# Teaching Languages with Machines: A Systematic Review on the Effectiveness of AI in ESL Learning

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## Article Info

## Abstract

This systematic literature review investigates the integration of Artificial Intelligence (AI) tools in English as a Second Language (ESL) learning by evaluating their impact on language skill development and learner engagement while determining related challenges and strategies for effective implementation. The review analyzes how tools like ChatGPT, Duolingo, Grammarly, Wordtune, and Pigai are used across instructional phases such as drafting, practice, and assessment to support writing, speaking, listening, vocabulary, grammar, and reading comprehension which are drawn on 19 peer-reviewed studies published between 2021 and 2025. The findings show that AI improves learner motivation, confidence, and participation using personalized, real-time feedback and adaptive learning experiences. However, limitations such as over-reliance on AI, limited contextual understanding, technological challenges, and lack of thorough experimental designs are noted. To address these, the study recommends combining AI with teacher guidance and offering targeted training, expanding AI content for advanced learners and embedding AI literacy into curricula. The review contributes useful insights for educators, researchers, and developers who aim to maximize AI integration in ESL learning.

## Introduction

The continuous advancement of technology has spread through the integration of artificial intelligence (AI) into educational practices which quickly changed traditional models of instruction particularly in language learning. As English continues to express itself as a global lingua franca, the demand for effective English as a Second Language (ESL) instruction has increased. In the middle of this growing demand, AI-powered tools ranging from smart teaching systems to conversational agents and personalized learning platforms have come out as promising support for both learners and teachers. AlTwijri and Alghizzi (2024) indicated that AI applications such as intelligent tutoring systems and personalized learning platforms significantly enhance learners' motivation and engagement while reducing learning anxiety. These outcomes underscore the transformative potential of AI in modernizing ESL instruction and supporting student-centered learning approaches. Liu et al. (2023) found that students who engaged with AI tools showed big improvements in writing skill especially in grammar, vocabulary, and content organization.  The students attribute their progress to immediate and personalized feedback by the AI tools which lead to their greater motivation and involvement. Derakhshan and Ghiasvand (2024) also revealed significant improvements in foreign language enjoyment (FLE), engagement, and motivation and underscored the transformative potential of AI tools in modernizing EFL instruction and supporting student-centered learning approaches.

This study holds strong significance to the changing field of English language education particularly in the context of integrating Artificial Intelligence (AI) tools. Its impact on language learning is important for educators and learners as it becomes increasingly present in educational settings. This study provides different perspectives into the effectiveness of AI tools such as ChatGPT, Grammarly, Duolingo, and Wordtune in improving basic language skills including writing, speaking, grammar, and vocabulary development. The findings support the growing movement toward technology-enhanced learning and contribute to evidence-based teaching practices. It highlights how AI improves learner participation, motivation, and confidence by synthesizing user experiences and understanding from different educational contexts and regions while also uncovering challenges such as over-reliance, lack of contextual understanding, and ethical considerations. These perspectives are valuable in shaping learner-centered instructional designs. The goal of this research is to systematically explore how AI tools are integrated into ESL instruction, identify the specific language learning tasks they support, and assess their impact on student engagement and learning outcomes. It also aims to identify common limitations related with the use of AI in ESL contexts and gather practical recommendations for more effective and responsible implementation. This paper seeks to address the aforementioned dynamics through a detailed review of researches on the use of AI in ESL learning. It aims to respond to three important research questions, which are:

1. What specific phases and tasks of ESL instruction is the Artificial Intelligence (AI) integrated, and what specific language skills does it support?
2. What is the impact of AI-assisted language learning tools on student engagement in ESL contexts?
3. What are the reported limitations and recommended strategies for improving the effectiveness of AI integration in ESL learning?

By addressing these areas, the study seeks to provide educators, researchers, and developers with a clearer

understanding of AI's role in language education and offer evidence-based insights to enhance teaching practices and learner experiences.

## Method

This literature review examines the effectiveness of the integration of AI in ESL instruction using the PICO framework to guide the establishment of related studies on ESL learners, AI-assisted learning tools, traditional or blended instructional methods, and outcomes on student engagement, language skill development, and instructional improvement. To provide proper and transparent methodology, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines shall be followed in the selection, screening, and inclusion of studies. This approach enables a comprehensive synthesis of how AI tools are applied in different instructional phases and tasks in ESL education, the impact on learner outcomes, the limitations observed in various contexts, and the evidence-based recommendations offered to enhance future integration. This literature review investigates the current body of research surrounding the effectiveness of AI applications in ESL learning environments. It assesses how AI enhances language acquisition, learner engagement, and pedagogical outcomes by synthesizing findings from a range of empirical studies. The review also examines issues of access, adaptability, and cultural sensitivity which are challenges and limitations connected with implementing AI in ESL contexts. Through a critical analysis of existing literature, this study seeks to provide a comprehensive understanding of AI's role in shaping the future of language education to inform educators, policymakers, and technology developers about the potential and pitfalls of using AI to support English language learners worldwide.

### Selection Strategy

This study used a systematic literature review methodology to examine the integration of AI tools in English as a Second Language (ESL) or English as a Foreign Language (EFL) learning. The approach was guided by the PRISMA framework to ensure a transparent and structured selection process. The researchers made a comprehensive search of open-access databases to select peer-reviewed studies published between 2021 and 2025 and applied the inclusion and exclusion criteria to select the most relevant literature. The selected studies were then analyzed to establish common trends, findings, limitations, and implications on the use of AI in language learning (see Table 1).

Table 1. Inclusion and Exclusion Criteria

| Criteria | Inclusion | Exclusion |
|---|---|---|
| Language | English | Studies other than English |
| Inclusive Timeline | 2021- May 2025 | Documents before 2021 |
| Publication | Peer-reviewed documents | Books, editorials, short papers |
| Database | Taylor & Francis Journal, Google Scholar, OA.mg, Digital Commons Network, CORE | Other databases |
| Discipline | ESL/EFL | Studies other than ESL/EFL |

**Inclusion and Exclusion Criteria**

Selecting peer-reviewed studies on the integration of AI tools, applications or platforms like ChatGPT, Grammarly, Duolingo or same technologies used to support language skill development such as writing, speaking, grammar, and vocabulary which were published from 2021 to 2025 were incorporated in the inclusion criteria. Studies were included if they involved AI-powered applications or platforms in ESL or EFL learning. Eligible studies used either qualitative, quantitative, or mixed-methods research designs and were done in universities and secondary schools, or language programs. Only articles written in English and available in full text from credible academic databases were selected for analysis. The exclusion criteria applied on research that did not directly involve the use of AI tools in ESL or EFL learning such as general technology integration without an AI component or studies focusing on other subjects outside language learning, studies published before 2021, articles not peer-reviewed, opinion pieces, and those lacking empirical data such as editorials or purely theoretical papers. Research written in languages other than English or not accessible in full text were also omitted together with studies that focused on native English speakers or general education without clear connection to ESL/EFL contexts.

**Procedure**

A systematic search strategy was used following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure a comprehensive and methodologically thorough review. Using the PICO framework, applicable studies were identified by focusing on ESL/EFL learners (Population), the integration of AI tools in language learning (Intervention), comparisons with traditional or blended teaching approaches (Comparison), and outcomes such as writing performance, speaking confidence, vocabulary acquisition, and learner engagement (Outcome). Literature was sourced from distinguished academic databases like Taylor and Francis, Google Scholar, CORE, OA.mg, Digital Commons Network, and other open-access archives. Keywords such as, *AI in ESL/EFL learning, automated feedback in ESL/EFL, and AI-assisted writing tools*, were used to locate empirical studies published between 2021 and 2025. Studies were filtered based on relatedness, methodological accuracy, and alignment with the research objectives, yielding a diverse sample of quantitative, qualitative, and mixed-methods research that reflects the current landscape of AI integration in ESL education (see Figure 1).

Binti Mohamad Shamshul (2023) emphasized the importance of screening articles based on the presence of relevant keywords in titles and abstracts. The carefully selected keywords were used to identify pertinent studies, ensuring that the research questions and content aligned with the focus of the review as well as the originality and focus of the research questions on artificial intelligence integration and ESL or EFL learning. From the list of 5,010 articles, 1,850 were selected after initial screening, and then narrowed down to 19 based on publication date of 2021 and onwards, language which is English only, and exclusion of public materials and non-indexed journals. Greyson et al. (2019) expressed the importance of systematic, comprehensive, and clear search strategies in reviews and stressed that a lack of accurate methodology in search strategies can lead to incomplete or unfair evidence synthesis. A systematic review must employ distinct search protocols which include clear inclusion and

exclusion criteria to ensure the reliability and validity of the findings.

**Identification of Studies via Database**

| | |
|---|---|
| Records identified through database searching: n=5,010 | Number of additional records identified from other source: (n=0) |

**Identification**

Number of records remaining after removing duplicates: (n=1,850)

**Screening**

| | |
|---|---|
| Number of records screened (n=1,850) | Records excluded, with reasons (n=600) |

**Eligibility**

| | |
|---|---|
| Articles assessed eligibility (n=1,250) | Articles excluded, with reasons (n=1,190) |

**Inclusion**

Studies included in the systematic review (n=60)

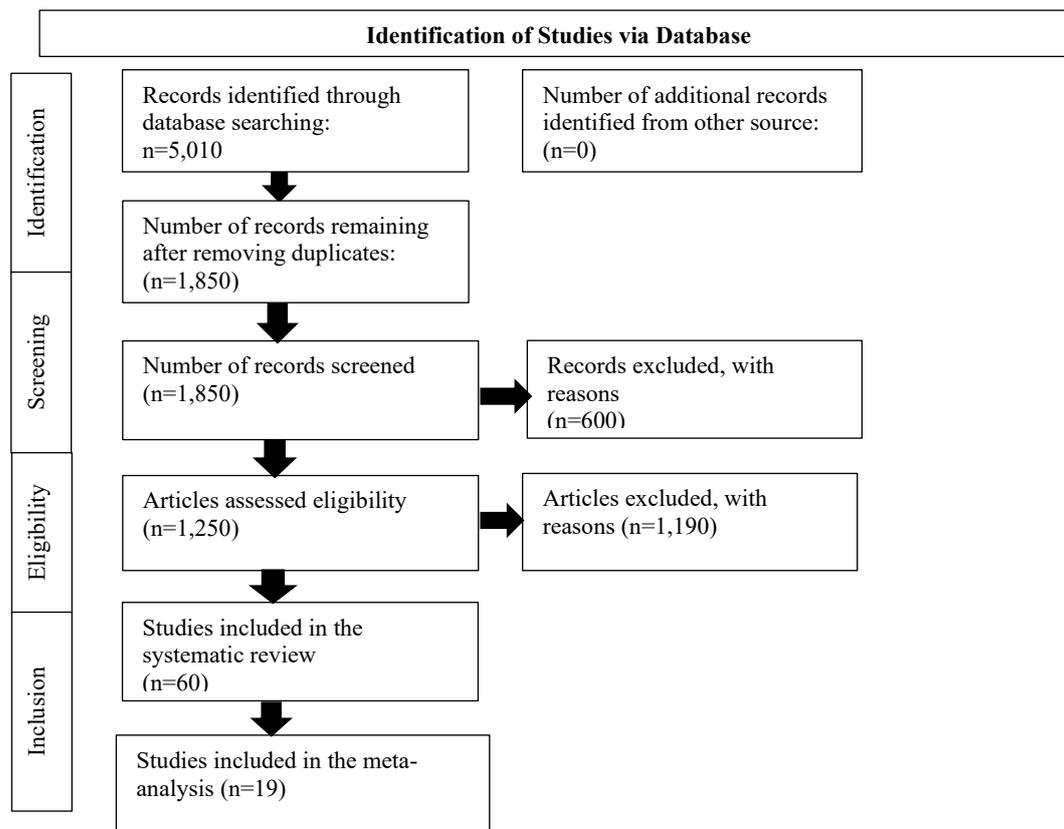Studies included in the meta-analysis (n=19)

Figure 1. Article Selection Process Using PRISMA Approach (Page et al., 2021)

This study focused on the integration of AI in ESL or EFL learning and analyzed 19 selected articles. The selection process followed the educational relevance criteria outlined by Li and Wang (2022) on the use of artificial intelligence (AI) in second language education that used a careful screening process that included keyword relevance, study design quality, and direct applicability to AI-assisted language education, starting with 1,250 articles at the eligibility stage. The articles were accurately reviewed to evaluate their alignment with the focus of research while specific attention was given to those directly relevant to the key themes. Abstracts were primarily scanned to identify suitable topics followed by a full review of the articles.

A qualitative analysis of the content was then conducted to evaluate topic appropriateness which resulted in the inclusion of 19 and the exclusion of 1,231 articles. This careful selection process helped ascertain that the synthesized findings were reliable and meaningful for leading AI integration in language teaching. The selected articles emphasized different AI integration in ESL learning to address the first research question which include ChatGPT, Grammarly, and Duolingo. For the second research question, the literature review examined how these AI integrations were being applied in practice in specific learning activities. The third research question focused on the issues identified in the articles such as limited access to digital resources, insufficient teacher preparedness and training, and reduced in-person interaction with students. These three questions and their findings are discussed in the following section based on the selected articles.

## Results

This presents a comprehensive analysis of recent empirical studies investigating the integration of AI tools in ESL and EFL contexts. Drawing on data from peer-reviewed journals, open-access platforms, and academic repositories such as Taylor & Francis, Google Scholar, OA.mg, Digital Commons Network, CORE, and others, the reviewed studies collectively explore how AI-enhanced tools such as ChatGPT, Duolingo, Grammarly, Wordtune, and Google Read Along affect language learning outcomes, student engagement, writing and speaking proficiency, and digital literacy (see Figure 2).
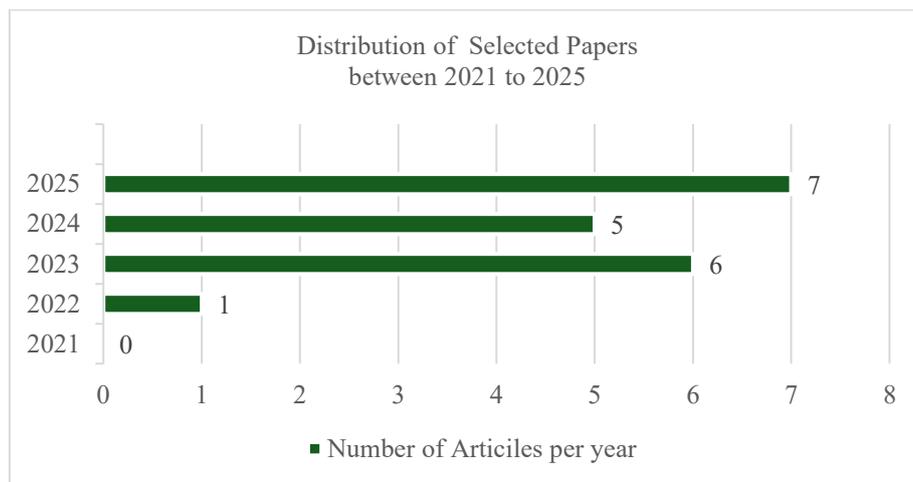


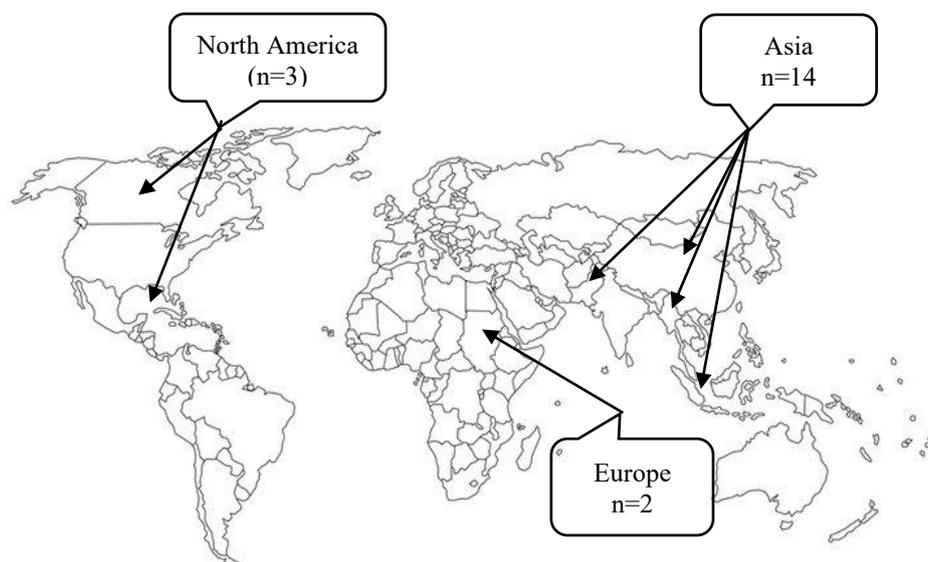Figure 2. Distribution of the Selected Papers Between 2021-2025



Figure 3. Number of Journal Articles per Continent

As provided in Figure 2, after the in-depth selection process, only 19 articles were included in the systematic literature review which were distributed in different years: 2021 with 0, 2022 with 1, 2023 with 6, 2024 with 5, and 2025 with 7 articles. The distribution of the various identified studies on AI integration in ESL learning as

presented noted that 0% or no article was selected from 2021 while only 5% of the total number of articles selected were published in 2022, 30% and 25% of the articles subjected to the review were published in 2023 and 2024 respectively, and 35% of the articles selected were published in 2025. All the articles selected for systematic review aligned with AI integration in ESL learning as gathered from the reputable sources or databases using the inclusion and exclusion criteria (see Figure 3).

After the article selection process following the PRISMA Model (Page et al., 2021) and screening through the inclusion and exclusion criteria, there were 19 articles identified for meta-synthesis systematic review. The selected 19 studies came from various continents: Asia (14 articles: Azerbaijan – 1, China – 5, Indonesia – 3, Kazakhstan – 1, Lebanon – 1, Saudi Arabia – 1, Pakistan – 1, Thailand – 1), North America (3 articles: United States – 3), and Europe (2 articles: Czech Republic – 1, United Kingdom – 1). The total of over 19 studies were selected based on inclusion and exclusion criteria which included methodological accuracy (e.g., quantitative, qualitative, and mixed methods), relevance to ESL/EFL settings, and the presence of AI integration as a central instructional feature. The participants came from diverse demographics, ranging from secondary school learners to university-level students and educators across Asia, the Middle East, Europe, and North America. AI was implemented in different instructional activities such as writing revisions, pronunciation practice, vocabulary acquisition, and academic writing enhancement (see Table 2).

Table 2. Summary of AI Integration in ESL/EFL Learning, their Results and Recommendations

| Author | AI Integration in ESL Learning | Result of the Integration | Recommendation |
|---|---|---|---|
| Petra Poláková and Petra Ivenz (2024) | ChatGPT provided feedback on drafts during the writing instruction phase | Significant improvements in grammar, conciseness, passive voice usage, and inclusion of key content. | Combine AI feedback with teacher input and train students to critically evaluate AI suggestions. |
| Phanwiriyarat, K., Anggoro, K. J., & Chaowanakritsanakul, T. (2025) | Duolingo was used for pre-class speaking practice, focusing on pronunciation, vocabulary, and listening comprehension | Increased student confidence in casual conversations and presentations; reduced anxiety and enhanced engagement. | Expand advanced content in AI-powered platforms like Duolingo to cater to higher proficiency levels. |
| Alghasab, M. B. (2025) | AI tools assisted in drafting, editing, and providing feedback on writing assignments. | Increased engagement through personalized feedback and support. | Combine AI tools with traditional teaching methods to balance technological assistance with human guidance. |
| Bender, S. M. (2024) | AI was integrated into various English language learning activities, including reading, writing, viewing, and interpretation tasks. | Enhanced student engagement by providing interactive and personalized learning experiences. | Emphasize the development of critical thinking skills, ensure ethical use, and provide teacher training to effectively integrate AI tools into the curriculum. |

| Author | AI Integration in ESL Learning | Result of the Integration | Recommendation |
|---|---|---|---|
| Alharbi, K., & Khalil, L. (2023) | AI tools were integrated into vocabulary learning activities, assisting in vocabulary acquisition through personalized and immersive learning experiences. | Increased engagement by providing interactive and personalized learning experiences. | Develop more user-friendly and customizable AI tools, provide comprehensive training, and ensure ethical considerations like data privacy. |
| Wei, L. (2023) | AI was integrated into various language learning activities, including grammar, vocabulary, reading comprehension, and writing tasks. | Increased student engagement through personalized learning experiences and interactive features of the AI platform. | Investigate the long-term impacts of AI-mediated instruction and explore ways to scale its implementation across diverse educational contexts. |
| Bonner, E., Lege, R., & Frazier, E. (2023) | Integrated mainly in writing, speaking, and vocabulary development activities within language lessons. | Increased student motivation and engagement by providing immediate, personalized feedback and interactive language practice. | Encourage blended approaches combining AI tools with teacher guidance, focus on critical thinking about AI outputs, and promote AI literacy among learners and educators. |
| Qiao, H., & Zhao, A. (2023) | AI-based instruction was integrated into speaking activities using the Duolingo application, including interactive exercises, personalized feedback, and speech recognition technology. | Effectively enhanced L2 speaking skills and fostered self-regulatory processes among language learners. | Further research is needed to explore the long-term effects and scalability of AI-based instruction in L2 speaking. |
| Wu, H., Wang, Y., & Wang, Y. (2024) | AI tools were used for grammar correction, speaking practice, chatbot conversation, and personalized content in distributed learning environments. | Learners' intention to use AI was strongly influenced by perceived ease of use and their positive attitude, rather than perceived usefulness. | Enhance the usability and user experience of AI tools and foster positive attitudes to encourage adoption in EFL learning. |
| Yang, H., Gao, C., & Shen, H. (2023) | AI was integrated into the writing revision process through Pigai's feedback system, where students submitted written texts to Pigai, received feedback, and revised their writings | Facilitated iterative writing improvements, with students' engagement varying with different types of feedback. | Explore ways to enhance student engagement with various types of AI-generated feedback and investigate the effectiveness of AI-programmed AWE systems in diverse |

| Author | AI Integration in ESL Learning | Result of the Integration | Recommendation |
|---|---|---|---|
| | accordingly. | | educational contexts. |
| Konyrova, L. K. (2024) | AI was integrated into various aspects of ESL teaching, including personalized learning, assessment, and feedback mechanisms. | Increased student engagement by providing interactive and personalized learning experiences. | Combine AI tools with traditional teaching methods to maintain a balance between technological and human elements in ESL education. |
| Roy, M. (2022) | AI was integrated into ESL learning through various smartphone applications designed to aid in grammar and vocabulary acquisition, including interactive grammar exercises, vocabulary drills, and language practice activities. | Increased student engagement by providing interactive and personalized learning experiences. | Further development of high-quality, user-friendly applications and incorporation of these tools into both classroom and online learning environments to maximize their effectiveness. |
| Mirzayeva, A. (2025) | AI was integrated across various aspects of language learning, including adaptive learning platforms, intelligent speaking tools, automated assessment and feedback systems, and gamified applications. | Increased student engagement by providing personalized, interactive, and accessible learning experiences that catered to individual learning styles and paces. | Adopt a balanced approach that combines AI tools with human expertise, address ethical considerations, ensure equitable access to technology, and provide ongoing training for educators to effectively integrate AI into language teaching. |
| Zhao, X., Sbaffi, L., & Cox, A. (2025) | Wordtune was used during the writing process to assist with rephrasing, grammar correction, and idea expression, including tasks like paraphrasing, rewriting in different tones (formal/casual), and adjusting text length (shortening/expanding). | Users reported overcoming mental blocks and gaining confidence in writing, indicating increased engagement. | Educators should guide students in making informed decisions about digital tools, emphasizing writing strategies over mere grammar correction, and fostering critical awareness of AI tool development and ethical considerations. |
| Suhayati, L. (2025) | Grammarly was integrated into the essay writing process, assisting students in identifying and correcting grammatical errors, including checking | Increased student engagement by providing immediate feedback and enhancing their confidence in writing. | Provide training for students on effectively interpreting and utilizing AI-generated feedback to maximize the benefits of tools like Grammarly. |

| Author | AI Integration in ESL Learning | Result of the Integration | Recommendation |
|---|---|---|---|
| | grammar, sentence structure, and overall writing quality during the drafting and revision stages of essay writing. | | |
| Mali, Y. C. G. (2023) | Primarily used by teachers to support instructional activities such as sharing materials, assigning tasks, and sourcing lesson resources. | Teachers exhibited positive attitudes toward AI and technology integration, acknowledging its potential to improve teaching effectiveness and student learning engagement in EFL classrooms. | Implement professional development programs to enhance teachers' digital skills and competencies for more effective integration of AI and technology in EFL instruction. |
| Hao Hongxia & Abu Bakar Razali (2025) | ChatGPT was integrated into the academic writing process, assisting students in generating ideas, structuring content, and refining language use, including brainstorming, outlining, drafting, and revising academic writing assignments. | Over 60% of students reported increased engagement in academic writing, encompassing affective, cognitive, social, and behavioral dimensions. | Incorporate AI tools like ChatGPT into writing instruction to enhance students' writing skills and engagement, while also emphasizing the importance of critical thinking and ethical use of AI. |
| Dhanan Abimanto & Wasi Sumarsono (2024) | The Google Read Along application, an AI-powered speech recognition tool, was integrated into pronunciation practice sessions, where students practiced reading aloud and received instant feedback on their pronunciation through the app. | Effectively improved students' English pronunciation skills. | Incorporate AI-powered tools like Google Read Along into ESL curricula to enhance pronunciation skills and overall language proficiency. |
| Ayoub, N. N., Joudi, N. S., Bou Saba, M. S., & Bou Saba, A. S. (2025) | AI was integrated into the writing skills course to provide personalized learning, consistent evaluation, and enhanced feedback on grammar, style, and structure, including tasks like drafting, revising, and receiving instant feedback on writing | Increased student engagement by making writing more engaging and effective, as reported by both students and instructors. | Provide training for both instructors and students on the effective use of AI tools, while maintaining the essential role of instructors in fostering creativity and critical thinking. |

| Author | AI Integration in ESL Learning | Result of the Integration | Recommendation |
|---|---|---|---|
| | assignments. | | |
| Mali, Y. C. G. (2023) | Teachers spent approximately 4 hours per week using various technologies for EFL teaching and learning purposes. Common activities included sharing English learning materials, assigning tasks to students, and finding lesson-related resources | Teachers exhibited positive attitudes toward the use of technology in their classrooms. They recognized its potential to enhance teaching and learning experiences | The study suggests the need for professional development programs to improve teachers' skills in utilizing technology effectively. This includes training in digital tools and resources to support EFL instruction. |

Table 2 summarizes the AI integration in ESL/EFL learning in the 19 subjected studies for literature review. It identified the prevailing patterns, highlighted significant findings, and discovered potential gaps in the implementation of AI tools in language learning by analyzing the varied literature. The analysis also explored learner perceptions, instructional benefits, reported limitations, and future recommendations which provided a holistic view of the pedagogical implications of AI in ESL and EFL classrooms.

## Discussion

### Integration of AI in ESL Instruction and Skill Development

Incorporating AI in ESL instruction improved different language skills which include writing, speaking, listening, grammar, pronunciation, vocabulary, and reading comprehension. Tools such as ChatGPT, Grammarly, Duolingo, Wordtune, and Pigai were used across different stages of learning such as drafting, revision, practice, and assessment. Poláková and Ivenz (2024) used ChatGPT to provide writing feedback that focus on grammar, conciseness, and content inclusion which resulted to direct improvements in student writing while Phanwiriyarat et al. (2025) utilized Duolingo in a flipped classroom setting to improve the pronunciation, vocabulary, and listening skills of Thai EFL learners which increased student confidence, reduced language anxiety, and improved learning engagement. Yang et al. (2023) implemented Pigai to direct multiple rounds of writing and revision while Mirzayeva (2025) showcased adaptive AI systems that fitted content to individual needs and learning paces. Yang's and Mirzayeva's stressed how AI supported personalized and iterative learning. These tools encourage self-regulated learning through continuous, personalized feedback and improved student motivation. Across studies, researchers emphasized the importance of combining AI with teacher input to ascertain a balanced approach which supports critical thinking and uphold ethical standards in language education.

### Impact of AI Tools on Student Engagement in ESL Learning

The integration of AI tools in ESL learning has notably improved student engagement by positively influencing

learner interaction, motivation, and participation across key language areas. Tools such as ChatGPT, Duolingo, Grammarly, Wordtune, and other adaptive learning applications or platforms had been applied to activities including writing, speaking, listening, and vocabulary, providing immediate, personalized feedback that boosted confidence and lessened anxiety of learners. Phanwiriyarat et al. (2025) showed that using Duolingo in a gamified flipped classroom improved the confidence in speaking and participation of Thai EFL students by engaging pre-class exercises which targeted pronunciation and listening skills which encouraged a supportive and low-pressure environment for oral language development. Hao and Razali (2025) reported that over 60% of Chinese EFL students became more engaged in scholarly writing when ChatGPT as an AI tool was used in the process. The tool supported the creation of ideas, language refinement, and structural improvements that lead to stronger emotional, cognitive, and behavioral participation of learners. Wei (2023) and Mirzayeva (2025) noted that the adaptability of AI in ESL education supported deeper learning by regulating the content and feedback to the needs of the learners which reinforced motivation and independence. The studies stressed the potential of AI-assisted tools in managing comprehensive, student-centered ESL environments that does not only improve language skills but also promote active and confident learner participation when used with effective instructional support.

**Challenges and Strategic Solutions for Effective AI Integration in ESL**

Some studies highlighted key challenges that affected student engagement and the overall effectiveness of AI-assisted instruction despite the integration of AI tools in ESL education has shown promising results in improving learner interaction, motivation, and participation through personalized, immediate feedback and engaging learning experiences. Bender (2024), Zhao et al. (2025), and Alharbi and Khalil (2023) pointed to ethical concerns, student over-reliance on AI feedback, and data privacy risk as challenges while tools like ChatGPT, Duolingo, Grammarly, and other similar platforms have been effective in supporting skill development and boosting learner confidence. The studies stressed the importance of teacher training and digital literacy to ascertain that learners engage with AI tools objectively and responsibly. Poláková and Ivenz (2024) also noted the necessity for teacher support to guide students in evaluating AI-generated suggestions and developing independent language skills. Phanwiriyarat et al. (2025) noted that AI tools like Duolingo fall short for advanced learners because of the duplicate and limited content which can affect continued participation of learners. Wu et al. (2024) also revealed that the usefulness of tools plays a major role in the engagement of learners such that if an AI tool is hard to use learners are less likely to adopt it regardless of its educational value. The findings suggested that while AI has the capacity to improve engagement in ESL learning its success depends on the thoughtful integration that includes pedagogical support, ethical safeguards, inclusive design, and attention to the diverse needs and proficiency levels of learners.

In summary, AI tools have positively influenced ESL learning by enhancing language skills and improving learner participation using outright feedback for personalized learning. The tools improved the confidence, motivation, and participation of learners when used with effective teaching strategies. However, the challenges remain about ethical considerations and limited adaptability for advanced learners as well as user interface issues.  AI must be effectively and efficiently combined with teacher guidance, critical and evaluative skills development, and inclusive design to create balanced, engaging, and learner-centered ESL environments to sustain its effective use.

## Conclusion

The integration of AI in ESL learning has proven effective in different teaching phases such as drafting, revision, practice, and assessment by enhancing a broad area of language skills including writing, speaking and pronunciation, listening, vocabulary and grammar, and reading comprehension. Studies noted that AI tools such as ChatGPT and Grammarly, Duolingo, Wordtune, and Pigai provided feedback that improved language accuracy while building confidence and promoting active participation among learners. The tools support self-regulated learning which are appropriate to their individual needs including writing support and interactive speaking exercises or other adaptive learning platforms. However, research consistently emphasized that there is the need for a blended approach which combines AI with teacher guidance to promote critical thinking and ethical use in a balanced and effective language instruction.

## Recommendations

It is strongly advised to blend AI-generated feedback with teacher guidance to prevent over-reliance on technology and support deeper and critical learning to achieve effective and responsible integration of AI in ESL instruction. Students and teachers should receive targeted training to develop the skills needed to interpret and use AI tools effectively. The AI integration tool in ESL learning must expand content to include varied and high-level language exercises to cover intermediate and advanced learners and address issues related to data privacy and algorithmic bias as well as disparities in access to ensure ethical and equitable use. Integrating AI literacy into the curriculum is fundamental to helping students evaluate AI outputs and interact with the tools responsibly and effectively.

## Limitation

The research on AI integration in ESL education presents several limitations that must be considered when interpreting findings. Over-reliance on AI tools may impede the development of learners' independent thinking, creativity, and problem-solving skills, as students might depend too heavily on automated feedback. Some AI tools find difficulty with understanding context, tone, and distinction which can result in misleading or inappropriate language suggestions. Many studies depended on a small group of participants which hinder the reliability of results in various educational landscapes. Most research focused on short-term outcomes that leaves the long-term impact on language proficiency and retention largely unexplored. Some technological challenges such as limited access to reliable internet, appropriate devices, and user-friendly interfaces also posed challenges particularly in under-resourced contexts. Furthermore, the absence of control groups in some studies weakens the capacity to draw strong causal conclusions about AI's effectiveness in language learning.

## Acknowledgements

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