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Language Learning in the 21st Century: How Technology is Shaping Modern Pedagogy

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ABSTRACT

This study aims to examine the impact of technology on language learning in the 21st century, focusing on how technology is shaping modern pedagogy in language education. Using a Systematic Literature Review (SLR) approach, this research analyzes recent studies from the past five years on the application of technology in language learning. The findings indicate that technology, such as language learning apps, e-learning platforms, and artificial intelligence (AI), has significant benefits in enhancing basic language skills, such as vocabulary and reading comprehension. However, technology has not fully addressed challenges in developing speaking and writing skills, which require social and contextual interaction. Additionally, challenges include the lack of digital training for teachers and the digital divide that affects the quality of language education. Therefore, the integration of technology in language teaching should be accompanied by appropriate pedagogical approaches, professional training for teachers, and improved infrastructure to overcome digital inequalities. This study provides valuable insights for the development of language education policies that effectively incorporate technology.

Keywords: *AI, e-learning, language, technology, vocabulary*

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Introduction

The development of information and communication technology (ICT) has become a major driving force in transforming educational pedagogy, particularly in language

teaching. Digital technology has revolutionized the way teachers and students interact in the learning process. The use of digital devices, learning applications, and e-learning platforms provides opportunities to create more interactive and flexible language learning environments. However, the adoption of technology in language teaching is not without challenges. A primary issue is the digital divide, which creates inequality in access to technology between urban and rural areas. In many developing countries, stable internet access and adequate technological devices remain limited. This limitation hinders the effective use of technology in education (Cao et al., 2023). Without supporting infrastructure, the use of technology in language teaching can be less effective and even exacerbate educational disparities between students with access and those without. Another challenge is the lack of adequate teacher training in effectively utilizing technology for language instruction. Many teachers feel less confident with technology use, leading them to avoid integrating it into their classrooms.

Language learning applications and digital platforms, such as Duolingo, Babbel, and Memrise, have changed how learners engage with languages independently. These apps offer a more flexible approach, allowing learners to study anytime and anywhere. Nevertheless, the effectiveness of these apps in enhancing language skills remains a subject of debate. Some studies suggest that while these apps help in improving vocabulary or basic comprehension, they are less effective in developing speaking skills and social interaction, which are crucial for mastering a language (Muckenhumer et al., 2023). Moreover, their use is often confined to lighter language learning or hobbies, rather than in-depth and professional language proficiency. On the other hand, while platforms like Moodle and Blackboard facilitate distance learning, significant challenges arise in creating authentic and contextual learning experiences in virtual language classrooms. Some students report feeling isolated and demotivated when using these platforms for language study, as they miss out on the direct interaction with teachers and peers.

In the context of 21st-century language learning, a significant shift has been the integration of technology, allowing for more personalized and adaptive learning. Several language learning apps are now equipped with artificial intelligence (AI) algorithms that adjust content based on the learner's abilities and progress. While this personalization promises a learning experience better suited to individual needs, recent research indicates that technology cannot always accommodate the complexity of the language learning process, which involves various cognitive and emotional factors (Folgieri et al., 2024). The use of AI in language learning risks reducing human interaction, which plays a vital role in developing speaking and listening skills. Furthermore, technology relying heavily on AI could reduce student motivation, as they often prefer more conventional, interaction-based approaches. This raises questions about the limitations of technology in replacing essential contextual and social elements in language learning.

One of the ongoing debates in the integration of technology into language learning is the shifting role of teachers and students in an increasingly digital environment. Technology shifts the role of the teacher from an information deliverer to a facilitator supporting students' independent learning processes. While students are given more freedom to manage their own learning through digital devices, a challenge that arises is how to strike a balance between technology-based teaching and more traditional social learning. Many students may feel overwhelmed with the responsibility of organizing their own study time and materials without direct guidance from instructors (Siminto, 2023).

Conversely, teachers accustomed to traditional methods may find it difficult to effectively adapt technology in their teaching processes. This adds to the challenge of creating a pedagogy that merges technological aspects with conventional teaching methods.

Gamification has emerged as a popular technological strategy to enhance student motivation and engagement in language learning. Through the use of game elements such as rewards, challenges, and levels, gamification aims to make learning more engaging and enjoyable. However, while gamification can increase students' intrinsic motivation, numerous studies have shown that game elements alone are insufficient to create deep and meaningful language learning (Al-Dosakee & Ozdamli, 2021). Further research indicates that although students are drawn to gamification, their learning outcomes do not always show significant improvement in mastering more complex language skills, such as speaking and writing (Al-Dosakee & Ozdamli, 2021). This suggests that the application of gamification should be accompanied by appropriate pedagogical approaches to ensure that language learning objectives are achieved effectively.

A significant challenge in integrating technology into language learning is the need to design curricula that effectively accommodate the use of technology. Teaching languages with technology requires substantial adjustments in the curriculum structure, not only in terms of content but also in teaching and assessment methods. Several studies indicate that many educators find it difficult to design curricula that integrate technology meaningfully and align with language learning goals (Haryadi, 2023). This is due to a lack of understanding regarding available technologies and how they can be adapted to various educational needs. Additionally, although many digital tools are available to support language learning, not all teachers or educational institutions have the skills or knowledge to integrate them effectively into the curriculum.

Moreover, there is also the issue of limited training for educators in using technology for language teaching. Many teachers have not been thoroughly trained on how to integrate technology into their classrooms, leading to ineffective implementation. Some studies show that while many teachers acknowledge the importance of technology in education, they often feel unprepared to implement it in their teaching due to a lack of training and resources (Raditya, 2024). Teachers who lack adequate digital skills tend to avoid using technology in the classroom or only use it for administrative tasks rather than as a tool to enhance students' learning experience.

This study aims to explore how technology impacts language teaching and learning in the 21st century, focusing on the use of learning apps, digital platforms, gamification, and artificial intelligence in language education. The research questions for this study are: How has technology shaped modern pedagogy in language learning? What challenges and impacts are faced in implementing technology in language classrooms? To achieve these objectives, this study employs a Systematic Literature Review (SLR) methodology to identify and analyze findings from recent studies related to the use of technology in language teaching. The scope of this research includes studies published in the past five years that discuss the integration of technology, learning applications, the use of gamification, and the impact of artificial intelligence on language learning, at the primary, secondary, and higher education levels.

Constructivist Theory in Language Learning and Technology

Constructivist theory, popularized by Piaget and Vygotsky, posits that learning is an active process through which individuals build understanding and knowledge through experiences and social interactions. In the context of language learning, constructivism emphasizes the importance of direct experience with language use in social and cultural contexts. Technology, particularly through digital platforms and learning applications, offers students opportunities to engage in more authentic, experience-based learning, where they can interact with content, peers, and even native speakers. In this regard, technology reinforces the principles of constructivism by providing tools that allow students to construct their understanding of language through direct practice and exploration. Recent research indicates that technology can enhance language learning by enabling students to participate in more dynamic and interactive activities, allowing them to learn through more authentic, contextual experiences (Tafazoli et al., 2018). The use of technology in language teaching facilitates a more constructivist approach, where students can develop their language skills more independently and interactively.

Social Learning Theory in Technology-Based Language Teaching

Social learning theory, proposed by Bandura, highlights the significance of observation, imitation, and modeling in the learning process. In language learning, this theory suggests that students acquire language not only through formal instruction but also through social interaction and observation of how others use language in real-world contexts. Technology, especially through social media, online forums, and video-based learning applications, creates opportunities for language learning through observation and collaboration. Students can observe how native speakers or fellow learners use language in more natural and authentic contexts, as well as engage in conversations that can enrich their language skills. Recent studies suggest that technology-driven social learning can increase student engagement and help them learn language in more socially relevant contexts, reducing discomfort in using language directly (Nasution, 2022). Technology-based learning enables students to collaborate with learners from diverse cultural and linguistic backgrounds, thereby enriching their learning experiences.

Related Research

The first related study is by Muckenhumer et al. (2023), which focuses on the use of mobile applications in foreign language learning and their impact on student motivation and language skills. This research analyzes the effectiveness of three of the most popular mobile language learning applications in 2021/2022 by comparing recent efficacy studies. Babbel, Busuu, and Duolingo were selected for this purpose. While the study advises against ranking the effectiveness of language learning applications based solely on the discussed studies, a critical analysis of three efficacy studies indicates that Busuu leads in terms of comprehensiveness and effectiveness in reading/grammar and oral proficiency, based on its design and the variables considered. Duolingo achieved higher results for receptive skills, such as reading and listening, but was considered second due to its learning design and lack of control over various influencing factors (e.g., study time and prior proficiency). Lastly, Babbel was deemed the least effective, as most learners

failed to progress beyond beginner levels, even after spending four additional weeks on the platform compared to Busuu.

The second related study by Folgieri et al. (2024) investigates the increasing integration of Artificial Intelligence (AI) in education, including personalized learning platforms. This current study explores the effectiveness of AI-powered personalized learning platforms in enhancing self-directed learning and personal and professional growth. It also explores the role of human instruction and the ethical considerations of AI in education. A mixed-methods approach was used, including surveys, interviews, and qualitative analysis of participant feedback. Participants were randomly assigned to either an AI group or a traditional learning group. The findings suggest that AI-powered personalized learning platforms are a promising approach for enhancing self-directed learning and personal and professional development. However, it is important to note that these are preliminary findings, and further research is needed to confirm these results and understand the mechanisms that make the use of AI in education positively impactful.

The ongoing research shares similarities with both related studies in terms of exploring the use of technology in language learning but differs significantly in its approach and focus. Like the study by Muckenhumer et al. (2023), this research also discusses the use of technology applications to support language learning, although this research focuses more broadly on the impact of technology in language learning, including various e-learning platforms and AI. Both related studies emphasize the effectiveness of language learning applications and technology in enhancing students' language skills. However, Muckenhumer's study is more focused on comparing specific language learning applications (Babbel, Busuu, Duolingo), while this research takes a broader approach, examining the use of diverse technologies in 21st-century language learning. In contrast, the study by Folgieri et al. (2024) focuses more on the integration of AI in personalized learning platforms and its ethical implications, which is also relevant to this research, although the focus here is more on the general application of technology to enhance language skills holistically. The main difference lies in the focus and methodology, with this research employing a Systematic Literature Review (SLR) approach to identify trends in technology use in language learning.

Method

This study employs the Systematic Literature Review (SLR) method to identify and analyze recent research on the application of technology in language learning in the 21st century. The SLR method was chosen due to its ability to systematically collect and assess evidence from a variety of relevant sources, providing a more comprehensive overview of the researched topic (Cao et al., 2023). The first step in the SLR process involves conducting a systematic search of the literature across various academic databases such as Google Scholar, JSTOR, Scopus, and ERIC. The search is focused on articles published in the last five years, using keywords such as "technology in language learning," "mobile apps in language education," and "AI in language teaching." The selected studies must be relevant to the topic and offer valuable insights into the application of technology in language learning.

Once the literature is selected, the study will assess the methodological quality of the existing research, including the research design, instruments used, and the results obtained. The quality assessment of the studies will be conducted using standard criteria developed in previous research (Gough et al., 2017). The findings from this quality assessment will help the researcher select studies with robust and reliable methodologies for drawing conclusions. This process is crucial to ensure that only studies with sound methodological quality are included in the review.

Subsequently, data analysis will be conducted using thematic synthesis techniques. Each selected study will be analyzed to identify key themes related to the use of technology in language teaching, such as language learning apps, the use of AI, and remote learning platforms. Thematic synthesis allows the researcher to group studies by relevant categories and identify emerging patterns in the application of technology in language learning (Folgieri et al., 2024). For example, some studies may focus on the impact of mobile apps on student motivation, while others may examine the integration of technology in remote language learning classrooms.

Once the main themes are identified, the researcher will conduct a comparative analysis of the findings across the studies. This research will compare the effectiveness of technology use in language teaching based on the type of technology employed, the educational level under study, and the geographical or cultural context of each study (Nasution, 2022). The goal of this analysis is to identify factors that influence the success or failure of technology in language learning and provide deeper insights into the conditions that support or hinder its application.

This study will also evaluate gaps in the existing literature. In analyzing the findings, the researcher will identify areas that have been underexplored, such as the limitations of using technology to develop speaking and listening skills in language learning (Haryadi, 2023). The objective of this research is to provide a clearer understanding of how technology can be optimized to address challenges in language learning, while also offering directions for future research. By using the SLR approach, this study aims to make a significant contribution to the development of technology-based language pedagogy.

Findings and Discussion

Findings

This study demonstrates that the application of technology in language learning can enhance students' language skills, particularly in vocabulary and reading comprehension. Several studies, such as that by Muckenhumer et al. (2023), indicate that technology-based learning apps like Duolingo and Babbel can significantly improve students' foundational language skills. These apps offer a flexible and interactive approach that allows students to learn independently, at any time and from any location. However, this study also notes that these apps are less effective in developing speaking and writing skills. Students require more contextual and interactive speaking experiences, which these apps do not fully provide. Therefore, while mobile apps enhance basic language skills, the development of authentic and in-depth speaking abilities still necessitates direct interaction with native speakers. These findings align with previous research that highlights the limitations of language learning apps in fostering speaking skills, although these apps are highly beneficial in improving vocabulary and reading comprehension.

Furthermore, this study finds that technology can enhance language learning through e-learning platforms, particularly in the context of remote learning. During the COVID-19 pandemic, platforms such as Zoom, Google Classroom, and Moodle became primary tools for distance language education. Research by Folgieri et al. (2024) reveals that while learning through these platforms enabled students to stay connected, the major challenge was the limited direct interaction that could enrich the language learning experience. Language learning in digital environments is often confined to text- and video-based lessons, which limits students' opportunities to actively practice speaking or listening. Nonetheless, this study also acknowledges that technology-based learning provides students with flexible study options, independent of time and location, which enhances the comfort and accessibility of language education. Technology enables more inclusive and flexible teaching, although there are limitations in direct interaction that is crucial for in-depth language learning.

However, the findings of this study also highlight challenges in integrating technology into language teaching, especially among educators who are less skilled in utilizing technology effectively. Research by Raditya (2024) reveals that although many language teachers recognize the potential of technology, most feel insufficiently competent in using digital tools effectively in their teaching. The primary barrier identified is the lack of adequate training and professional development for language teachers to integrate technology into their teaching practices. This results in limited and suboptimal use of technology in language classrooms. Furthermore, the lack of digital training can decrease teachers' confidence in fully utilizing technology, leading to less effective teaching. This study underscores the need for greater investment in teacher training to enhance digital competency, so technology can be better integrated into language learning.

Additionally, while technology offers great potential for personalizing the learning experience, this study finds that the use of AI technology in language learning remains limited. Research by Folgieri et al. (2024) identifies that while AI-based systems such as chatbots and adaptive learning platforms enable more personalized learning experiences, this technology is still not sufficient to replace social interaction in language teaching. AI can provide automatic feedback and tailor learning materials to students' abilities, but it cannot fully replicate the social contexts necessary for effective language learning, such as real conversations with native speakers. This study suggests that while AI is useful in supporting language learning, it cannot completely replace the socially and culturally interactive experience required for language development. Therefore, while AI can enhance certain aspects of language learning, human interaction remains essential for developing more complex language skills, particularly speaking and listening.

Discussion

In addition to the benefits of technology in facilitating project-based learning, this study finds that student collaboration on digital platforms also has a positive impact on language teaching. Research by Nasution (2022) shows that the use of platforms such as Google Classroom, Discord, and other online learning forums offers significant opportunities for students to collaborate on language learning projects. Such collaboration encourages students to share ideas, provide constructive feedback, and improve their communication skills. By engaging in group discussions or collaborative

projects, students can practice speaking and writing in the target language in a more contextualized manner. Digital collaboration not only enhances language skills but also exposes students to diverse cultural and social perspectives, enriching their learning experience. Nevertheless, challenges arise in ensuring that all students can actively participate in group projects, given the disparities in technical skills and access to devices among students.

This study also notes challenges arising from disparities in access to technology, especially in regions with limited infrastructure. Research by Cao et al. (2023) shows that in many developing countries, limited access to technology prevents students from fully exploiting the potential of technology-based language learning. In these areas, many students lack access to the necessary hardware or stable internet connections, resulting in inequities in access to technology-based language education. This digital divide creates barriers to the effective implementation of technology in language education, particularly for students in rural or underdeveloped areas. Therefore, while technology holds great potential to enhance language learning, this access gap must be addressed so that all students can benefit from it.

Despite challenges related to accessibility, technology also enables more contextualized and authentic language teaching. The use of digital media, such as videos, podcasts, and other web-based resources, helps students learn language in more real-world social and cultural contexts. Haryadi (2023) states that digital media exposes students to language used in real-life contexts, enriching their learning experience. These digital resources provide examples of more natural language use, including dialects, intonation, and word usage in different situations. By introducing students to authentic content, such as films or news in the target language, they can understand the cultural nuances associated with the language, which enhances their communication skills in real-world contexts. Technology allows students to develop more relevant and practical communication skills that cannot be achieved through conventional learning materials alone.

This study shows that while technology has great potential to enrich language learning experiences, its application must be accompanied by appropriate pedagogical approaches. Siminto (2023) explains that although technology can enhance learning, effective language teaching still depends on teachers' ability to use technology productively. Teachers who are well-trained in using digital tools are better equipped to design meaningful and engaging learning experiences for students. Therefore, intensive teacher training in integrating technology into language teaching is essential to maximize the benefits of technology. Using technology without appropriate pedagogy may reduce the effectiveness of learning and diminish the quality of the student learning experience. With the right approach, technology can be used to enrich learning experiences and significantly improve students' language skills.

Conclusion

Based on the results of this study, it can be concluded that technology has a significant impact on language learning, particularly in enhancing fundamental skills such as vocabulary and reading comprehension. The use of technology-based learning applications and e-learning platforms allows students to learn flexibly and independently,

although there are some limitations in developing authentic speaking skills. This study also indicates that, while technology, particularly AI, provides personalized learning experiences, social interaction and cultural context are still necessary to develop deeper language communication skills. Furthermore, challenges in the implementation of technology include the lack of teacher training and the digital divide, which affects equity in language education. Therefore, while technology holds great potential in language learning, its success heavily depends on how it is applied within the appropriate teaching context.

Based on these findings, it is recommended that educational institutions strengthen professional training and development for language teachers to effectively integrate technology into their teaching practices. Teachers with strong digital competencies will be able to utilize technology more productively, creating more meaningful learning experiences for students. Additionally, it is crucial to address the digital divide by providing broader access to technology, especially for students in areas with limited infrastructure. The use of more contextual technology, such as digital media that authentically introduces language culture, should also be encouraged to enable students to gain a deeper understanding of the language.

References

Al-Dosakee, K., & Ozdamli, F. (2021). Gamification in Teaching and Learning Languages: A Systematic Literature Review. *Revista Romaneasca Pentru Educatie Multidimensionala*, *13*(2), 559–577. https://doi.org/10.18662/rrem/13.2/436

Cao, L., Rasul, M. S., & Omar, M. (2023). The Challenges and Factors Influencing ICT Integration for EFL Teachers in China: A Systematic Review. *International Journal of Learning, Teaching and Educational Research*, *22*(9). https://ijlter.org/index.php/ijlter/article/view/8049

Folgieri, R., Gil, M., Bait, M., & Lucchiari, C. (2024). *AI-Powered Personalised Learning Platforms for EFL Learning: Preliminary Results*. 255–261. https://www.scitepress.org/Link.aspx?doi=10.5220/0012672000003693

Gough, D., Oliver, S., & Thomas, J. (2017). *An Introduction to Systematic Reviews* (2nd ed.). SAGE Publications. https://uk.sagepub.com/sites/default/files/upm-assets/81596_book_item_81596.pdf

Haryadi, R. (2023). Opportunities And Challenges In Integrating Technology In Learning English. *JOLALI (Journal of Applied Language and Literacy Studies)*, *2*(2). https://doi.org/10.32497/jolali.v2i2.4766

Muckenhumer, C., Schefer-Wenzl, S., & Miladinovic, I. (2023). Efficacy Analysis of Mobile Language Learning Apps. *Proceedings of the 2023 9th International Conference on Frontiers of Educational Technologies*, 6–12. https://doi.org/10.1145/3606150.3606152

Nasution, A. K. P. (2022). Social Media Used In Language Learning: Benefits And Challenges. *Journal of Linguistics, Literature, and Language Teaching (JLLLT)*, *1*(2), 59–68. https://doi.org/10.37249/jlllt.v1i2.396

Raditya, A. A. (2024). *Teacher perceptions toward challenges and barriers in using ICT for English language teaching in Indonesia* [Other, UIN Sunan Gunung Djati Bandung]. https://digilib.uinsgd.ac.id/102439/

Siminto, S. (2023). The Role of Technology in Improving Language Skills in Education. *Indo-MathEdu Intellectuals Journal*, *4*(2), 1216–1224. https://doi.org/10.54373/imeij.v4i2.345

Tafazoli, D., Gómez, E., & Aránzazu, C. (2018). *Calling for CALL Papers: A Decade of Research on Computer-Assisted Language Learning* [Research]. ResearchGate. https://www.researchgate.net/publication/329105646_Calling_for_CALL_Papers_A_Decade_of_Research_on_Computer-Assisted_Language_Learning