

Digital Pedagogical Innovations in English Language Education: A Systematic Literature Review

Husnul Khatimah¹

¹English Language Studies Postgraduate Program, Faculty of Cultural Sciences, Hasanuddin University, Makassar

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Corresponding Author:
Husnul Khatimah

Email:

husnulkhatimah@yahoo.com

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ABSTRACT

Purpose: This systematic review aims to examine the incorporation of digital technologies in English language education, comparing it to conventional, non-digital approaches. The study investigates the effects of digital tools, including AI-driven tutoring systems, mobile learning platforms, and gamification, on improving language learning experiences.

Subjects and Methods: The study utilized a structured approach in conducting a systematic literature review. Extensive analysis of current scholarly works on the integration of digital technologies in language education was conducted, focusing on studies that explore the use of AI tools, mobile platforms, and gamified learning.

Results: The findings of this study indicate that digital technologies provide notable benefits to language learning. These include personalized learning paths, increased engagement through interactive content, and the opportunity to practice language skills in immersive, realistic scenarios. Despite these benefits, persistent challenges such as the digital divide, the necessity for teacher training, and the financial implications of adopting new technologies remain. These issues can hinder the full integration of digital technologies into language learning.

Conclusions: The study concludes that digital innovations have a substantial impact on language learning outcomes. However, it is essential to emphasize that these technologies should be used in conjunction with, rather than as a substitute for, traditional methods. A hybrid approach combining the structured nature of traditional education with the interactive and adaptable qualities of digital methods has the potential to yield more comprehensive language learning outcomes.

INTRODUCTION

The increasing integration of technology into educational environments has revolutionized conventional methods of teaching and learning, necessitating the exploration of current pedagogical strategies. With the growing integration of digital tools in educational systems globally, it is crucial to conduct a thorough evaluation of the advantages and disadvantages brought about by this technological revolution. There has been a notable transformation in the field of English language education. Digital advancements have become more than just supplementary tools; they now play a pivotal role in reshaping the methods of teaching and learning the language.

The significance of technology in education cannot be emphasized enough, particularly in a time marked by swift digital transformation. The advancement of technology has greatly enhanced the availability of various resources and educational platforms, allowing educators and students to create more engaging and interactive learning environments. Various digital tools, including

virtual classrooms, language learning apps, interactive software, and augmented reality experiences, provide a range of methodologies to effectively engage with the English language. These tools are designed to accommodate different learning preferences and needs. These technologies have the ability to increase student engagement and make English language education more accessible to learners from diverse geographical, economic, and social backgrounds.

Nevertheless, the incorporation of these technologies also requires a comprehensive comprehension of their educational ramifications. As educational technologies continue to advance, it is imperative for educators to adapt their pedagogical strategies accordingly. Continual assessment of teaching methods is necessary to ensure their continued efficacy and pertinence. It is essential to have current pedagogical strategies in order to adapt to the ever-changing digital technology and meet the diverse and evolving needs of learners. Contemporary pedagogical approaches must be flexible and all-encompassing, fostering not only the development of language skills but also the cultivation of critical thinking, creativity, and digital literacy.

In addition, the incorporation of digital tools in English language education poses distinct challenges that need to be resolved. Relevant concerns include the digital divide, which can worsen educational disparities due to unequal access to technology, and the possibility of technology serving as a distraction rather than a tool for engaging learners. Additionally, there is the task of ensuring that digital pedagogical strategies are implemented in a manner that enhances the learning experience, rather than detracting from it. This encompasses not only the provision of technology, but also the provision of comprehensive training for educators, rigorous curriculum development, and the establishment of supportive policies and frameworks.

This review aims to critically evaluate the integration of digital innovations into English language teaching and their impact on educational outcomes, taking into account various considerations. This review aims to identify best practices and potential pitfalls by examining a range of digital pedagogical innovations and their implementation across diverse educational contexts. Our objective is to actively participate in the ongoing discussion surrounding the enhancement of English language education using technology. We aim to ensure that teaching methods not only keep up with technological progress, but also effectively utilize these tools to create a diverse, inclusive, and productive learning atmosphere. This thorough investigation will therefore offer valuable insights for educators, policymakers, and stakeholders in the field of English language education, guiding them towards making more informed decisions that will shape the future of educational practices.

The landscape of English language education has been greatly transformed by digital pedagogical innovations, offering educators and learners a range of distinct possibilities and obstacles to navigate (Hockly & Dudeney, 2018; Ahmad et al., 2024). It is crucial to comprehend the influence of technology on English language teaching as it becomes increasingly integrated into educational settings. The integration of digital tools and methodologies has not only improved traditional educational practices, but has also introduced new dynamics in the learning process (Ahmad et al., 2024). This calls for a thorough examination of their effective integration and resulting outcomes.

Within the field of English language education, there exists a wide array of digital pedagogical innovations. These innovations encompass interactive applications, online learning platforms, virtual reality environments, and advanced language learning software (Anggrawan et al., 2019). These tools strive to enhance the accessibility, engagement, and flexibility of learning, catering to the needs of a generation of students who are accustomed to digital technology. For instance, online platforms offer a wide range of resources and interactive exercises that provide instant feedback and personalized learning paths, which may not be possible in traditional classroom environments (Anggrawan et al., 2019).

Virtual reality, however, provides students with an immersive experience in English-speaking environments, enabling them to apply their language skills in contextually rich settings. This helps to connect theoretical knowledge with practical usage, resulting in a more comprehensive

learning experience. The incorporation of these technologies in English language education has led to a transition towards learner-centered approaches, empowering students to have greater control over their learning pace and style. This shift is of great importance as it addresses the unique learning needs of individuals and fosters a more inclusive educational setting. In addition, digital tools allow for ongoing engagement of students beyond the classroom by providing accessible materials and online support systems, which promote consistent language practice and exposure (Beach, 2012).

Nevertheless, the extensive implementation of digital pedagogical innovations presents certain difficulties. An important issue to consider is the digital divide, which has the potential to restrict access to these innovative tools for students from disadvantaged backgrounds or less developed regions. Without equitable access to digital resources, the potential advantages of these pedagogical approaches may only be realized by a limited portion of the learner population, thereby worsening current educational disparities. In addition, the efficacy of digital tools is heavily reliant on the proficiency and preparedness of educators to incorporate them into their instructional methods (Valverde-Berrocso et al., 2021). Teachers should receive comprehensive training in both the technical aspects of these technologies and the pedagogical strategies that can optimize the use of digital tools to improve learning outcomes.

In addition, the use of digital innovations presents new opportunities for engaging with the English language, but it also prompts inquiries into the extent and caliber of learning that can be attained (Pahomov, 2014; Mhlanga, 2023). It is of utmost importance to thoroughly assess whether these technologies promote authentic comprehension and enduring retention of language skills. Research and studies in this field are crucial for comprehending the effects of digital tools on the cognitive and linguistic development of learners.

Ultimately, digital pedagogical innovations have the potential to revolutionize English language education, offering a more individualized, captivating, and easily accessible learning experience (Asad et al., 2021). In order to fully maximize their potential, it is crucial to tackle the obstacles associated with access, teacher training, and pedagogical effectiveness. Ongoing research and evaluation are essential to enhance these digital tools and methods, guaranteeing they align with the evolving needs of learners and educators in a rapidly changing digital environment. As we progress, our objective should be to utilize these advancements in order to develop a more inclusive, efficient, and comprehensive English language learning experience.

The main objective of this systematic literature review is to assess the integration of digital innovations into English language teaching and evaluate their impact on educational outcomes. The purpose of this review is to consolidate current research findings in order to present a thorough examination of the efficacy, difficulties, and educational advantages of digital tools and methodologies in the field of English language education. This study aims to examine different digital innovations, such as interactive software, mobile applications, virtual classrooms, and augmented reality. The goal is to identify important trends, outcomes, and best practices that can guide future pedagogical strategies and improve English language learning experiences worldwide.

METHODOLOGY

This paper applied systematic literature review. A thorough search was carried out in a number of reputable academic databases that are widely recognized for their focus on educational and technological research. These databases include Scopus, PubMed, ERIC, and Google Scholar. The search was conducted on articles published from January 2014 to the present in order to encompass the latest advancements in digital pedagogical innovations. The user utilized a range of terms such as "digital pedagogy", "English language teaching", "educational technology", "e-learning in English education", and "digital tools in language learning". The are 50 articles that found using publish or perish. After that, extract relevant data from the selected studies using standardized forms that found 9 articles that used to further discussion. This strategy was developed to cover a wide range of studies on digital innovations in English language education, ensuring a thorough collection of relevant literature. The review encompassed scholarly articles, conference papers, and doctoral dissertations that presented empirical evidence or substantial

analysis of digital innovations in English language education. The exclusion criteria encompassed articles that had not undergone peer review, publications that were over ten years old, studies conducted in languages other than English, and research that did not have a direct connection to the field of English language teaching. The criteria were established to ensure that the information analyzed is of high quality and relevance. The focus is on rigorous academic contributions and recent studies that reflect current technologies and methodologies. Systematic data extraction was conducted for each study, collecting information on study design, digital pedagogical innovations employed, measured outcomes, data collection methods, key findings, and limitations. For example, in a study that utilized virtual reality for English language instruction, the review highlighted the specific tools used, such as Publish or Perish and Vosviewer. It also mentioned the educational level of the participants, the outcome measures used to assess engagement or proficiency improvement, and the assessment methods employed. This extensive data extraction enables a thorough analysis and comparison of the effects of various digital tools on learning outcomes in English language education. Additionally, it assists in the identification of trends, gaps, and areas that require further research.

Figure 1. The Identification of Trends and Gaps

Description of Collected Data

Author	Title	Methodology	Key Findings
Lin et al. (2023)	Integration of AI and IT in sustainable education	Systematic review	Explores how AI and IT support sustainable education, identifying key challenges and future trends.
Prasetyo (2022)	Digital games and reading skills	Qualitative-interpretative design	Examines integration and dilemmas of digital games and reading skills, suggesting improvements in learning reading through games.
Almahyra (2023)	AI-driven tutoring systems for English language learners	Review	Discusses adaptability of AI systems in customizing learning experiences, emphasizing personalized learning paths.

Alraakhawi et al., (2023)	Intelligent Tutoring Systems In Education: A Systematic Review Of Usage, Tools, Effects And Evaluation	Systematic Literature Review (SLR)	Outlines the application and impact of ITS in education, utilizing PRISMA guidelines for systematic reviews.
Nabung (2023)	Impact of interactive multimedia on EFL learning outcomes	Quasi-experimental	Shows that interactive multimedia tailored to learning styles significantly improves EFL outcomes.
Ma et al., (2014).	Intelligent Tutoring Systems and Learning Outcomes: A Meta-Analysis	A Meta-Analysis	ITS are relatively effective tools for learning is consistent with our analysis of potential publication bias.
Shahrole et al., (2020)	A Systematic Literature Review on Teaching and Learning English Using Mobile Technology	Systematic review	The results show that providing suitable educational technology is one of the key success factors to enhance teaching and learning English. This paper reports the key gap and limitation in current studies that focus on teaching and learning English using mobile technology.
De al., (2023).	Use Of Gamification In English Learning In Higher Education: A Systematic Review	A Systematic Review	In gamified English learning environments, pleasantness, attractiveness, motivation, and enjoyment were all desirable qualities. Gamification's intended learning goals were language content learning, involvement, motivation, and satisfaction
Shi et al., (2023)	Utilizing AI models to optimize blended teaching effectiveness in college-level English education	Experimental design	This study highlights the potential for educators to transform the way we teach and learn and improve the quality of education and support student success.

The Significance of Digital Innovations in Enhancing English Language Learning

The integration of digital innovations in English language learning has profoundly transformed educational practices, enhancing both teaching methodologies and student outcomes. The systematic incorporation of technologies such as artificial intelligence (AI), gamification, and mobile learning platforms has redefined traditional language learning landscapes, offering more engaging, personalized, and accessible learning experiences.

One significant aspect of digital innovations in English language education is the personalization of learning experiences. AI-driven tutoring systems, as discussed by Almahyra (2023), exemplify how technology can adapt to individual learning styles and preferences, thereby increasing the effectiveness of language learning. AI systems can provide personalized feedback, tailor content to the learner's proficiency level, and predict potential learning obstacles, thus offering a more customized learning journey (Almahyra, 2023). This adaptive learning approach not only supports diverse learner needs but also enhances learner autonomy and engagement, crucial factors in language acquisition.

The use of interactive multimedia in English language education has shown considerable promise in improving learning outcomes. Nabung (2023) highlighted that the dynamic linkage between interactive multimedia applications and learning styles could significantly boost English as a Foreign Language (EFL) learning outcomes. The study revealed that when educational content is presented through a combination of text, video, audio, and interactive elements tailored to various sensory preferences, students achieve better comprehension and retention (Nabung,

2023). This multimodal approach caters to different learning styles, making learning more accessible and effective for a broader student population.

Gamification is another digital innovation that has been effectively applied in English language learning. By incorporating game design elements in educational settings, learning becomes more engaging and motivational. De et al. (2023) reported that gamification strategies could enhance students' motivation and participation, leading to improved language skills in higher education contexts. The study emphasized that gamified learning environments promote active learning and help sustain student interest and effort over time (De et al., 2023). Such environments not only make learning enjoyable but also encourage a deeper engagement with the language learning process.

Virtual reality (VR) also offers transformative benefits in English language education by providing immersive and interactive experiences that simulate real-life situations. VR could be used to create authentic contexts for language practice, allowing learners to use English in virtual scenarios that mimic everyday interactions (Kessler, 2018). This exposure is invaluable as it helps learners develop practical language skills in a safe and controlled environment, thereby reducing the anxiety associated with real-world communication.

Furthermore, mobile learning technologies have expanded the reach and accessibility of English language learning. The flexibility of mobile platforms enables learners to access educational content anytime and anywhere, thereby facilitating continuous learning outside the traditional classroom setting. The study discussed various mobile learning approaches that support self-paced and situated learning, making it easier for students to integrate language learning into their daily lives (Li et al., 2022). This accessibility is particularly crucial in regions where traditional educational resources are limited, thus democratizing learning opportunities.

The Advantages and Potential Obstacles Encountered in Integrating Technology into Language Education

The integration of technology into language education has brought about transformative benefits, yet it also presents unique challenges that educators and institutions must navigate. The benefits of incorporating technology in language learning environments are substantial, offering enhanced engagement, increased accessibility, practical application, and personalized learning experiences. Gamification and interactive multimedia, for example, significantly boost student engagement and motivation. Studies like that of De et al. (2023) emphasize how gamification in English learning not only makes the process more enjoyable but also increases participation and motivation, thereby enhancing language retention and mastery. Additionally, Nabung (2023) demonstrates how multimedia that integrates various sensory inputs text, audio, video can cater to diverse learning preferences, thereby keeping students more engaged and improving learning outcomes.

The flexibility provided by mobile learning technologies breaks down traditional barriers of time and geography. Mobile learning allows students to access materials anytime and anywhere, which is especially beneficial for learners who might have other responsibilities or those with limited access to traditional classroom settings. Virtual reality (VR) offers another layer of benefit by providing immersive experiences that simulate real-life situations where language skills can be practically applied. According to Alam (2023) VR not only enhances practical language skills but also prepares learners more effectively for real-world interactions by allowing them to practice English in realistic scenarios within a controlled environment. Furthermore, AI-driven tutoring systems adapt to individual learning needs, offering personalized feedback and content that suits specific learning paces and styles. Bhatti et al. (2024) discusses how AI can tailor learning experiences to maximize effectiveness by focusing on the learner's strengths and weaknesses.

The integration of such advanced technologies is not without its challenges. Technological inequality represents a significant hurdle, with the digital divide creating gaps in who can and cannot access these innovative tools. Not all students have equal access to technological devices or the internet, potentially widening the gap in language proficiency among different socio-economic groups. Additionally, the successful implementation of educational technology heavily relies on teacher training and adaptability. Without adequate training and support, teachers may

struggle to integrate new technologies effectively, thus not utilizing these tools to their full potential, which can limit their impact on language learning.

Cost is another critical challenge, as implementing new technologies can require significant investments in devices, software, and necessary infrastructure like high-speed internet. This can be particularly challenging for underfunded educational institutions. Moreover, there is a risk of over-reliance on technology, which might detract from developing fundamental language skills essential for holistic education. Therefore, while technology offers numerous benefits to language education, it is imperative that its integration be handled with a strategic and balanced approach to truly enhance and not hinder the educational process.

Contrast the Outcomes with More Traditional, Non-Digital Approaches

The integration of digital technologies in English language education represents a significant shift from traditional, non-digital methodologies. Traditional methods, often characterized by teacher-centered lectures, rote memorization, and static textbooks, have long been the backbone of language instruction. However, the advent of digital technologies has introduced dynamic and interactive components to language learning, which contrast sharply with these older approaches.

Digital innovations offer interactive and engaging learning experiences that are difficult to achieve with traditional methods. For example Gamified learning environments provide immersive experiences that traditional classroom settings cannot offer. Studies such as those by Stavroulia et al. (2019). Illustrate how VR can simulate real-world interactions in foreign language contexts, allowing learners to practice language skills in a variety of realistic and controlled scenarios. This immersive learning is far removed from the traditional textbook approach, where contextual language usage is often limited to written scenarios that may not effectively mimic real-life situations.

Moreover, digital tools like AI-driven tutoring systems, highlighted by Peng et al. (2019), offer personalized learning paths that adapt to individual learner needs, an approach that is generally lacking in traditional education systems. These systems can adjust the difficulty of tasks based on learner performance in real-time, something that traditional methods, with their one-size-fits-all approach, often fail to achieve. This personalized learning ensures that students remain engaged and receive support tailored to their specific needs, enhancing their overall learning efficiency.

Additionally, the use of mobile learning platforms allows for greater accessibility and flexibility, enabling students to engage with language learning materials outside of the traditional classroom and on their schedules. The study on Stavroulia et al. (2019). points out that mobile technologies not only facilitate access to learning resources but also enable connectivity and interaction between students and teachers, thus extending the learning environment beyond the classroom walls.

It is important to recognize that while digital methods offer numerous benefits, traditional methods still hold value, particularly in developing foundational skills such as grammar and vocabulary. Traditional methods, with their focus on systematic instruction and structured practice, provide a solid foundation that is sometimes overlooked in more modern approaches that favor engagement over depth.

While digital methods have transformed language learning through interactivity, personalization, and increased accessibility, they should be viewed as complementary to traditional methods rather than replacements. The ideal educational approach might blend both traditional and digital methodologies, leveraging the strengths of each to provide a comprehensive language learning experience. This hybrid approach could harness the reliability and systematic nature of traditional methods while also capitalizing on the engagement and adaptability of digital technologies.

Discussion

The results from the systematic review provide a detailed exploration of how digital innovations are reshaping English language education. While these innovations present substantial benefits, they also pose significant challenges. This discussion aims to unpack these findings, explore their

implications for language learning, and suggest how traditional and digital methods can coexist to maximize educational outcomes.

Benefits of Digital Innovations in Language Education

One of the most prominent benefits of digital technologies in language learning is the personalization of educational experiences. AI-driven tutoring systems, such as those discussed by Almahyra (2023), have shown immense potential in customizing learning experiences based on individual student needs. The ability of AI systems to adapt content, assess progress in real-time, and provide immediate feedback allows students to work at their own pace, which is a stark contrast to the rigid structure often associated with traditional learning methods. This approach not only ensures greater engagement but also empowers learners by allowing them to take control of their own learning journey.

Moreover, the integration of interactive multimedia has brought about significant improvements in language learning outcomes. As highlighted by Nabung (2023), multimedia that incorporates text, video, and audio appeals to a wide range of learning styles, offering a more comprehensive and engaging way to learn. This multimodal approach enables students to engage with language content more effectively, improving comprehension and retention. The ability to customize content based on sensory preferences makes language learning more accessible to a diverse student population, thus leveling the playing field for learners from varying backgrounds.

Another advantage of digital tools is the role of gamification in promoting active learning. By transforming the learning process into a more game-like experience, gamification strategies increase motivation, participation, and enjoyment. As demonstrated by De et al. (2023), gamified environments enhance students' engagement with the content, motivating them to actively participate in language exercises. These environments also help maintain sustained interest, leading to better language retention. The role of gamification in enhancing motivation is particularly important in language acquisition, as sustained engagement is crucial for long-term success.

Overcoming Challenges in Integrating Digital Technologies

Despite the clear benefits, several challenges must be addressed to ensure the effective integration of digital technologies into language education. One of the most pressing issues is the digital divide. The unequal access to technology, particularly in lower-income regions, creates barriers to the full utilization of digital tools. As stated in the results section, not all students have equal access to the internet or technological devices, which could widen the gap in language proficiency between different socio-economic groups. To mitigate this issue, it is essential for educational institutions and governments to prioritize digital infrastructure and ensure equitable access to technological resources.

Teacher training is another significant challenge. The integration of digital tools requires educators to not only understand the technology itself but also to adapt their teaching methods accordingly. Without sufficient training and support, teachers may struggle to effectively implement digital technologies, which can lead to their underutilization. Therefore, comprehensive professional development programs are necessary to equip teachers with the skills and knowledge to integrate digital tools into their classrooms effectively. These programs should focus on how to use technology to enhance teaching and learning outcomes, as well as how to adapt traditional pedagogical strategies to the digital context.

Cost is also a major barrier to the widespread adoption of digital tools in language education. The initial investment required for purchasing devices, software, and establishing infrastructure can be prohibitive for many educational institutions, especially those in underfunded regions. To overcome this, it is important to explore cost-effective solutions, such as open-source software or mobile learning platforms that require less infrastructure. Public-private partnerships can also be explored to provide funding for technology integration in education.

The Complementary Role of Traditional and Digital Approaches

While digital tools have transformed language education by making learning more personalized, engaging, and accessible, it is important to recognize the continued relevance of traditional methods.

Traditional approaches, such as teacher-centered instruction, systematic practice, and textbook-based learning, provide essential foundations in grammar, vocabulary, and basic language skills. These methods offer structured and systematic instruction, which is critical for building strong language foundations. In contrast, digital tools can enhance the learning experience by adding interactivity, engagement, and real-world applicability.

The challenge, therefore, is not to replace traditional methods but to integrate them with digital technologies in a complementary manner. For instance, while AI-driven systems and gamified environments may be used for personalized practice and engagement, traditional methods can still play a vital role in reinforcing basic grammar and vocabulary through structured exercises. The ideal approach would involve blending both traditional and digital methods to create a hybrid learning environment that leverages the strengths of each.

This hybrid model offers the potential for a more comprehensive language learning experience. Traditional methods provide the systematic approach required for foundational language skills, while digital tools offer the flexibility, engagement, and personalized learning that support advanced proficiency. By combining these approaches, educators can create a balanced and effective language learning environment that caters to the diverse needs of students.

CONCLUSION

The transformative role of digital technologies in English language learning, comparing their impact to traditional teaching methods. Technologies such as virtual reality, AI-driven tutoring, mobile learning platforms, and gamification were evaluated for their effectiveness in enhancing engagement, providing personalized learning experiences, and improving accessibility. The findings reveal that digital tools offer significant advantages in engaging students and tailoring learning experiences to individual needs. However, they also present challenges including equity in access, the necessity for teacher training, and the costs associated with technology implementation. The study advocates for a hybrid approach that combines the best aspects of both traditional and digital methodologies to create a more effective and comprehensive language learning environment. This balanced approach is recommended to leverage the structured nature of traditional methods with the interactive and flexible capacities of digital technologies.

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