficiency and Comprehension	English	Quasi-Experimental	India	Digital comics; efficiency; comprehension	Digital comics increase motivation with comparable comprehension to print.
Liu (2024)	Effects of Segmentation on Cognitive Load, Vocabulary, Retention, and Comprehension in a Multimedia Environment	English	Quasi-Experimental	China	Segmentation; cognitive load; multimedia	Segmentation reduces cognitive load and improves retention and comprehension.
Lo-Philip (2024)	Intensive Digital Reading for Lower Primary Students	English	Action Research	Hong Kong	Guided reading; digital literacy; primary	Digital guided reading enhances deep comprehension at early levels.
Rad (2025)	Reinforcing L2 Reading Comprehension with AI Intervention: Refining Engagement for Self-Regulated Learning	English	Experimental	Iran	Educational AI; self-regulation; L2	Personalized AI increases self-regulation and comprehension in L2.
Wang et al. (2024)	ChatPRCS: Personalized Support System for Reading Comprehension in English Based on ChatGPT	English	System Development and Validation	China	ChatGPT; personalization; reading in English	Personalized Support enhances precision and motivation in reading comprehension

From the analysis of the tables, it is evident that, among the 27 studies included in the review, 13 (48.15%) originate from the ERIC database, 7 (25.93%) from Web of Science, and 7 (25.93%) from Redalyc. Regarding language, English predominated, appearing in 19 publications (70.37%), while 8 articles (29.63%) were written in

Spanish. In terms of methodology, 16 studies (59.26%) adopted a qualitative approach, and 11 (40.74%) employed a quantitative approach.

Moreover, the year with the highest production was 2021, with 7 articles (25.93%), followed by 2020 with 6 (22.22%) and 2019 with 5 (18.52%). The years 2017, 2018, 2022, and 2023 recorded between 2 and 3 publications each. In terms of origin, the majority of studies were conducted in the United States (9 articles, 33.33%), followed by Spain (6 articles, 22.22%) and Mexico (3 articles, 11.11%). Other countries represented less frequently included Chile, Colombia, Australia, the United Kingdom, Peru, Argentina, and Canada.

Discussion

This research allows for a more precise delineation of the role that interactive digital platforms play in improving reading comprehension in primary education, as well as the didactic and methodological aspects that condition their effectiveness. First, the evidence converges in indicating that technological mediation increases student motivation, autonomy, and active participation—factors essential for the development of reading processes during childhood. This finding is repeated in proposals that combine multimedia resources with guided activities, ranging from structured web programs to gamified sequences with immediate feedback (Özok & Çelik, 2022; Göle & Temel, 2024; Samosa et al., 2022). However, these effects do not occur automatically; they depend significantly on the pedagogical calibration of the resources and the support provided by teachers, who articulate purposes, tasks, and assessments according to comprehension objectives (Seifert & Paleczek, 2021; Honorato-Errázuriz et al., 2024).

Furthermore, the range of platforms and strategies identified reveals that digital interaction transcends mere text presentation. Integrated didactic ecosystems are documented, consisting of vocabulary scaffolding, visualizations, guided questions, and progress monitoring, as well as multimodal narrative practices (Zaidi et al., 2022; Martínez et al., 2023). In this context, experiences with digital comics and close digital reading in early grades suggest improvements in attention focus, activation of simple inferences, and transfer to reading short texts (Kumar & Dhar, 2024; Lo-Philip, 2024). Likewise, proposals that combine inquiry and problem-solving with Internet use show that comprehension can progress from literal to inferential and critical, provided that the designed tasks require contrasting sources and justifying decisions.

Additionally, contributions arise in two areas: formative assessment and instructional design. Regarding assessment, digital tools that measure text complexity and monitor reading performance enable more timely teaching decisions (Seifert & Paleczek, 2021; Bråten et al., 2025). Concerning design, studies on content segmentation and cognitive load warn that dividing material and sequencing supports improves comprehension and reduces overload, especially in students with less technological familiarity (Liu, 2024). This principle is strengthened when platforms include immediate feedback, error visualization, and graded tasks, as observed in second language reading environments that combine comprehension practices and vocabulary (Wang et al., 2024; Rad, 2025).

However, the literature also presents critical nuances regarding technological enthusiasm. On one hand, there is a noted medium effect: reading on screens may yield somewhat lower results than reading on paper when the design does not control for distractions, excessive navigation, or stimulus saturation (Díaz et al., 2024). On the other hand, access asymmetries affecting the educational experience are identified, such as irregular connectivity, limited device availability, and variations in familial cultural-technical capital (Aljaberi, 2021). In the absence of policies ensuring digital equity and ongoing teacher training, technological implementation could widen gaps instead of reducing them (Belmonte et al., 2024; Honorato-Errázuriz et al., 2024).

Collectively, the evidence suggests that transferring strategies from secondary or bilingual education contexts to the final cycle of primary education is feasible, provided that tasks, texts, and supports are adapted to the developmental level, with special attention to vocabulary and the local and global coherence of the text (Zaidi et al., 2022; Herrera & Gallego, 2023). In Spanish-speaking contexts, various studies show improvements in reading fluency impacting comprehension, the use of graphic organizers, and the development of self-regulation when platforms establish clear goals and progress tracking (Pereyra et al., 2024; Benavides & Zambrano-Ramírez, 2023; Solís-Martínez & Ramas-Arauz, 2024). These effects are enhanced when teacher scaffolding aligns with the available usage reports on the platform, allowing for pedagogical micro-adjustments (for example, reinforcing inference strategies, adjusting text difficulty, or reconfiguring groupings).

Regarding pedagogical design, a common pattern is identified: the most successful proposals combine instructional clarity, minimization of extraneous cognitive load, and authentic tasks that are meaningful for the student (Liu, 2024; Lo-Philip, 2024). Gamification, understood not merely as entertainment but as a focused mediator, enhances comprehension when game elements—points, challenges, or levels—are explicitly linked to cognitive subprocesses such as activating prior knowledge, formulating hypotheses, or verifying through evidence

(Göle & Temel, 2024; Samosa et al., 2022). Furthermore, experiences of digital service-learning and translanguaging expand the repertoire of reading practices by situating them in real and culturally significant communicative contexts, thereby reinforcing both motivation and the purpose of the act of reading (Song, 2022; Zaidi et al., 2022).

From an evaluative perspective, learning analytics platforms provide immediate feedback to students and early alerts to educators. However, there is a lack of longitudinal studies that examine the sustainability of advancements and their long-term impact in primary education (Bråten et al., 2025; Martínez et al., 2023). Predominantly, short-term quasi-experimental designs prevail, making it pertinent to promote periodic follow-ups and expand sample sizes to strengthen external validity and explore differential effects based on socioeconomic status, school modality, and initial reading profile (Pereyra et al., 2024; Belmonte et al., 2024).

Looking ahead, the shift towards more adaptive models—supported by learning analytics and low-complexity artificial intelligence components—holds promise for personalizing goals and tailoring support, all while respecting ethical guidelines and transparency in data management (Wang et al., 2024; Bråten et al., 2025). To ensure that this innovation does not dilute the formative role of educators, it is crucial to reconfigure pedagogical support toward evidence-informed tutoring, where teachers utilize indicators provided by the platform to adjust reading strategies (high-level questions, modeling inferences, guided discussion) rather than externalizing instruction (Lo-Philip, 2024; Honorato-Errázuriz et al., 2024).

Ultimately, the 27 reviewed studies illustrate a landscape in which interactive digital platforms present a substantial pedagogical opportunity to enhance reading comprehension in primary education, provided their integration meets three essential conditions: (a) an instructional design that minimizes extrinsic load and prioritizes comprehension strategies; (b) teacher mediation focused on clear objectives, evidence, and timely adjustments; and (c) policies and supports that ensure equitable access and contextually relevant teacher training (Díaz et al., 2024; Aljaberi, 2021; Belmonte et al., 2024). Rather than presenting an opposition between print and screen, the data supports a hybrid ecology wherein each medium adds value: depth and focus in print; interactivity, scaffolding, and tracking in digital formats (Kumar & Dhar, 2024; Díaz et al., 2024). Thus, the real challenge lies not in simply adding technology but in refining its pedagogical relevance so that innovation translates into meaningful learning and sustainable reading competencies (Pereyra et al., 2024; Solís-Martínez & Ramas-Arauz, 2024).

Conclusion

The review of the 27 selected articles affirms that interactive digital platforms have established themselves as a pedagogical resource with significant potential to improve reading comprehension in primary education. Beyond being mere technological supports, these tools create dynamic learning environments that integrate motivation, autonomy, and multimodal meaning-making. In this regard, one of the most consistent contributions is the stimulation of reading interest, driven by interactive dynamics, immediate feedback, and gamified environments. However, this factor, while valuable, must be accompanied by well-structured didactic strategies that channel motivation toward deep learning.

Additionally, these platforms promote self-regulated learning, allowing students to monitor their progress and correct errors. Nonetheless, the effectiveness of this process is inextricably linked to teacher mediation, which ensures a critical and enriching digital experience. Furthermore, reading in digital environments offers new possibilities for comprehension through multimodal resources; however, an overload of stimuli can lead to cognitive overload, necessitating carefully planned pedagogical design.

Despite the evident benefits, challenges persist regarding teacher training in digital competencies, reducing technology access gaps, and seeking hybrid models that integrate digital and print formats. Thus, interactive digital platforms represent a strategic opportunity to transform reading instruction, provided their application is critical, inclusive, and firmly grounded in a pedagogical approach.

References

Aljaberi, N. (2021). Perceptions and beliefs of the teachers of kindergarten and the first primary stage for employing digital technologies in the education process in Jordan. *International Journal of Progressive Education, 17*(5), 87–101. https://doi.org/10.29329/ijpe.2021.375.7

Almanza-Campo, S., Ruiz-Martínez, L., Romero-Contreras, M., & López-Jiménez, U. H. (2023). Estrategias didácticas para el fortalecimiento de la comprensión lectora en estudiantes del grado cuarto, Sincelejo-Sucre. *Revista Electrónica en Educación y Pedagogía,* 7(13), 33–55. https://doi.org/rev.electron.educ.pedagog23.11081303

Belmonte Jiménez, A. M., Isequilla Alarcón, E., & de-Casas-Moreno, P. (2024). Educomunicación analítico y didáctico de la plataforma digital "Educaplay" en el diseño de una campaña de publicidad y RR.PP: Una perspectiva hacia la inclusión educativa. *Razón y Palabra, 28*(119), 55–64. https://doi.org/10.26807/rp.v28i119.2100

Benavides, N., & Zambrano-Ramírez, J. (2023). Comprensión lectora autorregulada apoyada en tecnología en estudiantes de educación básica. *Revista Electrónica Educare, 27*(3), 1–19. https://doi.org/10.15359/ree.27-3.17221

Bråten, I., Haverkamp, Y. E., & Anmarkrud, Ø. (2025). Gaining a deeper understanding of the deep cloze reading comprehension test: Examining potential contributors and consequences. *Reading and Writing, 38*(2), 425–446. https://doi.org/10.1007/s11145-024-10521-y

Díaz, B., Nussbaum, M., Greiff, S., & Santana, M. (2024). The role of technology in reading literacy: Is Sweden going back or moving forward by returning to paper-based reading? *Computers & Education, 213*, 105014. https://doi.org/10.1016/j.compedu.2024.105014

Göle, M. O., & Temel, Z. F. (2024). The effect of digital game-based and different education programs on phonological awareness skills of 60–72 months-old children. *Kuramsal Eğitimbilim Dergisi [Journal of Theoretical Educational Science], 17*(1), 202–235. http://doi.org/10.30831/akukeg.1358837

Graça, V., Quadro, P., & Ramos, A. (2022). The integration of the digital platform Educaplay in interdisciplinary paths in the 1st and 2nd basic education cycles. *Athens Journal of Education, 9*(3), 377–391. https://doi.org/10.30958/aje.9-3-2

Herrera Viana, M. C., & Gallego Betancur, T. M. (2023). Comprensión lectora de textos continuos y discontinuos mediante estrategias metacognitivas. *Enunciación, 28*(1), 69–82. https://doi.org/10.14483/22486798.20504

Honorato-Errázuriz, J., Bastidas-Schade, V., & Ramírez-Montoya, M. (2024). Measuring a national reading program: Questionnaires design, validation, and pilot testing. *Journal of Social Studies Education Research, 15*(2), 273–304. https://knowledgesociety.usal.es/http//www.doi.10.5281/zenodo.14322668

Konca, A. S., & Hakyemez-Paul, S. (2021). Digital technology use of kindergarten teachers for parental involvement: Involvement in the Turkish context. *Psycho-Educational Research Reviews, 10*(3), 239–254. https://doi.org/10.52963/PERR_Biruni_V10.N3.15

Kumar, R., & Dhar, D. (2024). A think-aloud study: Exploring the effects of digital vs. print comics on reading efficiency and comprehension. *Education and Information Technologies, 29*(10), 12143–12166. https://doi.org/10.1007/s10639-023-12281-8

Liu, D. (2024). The effects of segmentation on cognitive load, vocabulary learning and retention, and reading comprehension in a multimedia learning environment. *BMC Psychology, 12*(1), 4. https://doi.org/10.1186/s40359-023-01489-5

Long, K. A., & Bowles, T. N. (2024). No-fee school consistently outperforms Progress in International Reading and Literacy benchmarks: Presenting early grade reading data from a case in Makhanda, Eastern Cape. *South African Journal of Childhood Education, 14*(1), a1376. https://doi.org/10.4102/sajce.v14i1.1376

Lo-Philip, S. W. Y. (2024). Digital close reading for lower primary students. *The Reading Teacher, 77*(6), 850–860. https://doi.org/10.1002/trtr.2304

Martínez, M., Borda, J., Montes, M., & Falla, J. (2023). ICT in the development of phonological awareness: A critical literature review. *Digital Education Review, (44)*, 125–132. https://doi.org/10.1344/der.2023.44.125-132

Molina-Jiménez, A. A., Hernández-Pérez, J. A., & Rivera-Tecorral, F. (2023). Estrategias didácticas que favorecen la comprensión lectora en 3er grado de nivel primaria. *Revista RedCA, 6*(16), 1–21. https://www.redalyc.org/journal/7487/748780785001/html/

Özok, H. İbrahim, & Çelik, R. N. (2022). The effect of web-supported accurate and speed reading development program on the readıng skills of primary school students. *Pegem Journal of Education and Instruction*, *12*(3), 197–207. https://doi.org/10.47750/pegegog.12.03.21

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., et al. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ, 372*, n160. https://doi.org/10.1136/bmj.n160

Pereyra, M. F., Vernucci, S., Andrés, M. L., Valle, M. V., Olsen, C., García-Coni, A., & Canet-Juric, L. (2024). Contribución de la tolerancia al distrés y la memoria de trabajo a la comprensión lectora en niños de 9 a

12 años de edad. *Acta Colombiana de Psicología, 27*(1), 195–209. https://doi.org/10.14718/ACP.2024.27.1.11

Rad, H. S. (2025). Reinforcing L2 reading comprehension through artificial intelligence intervention: Refining engagement to foster self-regulated learning. *Smart Learning Environments, 12*(1), 23. https://doi.org/10.1186/s40561-025-00377-2

Samosa, R., Policarpio, M., Cañamaque, B., Camocamo, P., & Clavito, J. (2022). Gamification as an innovative strategy to improve learners' writing skills. *International Journal of Advanced Multidisciplinary Research, 5*(12), 25–32. https://doi.org/10.17613/xy09-1991

Seifert, S., & Paleczek, L. (2021). Digitally assessing text comprehension in grades 3-4: Test development and validation. *The Electronic Journal of e-Learning, 19*(5), 336–348. https://doi.org/10.34190/ejel.19.5.2467

Solís-Martínez, E., & Ramas-Arauz, F. E. (2024). Fortalecimiento de la comprensión lectora mediante organizadores gráficos (mapa conceptual y mapa de lectura). *Revista RedCA, 7*(19), 83–108. https://doi.org/10.36677/redca.v7i19.22146

Song, S. (2022). Digital service-learning: Creating translanguaging spaces for emergent bilinguals' literacy learning and culturally responsive family engagement in mainstream preservice teacher education. *TESL-EJ, 26*(3). https://doi.org/10.55593/ej.26103a5

Sulieman, H. A. A., Alamoush, I. M. A., & Al Shdaifat, K. A. A. (2024). The impact of a cognitive neuroscience-based educational program on developing reading comprehension skills among intermediate stage students. *International Journal of Education in Mathematics, Science, and Technology (IJEMST), 12*(3), 575–589. https://doi.org/10.46328/ijemst.4051

Wang, X., Zhong, Y., Huang, C., & Huang, X. (2024). ChatPRCS: A personalized support system for English reading comprehension based on ChatGPT. *IEEE Transactions on Learning Technologies, 17*, 1762–1776. https://doi.org/10.1109/TLT.2024.3405747

Zaidi, R., Metcalfe, R., & Norton, B. (2022). Dual language books go digital: Storybooks Canada in French immersion schools and homes. *Canadian Journal of Applied Linguistics, 25*(1), 64–87. https://doi.org/10.37213/cjal.2022.31626

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CONFLICT OF INTEREST DECLARATION

The authors state that there are no financial or personal conflicts of interest that may have improperly influenced the preparation, analysis, interpretation, or presentation of the results of this study.

DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE

The authors declare that, during the writing process of this manuscript, generative artificial intelligence tools were used solely as support for linguistic tasks, such as style enhancement, syntactic organization, and grammatical correction. Under no circumstances were these technologies used to generate original scientific content, interpret results, or replace the academic and ethical judgment of the authors. Full responsibility for the integrity, validity, and originality of the manuscript rests solely with the authors, in accordance with recognized editorial best practices and internationally acknowledged ethical principles of scientific publication.