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Impact of Technology Integrated Language Learning: A Systematic Review

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ABSTRACT: Technology is an integral part of the process of learning in the ever-changing field of language education. Technology also provides special tools to help with language learning. Technology is constantly changing the educational scene and it is important to investigate the impact it has on language proficiency. Recently, a lot of studies have been done in this area and the results of those studies also point to the same. To alleviate the constraints, the articles often suggest ideas for the future study directions. This applies to review articles too. The present review article attempts to relate the flagged limits of technology-based learning with the recommendations and scope of future research as suggested by recent research papers. Relevant papers published between January 2022 and May 2026 were obtained and reviewed from the main academic databases. These findings offer useful insights for educators and researchers interested in developing successful technology-integrated language learning environments**.**

KEYWORDS: Technology-integrated language learning, language pedagogy, language acquisition, technology-mediated learning, language pedagogy.

I. INTRODUCTION

English speaking has become a must for anyone who wants to be successful in the twenty-first century educational and professional fields. As the level of English proficiency increases, the reading comprehension, writing, and oral communication abilities will improve and it will lead to academic success (Wang et al., 2023). Students with a good understanding of English language are often more confident, more involved in classroom discussions, and usually do better academically. The educational landscape has altered so much in recent years. Digital platforms including social networking sites, video sharing websites, and educational apps can offer learners a range of content to interact with such as videos, subtitles, comments, blogs, and online debates (Dida, 2026). The resources offer immersive and collaborative learning experiences beyond the standard classroom instruction. Language learning programs, virtual environments, and online resources offer an opportunity for real-world language use and the development of useful communication skills. Technology also facilitates self-paced learning in all four language skills namely Listening, Speaking, Reading, and Writing (LSRW) according to the needs of individual students. In addition, such technological advancements conform to the language education with the evolving demands of the digital age, thus bringing about a more comprehensive, stimulating, and learner-centered language pedagogy (Sharma & Bani, 2024).

Much of the focus in English language education has been on digital resources and their potential to enhance learning outcomes and engage learners in immersive learning experiences. This desire is not an exception to language learning (Shadiev & Wang, 2022). Today, teaching and learning should inspire learners to learn knowledge in many learning situations and to develop the skillsets required for the twenty-first century. The usage of digital resources is increasing, but we still do not have a complete understanding of the real implications of these tools, and we have yet to face the challenges of their integration into language-learning environments. For instance, Alshammary and Alhalafawy (2023) reviewed prior studies to investigate the impact of digital platforms on learning outcomes and they found mixed results. Research not only shows that digital resources can create effective learning experiences but also highlights serious issues such as technological barriers, the digital divide, and difficulty to retain student motivation (Manchanayaka, 2023).

A. Background of the study – Related Review Papers and Finding

The digital resources used to study languages have evolved a lot over the years. The 1980s saw the first computers creeping into language classrooms, often as simple programs for vocabulary drills and grammar exercises. In the 1990s interactive and audio-visual materials were provided to learners through multimedia CD-ROMs. With the availability of internet connection in the early 2000s, the rise of online language learning platforms and websites facilitated the proliferation of online resources, based on which the Mobile apps were created in the late 2000s. Easy to learn a language on smartphones and tablets, these digital technologies

have enabled the development of language teaching from traditional classroom teaching to flexible, interactive, and individualized learning experiences (Manchanayaka, 2023). This is an example of how technology can meet the needs, wants, and preferences of the different educational techniques as we see with the growing use of language-learning apps, virtual-reality simulations, online writing tools, and other digital resources (Sharma & Bani, 2024). The usefulness of technology integration in enhancing linguistic ability has been investigated in empirical studies, systematic reviews, and meta-analyses. A review of some notable studies is given below.

Shadiev and Wang (2022) reviewed the research on language learning through technology assisted and development of the 21st century skills. The review analyzed the emphasis of the studies, theoretical frameworks, technical instruments, learning activities, methodology, and findings of the studies from 2011 to February 2022. The results showed a growing tendency during the period of research provided. Most of the studies included research participants who were students of English language acquisition and education.

Al-Jarf (2024) in the systematic review finds that collaborative learning has a great potential to boost the development of language abilities. However, success depends on how collaboration is organized, the cultural relevance of the learning activities, and the continuous instructional assistance that teachers and online learning communities provide.

Kinshuk, Savenye, and Caton (2026) conducted a comprehensive literature review to identify the relational aspects of online literacy, within the framework of higher education and its definitions. This study reveals important aspects of online literacy that may lead to important models of e-literacy to improve student achievement in higher education.

Alshammary and Alhalafawy (2023) conducted a meta-analysis to determine the overall impact of digital platforms on cognitive learning outcomes of the learners when compared to the traditional classroom teaching. Results showed a small but statistically significant overall effect for digital-platform-based learning in the random effects model ($g = 0.278$; $p < 0.001$; $\alpha = 0.05$); 95% confidence interval (0.123–0.433). The study also found no evidence of publication bias in the data analyzed.

The interest in using generative artificial intelligence (GenAI) for language instruction continues to grow, but there are still gaps in the literature among experts, as Lee et al. (2026) pointed out. There is a lack of empirical studies in the classroom with learners to understand the educational affordances of GenAI. Secondly, many reviews combine instructor and learner perspectives, which may obscure learner-specific findings.

Finally, some researches have been limited by a too wide scope or a focus on only one language skill, thus limiting the knowledge about the applicability of GenAI in language acquisition. The present work aims to address these limitations by offering a thorough exploration of GenAI in the classroom for L2 and FL learners, focusing on evidence-based integration, ethical implications, and instructional obstacles. Existing literature not only shows largely positive potential impacts of technology integrated language learning but also points out several downsides and limitations. Although many studies offer suggestions and avenues for future research, the potential of these proposed pathways to overcome the existing limitations remains under-explored. Therefore, this review study aims to investigate the future research suggestions presented in the former studies to minimize the limitations of technology-mediated language learning and contribute to more efficient, inclusive and sustainable language learning environments.

B. Research objectives

The present research is conducted on the basis of the following as research objectives.

1. To identify the limitations pointed out in the existing works
2. To explore the recommended future research scope
3. To examine the impact of technology enhanced learning
4. To correlate the future research scope with the identified limitations

II. METHOGOLOGY

The present review focuses on research articles published between January 2022 and May 2026. Initially, relevant journal articles were identified using search terms such as “technology-assisted language learning,” “the impact of artificial intelligence on communication skills,” and “the digital era in language enrichment.” Searches were conducted across major academic databases and publication sources, including Scopus, Web of Science, and IEEE journals. A total of 265 articles were initially reviewed. During the first stage of blind screening, 58 articles were excluded because their target respondents were not relevant to the scope of the present study. In the second screening stage, which focused on the objectives and research focus of the selected articles, further 98 articles were excluded. During the third stage, 54 articles were removed because they reported repetitive or substantially similar limitations. Consequently, 55 articles were retained for the final data analysis.

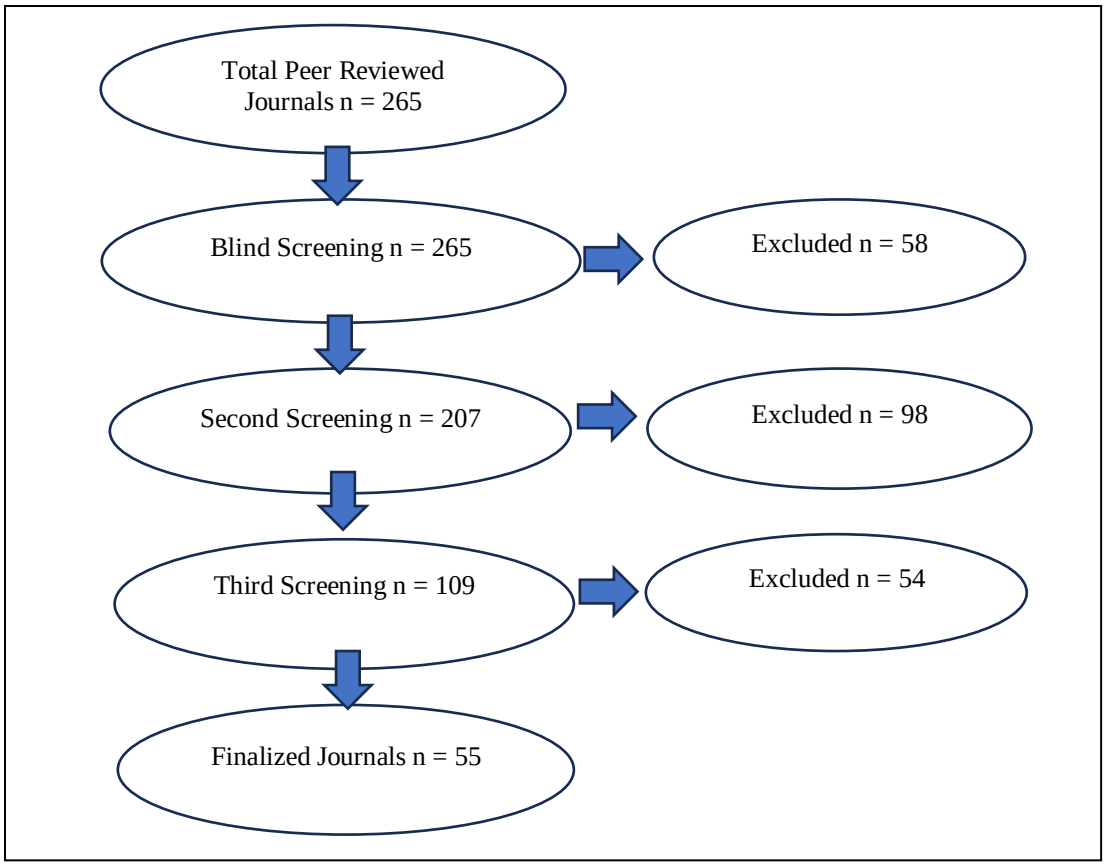


Fig. 1 Screening process of the research

A. Digital tools- Positive impacts

Students gain new knowledge and they also develop crucial abilities such as problem solving, working as a part of a team, creativity, and applying what they have learned to real life situations. These skills enable learners to adjust to the contemporary society and improve their competitiveness (Shadiev et al., 2022). Speaking is usually the most anxiety provoking of the four language skills for English as a Second Language (ESL) learners. Traditional storytelling is still a possible way to develop communicative competence as it can engage even low motivated learners in meaningful narrative contexts (Matiso & Pelokazi, 2023). Google Scholar, academic journals, and online research platforms provide learners with opportunities to engage in academic conversations and terminology relevant to their discipline to develop their formal language skills (Shadiev, Yi, Dang, & Sintawati, 2022).

Moreover, research shows that engaging in language learning activities in an interactive setting enhances students' communication skills and intercultural awareness (Tao & Gao, 2022). Today, in the era of digital connectivity, the convergence of education and technology is inevitable and necessary. Therefore, the application of digital technologies to support teaching and learning processes is increasingly used in present-day educational institutions (Rautela, 2022). In (Marcos 2024) the notion of "internet language" is discussed and it is argued that digital media do not pollute language, but rather they give rise to new types of linguistic diversity that meet the technological and communicative needs of users. Analogously, Manchanayaka, (2023) assessed the impact of digital resources on English language learning outcomes and the barriers to their effective integration.

The results showed that the digital resources were effective to improve learners' motivation and engagement and thus had a positive impact on English-language learning. The participants also improved their language skills and communication abilities. Hashem and Mahdi, (2025) reported that the purposeful and guided use of digital media, particularly interactive content such as educational applications and digital storytelling, can improve learners' vocabulary and narrative skills. The integration of digital tools into language classrooms has also been associated with increased student motivation and engagement. Gamified language-learning platforms and virtual-reality simulations, in particular, can encourage learner enthusiasm and active participation (Moorhouse & Yan, 2023). Thus, digital media play an important role in language development, presenting both valuable opportunities and potential challenges (Marcos, 2024).

Dida (2026) proposed that internet platforms are important informal learning environments for students to practice and improve their English skills outside the official classroom setting. The effect of digital technology on the development of listening, speaking, reading, and writing (LSRW) skills in language-learning settings was explored by Sharma and Bani (2024). Their findings demonstrated the complex effects of technology on language competency and the possibilities arising from the

convergence of language education and digital innovation. Moreover, digital platforms and conventional storytelling may help in improving oral communication skills and eliminating psychosocial barriers such as speaking anxiety (Matiso & Pelokazi, 2023; Osman et al., 2024).

Nale and Kendre (2026) mentioned that the traditional basis of studying English language has been the balanced development of four basic skills: hearing, speaking, reading, and writing. While the fundamental abilities themselves are not changing, the way by which learners acquire them is being reinvented by technology. AI-based feedback, speech-recognition tools, and digital storytelling are no longer add-ons but are becoming part and parcel of contemporary curricula. These technologies can help increase student engagement, reduce anxiety, and create chances for individualized instruction. Similarly, Bala Krishna (2025) contributed vital insights to educators, curriculum designers, and policy-makers about the efficient incorporation of digital technology for the optimization of LSRW-skills development in language-learning environs. However, the advent of AI necessitates the creation of novel strategies to recognize and tackle the problems of technology-mediated language acquisition to make AI a help and not a crutch for learners (Niu et al., 2024). Vani et al., (2022) mentioned that the communication skills of the Engineering students are in the beginner level in Tamil Nadu and enhancing their communication should be accelerated.

Engage Learn is an example of contemporary AI-driven applications that enable users to practice the target language, have relatively informal computer-mediated communication, and receive specific feedback (Jadhav et al., 2024). According to Monika and Suganthan (2024), artificial intelligence (AI) tools like ChatGPT have altered learning processes and language acquisition by helping learners obtain and process information more quickly. The introduction of ChatGPT has marked a significant shift in language learning. Generative AI (GenAI), which is powered by large language models (LLMs), offers capabilities that extend beyond those of earlier AI chatbots (Huang et al., 2022). ChatGPT has the potential to transform conventional approaches to ESL education by providing learners with an interactive platform for developing their language skills (Javaid et al., 2023). Since its introduction in late 2022, GenAI tools have increasingly influenced language education and instructional practices (Chiu, 2023; Karataş et al., 2024).

GenAI is able to promote learner autonomy and mitigate language-learning anxiety while catering to learners with different levels of proficiency and individual variances, such as differences in grit, motivation, and self-efficacy (Ghafouri, 2024; J. H. Lee et al., 2023). The chatbot's improved skills enable it to produce context-aware and natural replies to unpredictable learner input, offering more immersive and interactive language-learning experiences (Jeon & Lee, 2023; Kohnke et al., 2023). The literature points to various pedagogical benefits of GenAI in language education, such as individualized instruction, quick feedback, and tailored support for improving writing, reading, and speaking abilities (Karataş et al., 2024; Pan et al., 2025; Tai & Chen, 2024). GenAI solutions like ChatGPT, Gemini, and Claude promote more natural and context-rich interactions, thereby improving learners' experiences in various language-learning scenarios (Chiu, 2023; Huang et al., 2022; Schneider, 2024)

B. Identified Limitations of Digital Tools

The reviewed articles highlight the following limits and favorable dangers:

Obojska and Vaiouli (2025) explored the use of digital media by users, especially children and young people, for the development of language, literacy, and communication skills, and argue that these media are an excellent learning tool if utilized intelligently.

Its real use in classrooms, as a tool, warrants a comprehensive examination of academic integrity, content bias, quality of feedback, data security (Abdelhalim, 2024; Long, 2024; Zou & Huang, 2023).

Teacher training and professional development are critical in equipping teachers with the online literacy and pedagogical practices necessary for the post-COVID contexts (Muhammad, Sheeraz, & Sacco, 2022).

Artificial intelligence in ESL would disconnect language acquisition by replacing personal relationships and interactions with computers (Monika, M., & Suganthan, C. 2024).

The richness of interaction is often limited in virtual communication platforms which could lead to miscommunication. Communication online is sometimes more fragmented and often less nuanced levels of meaning critical for academic discourse (Ge-Stadnyk, Herring, & Sa, 2025).

Technical hurdles and resource limitations may inhibit effective implementation (Stockwell & Wang, 2023).

The study emphasizes the importance of educational approaches that blend online literacy with the development of robust communication skills, enabling individuals to effectively engage in both digital and in-person conversations (Hashem, R. A., & Mahdi, S. S. 2025).

Challenges faced were technical concerns, deficiencies in online literacy, and diversions. Adequate teacher training and support was emphasized (Manchanayaka, M. A. S. P., 2023).

Effective integration of digital resources calls for careful instructional design to ensure that technology use is aligned with specific English language learning objectives (Moorhouse & Yan, 2023).

Recent reviews (Law, 2024; Lai & Lee, 2024; B. Li et al., 2024; Teng, 2024b; Yang & Li, 2024) have addressed the affordances and ethical implications of GenAI in language teaching.

In addition, concerns are voiced regarding the overreliance on electronic devices and other distractions, urging for a balanced way of using these technologies (Metruk, R 2022).

III. DISCUSSION ON FUTURE RESEARCH SCOPE VS LIMITATIONS

Table I Limitations and Suggested Future Scope

S. No	Identified Limitations	Suggested Future Scope	Source of Future Scope
1	Digital media requires thoughtful implementation for effective learning.	Develop instructional models and evaluate effective integration of digital media and AI into English language classrooms.	(Obojska & Vajouli, 2025); (Coeckelbergh, 2024)
2	Concerns about academic integrity, content bias, feedback quality, and data security.	Investigate AI ethics, academic integrity, assessment equity, responsible AI use, and data privacy in language education.	(Abdelhalim, 2024); (Zou & Huang, 2023); (Pandey & Bhusal, 2024); (Chiu, 2023)
3	Insufficient teacher training and digital competence.	Develop teacher training programmes, digital literacy initiatives, and AI pedagogy for English language teachers.	(Muhammad, Sheeraz & Sacco, 2022); (Coeckelbergh, 2024); Manchanayaka, M. A. S. P., 2023)
4	AI may reduce human interaction in language learning.	Develop hybrid human–AI learning models and investigate teacher perspectives on AI-supported instruction.	(Pandey & Bhusal, 2024);(Chiu, 2023)
5	Online communication lacks interaction richness.	Investigate multimodal AI, collaborative platforms, immersive learning environments, Team-Based Learning, and Peer Instruction.	(Ge-Stadnyk, Herring & Sa, 2025); (Jeon & Lee, 2023); (Van Horn, 2024); (Karataş et al., 2024)
6	Technical barriers and limited infrastructure.	Examine the digital divide, equitable access, student-friendly technologies, and implementation across diverse educational settings.	(Stockwell & Wang, 2023); (Manchanayaka, M. A. S. P., 2023); (Dida, K. E., 2026).
7	Balancing digital literacy with communication competence.	Explore strategies integrating digital literacy with communication skills and investigate diverse learner populations.	(Hashem, R. A., & Mahdi, S.S., 2025); (Manchanayaka, M. A. S. P., 2023); (Alshammary, F. M., & Alhalafawy, W. S., 2023)
8	Technical issues, digital literacy gaps, and learner distractions.	Design adaptive learning platforms, motivational technologies, and digital literacy interventions.	(Manchanayaka, M. A. S. P., 2023); (Alshammary, F. M., & Alhalafawy, W. S., 2023); (Metruk 2022)
9	Need for instructional design aligned with English learning objectives.	Develop AI-supported instructional design models and curriculum frameworks for English language teaching.	(Moorhouse & Yan, 2023); (Coeckelbergh, 2024); (Alshammary, F. M., & Alhalafawy, W. S., 2023)
10	Ethical implications and limited application of GenAI.	Extend GenAI research to speaking, listening, reading, pronunciation, multimodal communication, and different educational contexts; conduct larger, mixed-method, and longitudinal studies.	(Law, 2024); (Lai & Lee, 2024); (Li et al., 2024); (Teng, 2024); (Yang & Li, 2024); (Kohnke et al., 2023); (D. Yan, 2023); (Crompton et al., 2024); (Lee et al., 2025); (B. Li et al., 2024); (Jeon & Lee, 2023); (Van Horn, 2024); (Bower et al., 2024); (Chiu, 2023)
11	Overreliance on digital technologies leading to learner dependency and distraction.	Conduct longitudinal, mixed-method, and qualitative studies using larger samples to determine the optimal balance between AI-assisted and traditional learning while promoting learner autonomy and higher-order thinking.	(Metruk, 2022); (Dida, K. E., 2026); (Shadiev, R., & Wang, X., 2022); (Chiu, 2023)

IV. CONCLUSION

The judicious use of digital technology in the changing terrain of language education holds enormous promise for improving learners' listening, speaking, reading, and writing (LSRW) skills. However, for successful integration of technology, attention needs to be paid to issues of equal access to digital resources, differences in technology amongst learners, and the need for an

optimum balance between digital resources and traditional pedagogical approaches. Sharma & Bani (2024) argue that by adopting new approaches and taking advantage of technology, teachers can create dynamic, inclusive, and learner-centered language learning environments that empower learners to achieve proficiency in all four language skills. The present investigation's findings could offer universities and e-learning centers valuable information about the appropriate use of digital platforms to improve learners' academic and language learning results (Alshammary & Alhalafawy, 2023).

FUTURE RESEARCH SCOPE

Future reviews may be conducted on focusing the listed future research scopes as keywords to select journals.

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