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The Role of Artificial Intelligence in Educational Practices for English as a Foreign Language (EFL) University Education: A Systematic Literature Review

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Abstract
This systematic literature review synthesises findings from 24 peer-reviewed studies on the role of Artificial Intelligence (AI) in English as a Foreign Language (EFL) university education. The review reveals that AI technologies significantly advance language learning by offering personalised support, enhancing writing skills, and optimising feedback mechanisms. AI tools have been shown to improve language proficiency, foster student engagement, and increase motivation, while also presenting challenges such as digital literacy disparities and ethical concerns. Using a structured search across Google Scholar, ERIC, and ScienceDirect, the review analysed empirical studies published in 2024, focusing on experimental and quantitative research in EFL higher education. Tools such as ChatGPT, Grammarly, Quillbot, and custom chatbots are used for grammar correction, automated feedback, interactive conversation, plagiarism detection, and personalised learning. These tools have demonstrated effectiveness in improving students' speaking fluency, writing quality, vocabulary acquisition, critical thinking, and learner autonomy. Additional challenges include a lack of teacher training, infrastructure limitations, and concerns that overreliance on AI may undermine human instruction. This review highlights AI's potential to revolutionise EFL education and underscores the necessity for thoughtful implementation to address these challenges effectively.
Keywords: Artificial Intelligence, EFL education, language learning, systematic review, educational technology

ملخص
تُقدِّم هذه المراجعة المنهجية للأدبيات خلاصةً لنتائج 24 دراسة محكّمة حول دور الذكاء الاصطناعي في تعليم اللغة الإنجليزية كلغة أجنبية (EFL) في التعليم الجامعي. تكشف المراجعة أن تقنيات الذكاء الاصطناعي تُسهم بشكل كبير في تطوير تعلُّم اللغة من خلال تقديم دعم شخصي، وتعزيز مهارات الكتابة، وتحسين آليات التغذية الراجعة. كما تُظهر الأدوات القائمة على الذكاء الاصطناعي قدرتها على تحسين الكفاءة اللغوية، وزيادة تفاعل الطلاب، ورفع مستوى الدافعية، مع الإشارة إلى تحديات مثل الفجوات في المهارات الرقمية والقضايا الأخلاقية. ومن خلال بحث منهجي في قواعد بيانات Google Scholar وERIC وScience Direct، حلّلت المراجعة دراسات تجريبية وكمية نُشرت في عام 2024، ركّزت على التعليم الجامعي في مجال EFL. وتشمل الأدوات المستخدمة ChatGPT: و Grammarly وQuillbot وروبوتات محادثة مخصصة. وتُستخدم هذه الأدوات في تصحيح القواعد، وتقديم تغذية راجعة تلقائية، وتفعيل المحادثة التفاعلية، والكشف عن الانتحال، وتقديم تعلم شخصي. وقد أظهرت الدراسات أن هذه الأدوات تُسهم في تحسين طلاقة التحدث، وجودة الكتابة، واكتساب المفردات، والتفكير النقدي، والاستقلالية في التعلُّم. وتشمل التحديات الإضافية: نقص تدريب المعلمين، وضعف البنية التحتية، والمخاوف من أن الإفراط في الاعتماد على الذكاء الاصطناعي قد يُضعف دور المعلم البشري. وتُبرز هذه المراجعة الإمكانات الثورية للذكاء الاصطناعي في تعليمEFL ، وتُشدد على ضرورة التنفيذ المدروس لمعالجة هذه التحديات بفعالية.
كلمات مفتاحية :الذكاء الاصطناعي، تعليم اللغة الإنجليزية كلغة أجنبية، تعلُّم اللغة، مراجعة منهجية، التكنولوجيا التعليمية.

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Introduction

The integration of Artificial Intelligence (AI) into the various aspects of education offers a wide range of applications that aim to enhance the teaching and learning experience. Research has identified key areas where AI is making significant contributions to education. These include personalised learning through adaptive systems and intelligent tutoring systems, assessment and evaluation processes, as well as institutional and administrative services (Zawacki-Richter et al., 2019). The potential of AI in education management is noticeable for optimizing the teaching and learning process in higher education, therefore offering opportunities to enhance educational practices and outcomes (Siminto, 2023). Additionally, the ethical considerations surrounding the use of AI in education are crucial, as AI brings both benefits and risks to various aspects of human activities, including education (Klímová et al., 2023). By recognising the challenges and opportunities that AI presents, educators and policymakers can collaborate to develop a more inclusive, efficient, and effective educational system that equips learners for the demands of the 21st century (Agarwal, 2024).

In the realm of English as a Foreign Language education, the integration of AI holds a transformative potential that can impact both teaching and learning alike. Studies have highlighted the importance of AI in EFL contexts by emphasizing its role in enhancing student motivation, improving writing skills, and supporting personalised learning experiences (Moybeka, 2023). AI tools such as chatbots, generative AI, and recognition technologies have been shown to facilitate language learning by providing efficient, reliable, and adaptable support to students, ultimately enhancing their overall learning experiences. By leveraging AI technologies, EFL educators can enhance the quality of instruction, support student engagement, and foster a more dynamic and interactive learning environment that caters to the diverse needs of language learners (Muslimin et al., 2024).

Furthermore, the incorporation of AI in EFL education underscores the need for educators to receive extensive pedagogical training, develop interdisciplinary collaborations, and align AI applications with instructional goals to ensure effective integration and guidance for students (Yaseen, 2023). By addressing long-term efficacy concerns and fostering a collaborative relationship between human teachers and AI, stakeholders in EFL education can harness the benefits of AI technology while upholding ethical standards and promoting meaningful educational experiences for language learners (Yaseen, 2023).

This systematic literature review aims to investigate the perceptions and attitudes of teachers and students towards the use of AI in EFL university education and how these perceptions influence the implementation and effectiveness of AI tools. It will identify gaps in the existing literature and recommend strategies to enhance AI integration in EFL education. The review seeks to offer practical recommendations for educators, policymakers, and technology developers on effectively implementing AI tools, integrating them into the curriculum, and supporting continuous improvement in EFL teaching and learning. By systematically reviewing and analysing existing research, the review will assess the benefits and challenges of AI in EFL education and inform educators, policymakers, and technology developers about the current state of AI integration and areas needing further exploration.

On this basis, this paper answers the following research questions:
RQ1: How are AI technologies and tools being applied in EFL university education, and how can they be categorised based on their functionalities?

RQ2: What are the effectiveness and perceived benefits of AI tools in improving EFL students' language skills, proficiency, and overall learning outcomes?

RQ3: What challenges and limitations are associated with the adoption of AI technologies in EFL teaching and learning?

Methods and Materials

To ascertain the current status of research for this systematic review, a comprehensive search was conducted utilising two primary databases: Google Scholar, the Education Resources Information Centre (ERIC) and Science Direct. A group of 24 articles could be systematically obtained. These databases were selected due to their coverage of educational research and range of academic sources. They were also chosen for their broad access to a wide range of academic disciplines and the inclusion of peer-reviewed articles. The search formula applied to obtain relevant studies was designed according to subject, educational approach, context, and level, and was based on recommendations for systematic reviews in educational research (Zawacki-Richter et al., 2019).

Table 1. *Search strategy*

Category	Terms	Operator
Search Terms	"Artificial Intelligence" AND "education" AND "EFL" AND "higher"	AND
Exclusion Terms	"Systematic literature review" OR "systematic review" OR "review article" OR "meta-analysis" OR "scoping review" OR "bibliometric"	NOT
Additional Terms	"Artificial Intelligence" OR "EFL" OR "foreign language" OR "experiment" OR "quantitative"	OR

To identify relevant literature for this systematic review, a Boolean search strategy was employed, detailed in the following Table One. The strategy was designed to ensure a focus on AI applications in EFL university education across the databases. Only peer-reviewed journal articles were included in this phase to ensure the use of credible and high-quality research.

Table 2. *Inclusion and exclusion criteria*

Inclusion	Exclusion
Articles published in 2024	Articles published before 2024
Article written in English	Article in a language other than English.
Peer-reviewed journal articles	Books, Conference papers and grey literature
Experimental or quantitative studies	Systematic literature, Descriptive or non-empirical research
Addresses AI in an EFL university context	Does not address AI in an EFL university context
Available as a full-text	Not available as a full-text

Inclusion criteria focused on articles published in 2024, written in English, peer-reviewed, and addressing AI in EFL university education. Also, quantitative or mixed methods studies were

chosen, ensuring the majority of the Research Design was either experimental or a questionnaire, so the research selected was conducted in the field. Exclusion criteria filtered out older publications, non-English articles, and non-empirical research, ensuring only relevant, high-quality studies were included, as referred to in Table Two.

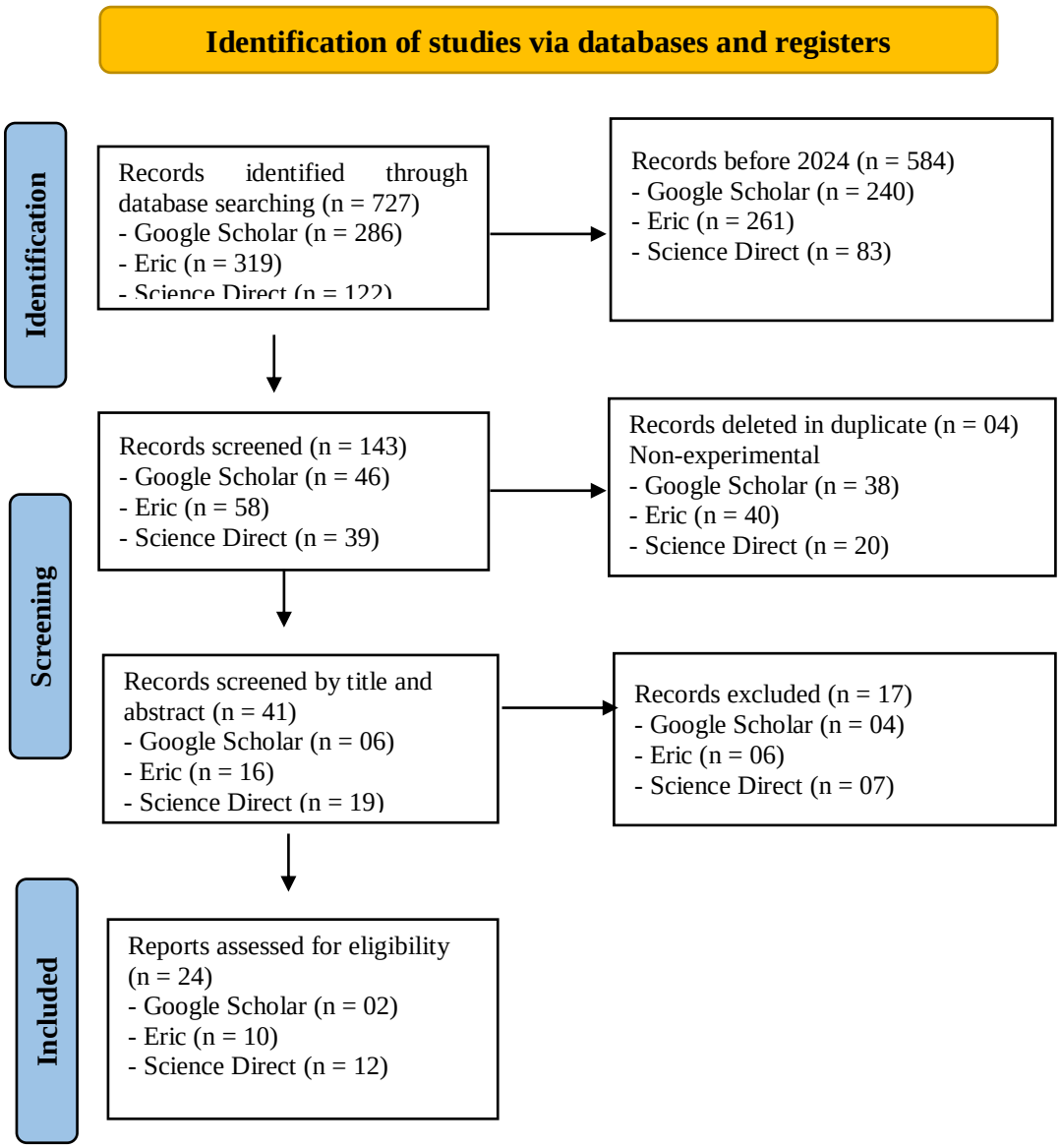

Figure 2. PRISMA flow diagram

The identification and screening process, as shown in Figure One, following the Statement of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, involved a thorough search across multiple databases, including Google Scholar, Eric, and Science Direct. Initially, 727 records were identified, with 584 records dated before 2024. After removing duplicates and non-experimental studies, 143 records were screened by title and abstract. This led to the exclusion of 16 records, leaving 41 records for a more detailed review. Ultimately, 24 reports were assessed for eligibility, ensuring a selection process to include relevant studies for this review.

Results

This section presents the findings from the systematic literature review on the role of AI in EFL university education. The results are organized according to the research questions, addressing the application and categorization of AI technologies, their effectiveness in improving language skills, perceived benefits, and the challenges (see Appendix A) and findings associated with their adoption. Data from 24 articles were summarized to provide a comprehensive overview. The following details the findings for each research question.

RQ1: Application and Categorization of AI Technologies

The reviewed studies reveal that various AI tools were used in EFL university education, including ChatGPT, Grammarly, Quillbot, self-made chatbots, and AI-based chatbots like Andy English Chatbot. ChatGPT (Cong-Lem et al., 2024; Fathi et al., 2024; Gao et al., 2024) was the most utilized for providing automated feedback, enhancing writing, and facilitating conversational practice. Grammarly and Quillbot (Gozali et al., 2024; Xiaolei & Teng, 2024; Zhang et al., 2024) focus on grammar correction, style improvement, and idea generation. Additionally, tools such as Turnitin and AI KAKU (Cong-Lem et al., 2024; Ghafouri, 2024) were employed for plagiarism detection and providing feedback on student submissions. Bing AI and OpenAI's GPT-4 (M. Liu et al., 2024) facilitate multimodal composing by offering feedback and text generation. AI-powered chatbots like Andy English Chatbot enhance speaking fluency and vocabulary through interactive conversation practice, whereas tools like TalkAI SpeakG and Wenxin Yiyan boost student engagement and motivation by providing interactive and engaging learning experiences.

RQ2: Effectiveness and Perceived Benefits of AI Tools

The effectiveness and perceived benefits of AI tools in improving EFL students' language skills and learning outcomes are well-documented in the literature. For instance, Huang and Zou (2024) found that tools like EAP Talk significantly enhance speaking fluency, pronunciation, and accuracy, while Fathi et al. (2024) reported that the Andy English Chatbot improves students' speaking skills. Studies by Mahapatra (2024) and Tseng and Lin (2024) demonstrate that ChatGPT and similar tools improve writing, organisation, coherence, and the overall quality of written assignments. Gao et al. (2024) and Rahimi and Sevilla-Pavón (2024) show that AI tools promote academic achievement and enhance self-evaluation and critical thinking skills. The personalised feedback provided by AI tools, as noted by Ji and Han (2024) and Xiaolei and Teng (2024), helps students improve specific language skills tailored to their needs. Furthermore, AI tools significantly increase student engagement by providing interactive and personalised learning experiences, as highlighted by Wang and Xue (2024) and Zhai et al. (2024). These tools improve various language skills, including speaking, writing, and vocabulary, as reported by Zhang et al. (2024). AI technologies support personalised learning, boosting students' confidence and autonomy, as noted by Jamshed et al. (2024) and Guo and Li (2024). Additionally, AI tools enhance critical thinking, creativity, and independent learning, as observed by Cong-Lem et al. (2024) and Hong et al. (2024).

RQ3: Challenges and Limitations

Despite the benefits, several challenges and limitations are associated with adopting AI technologies in EFL education. Technical and reliability issues are prominent concerns,

including the reliability and privacy of AI tools (Gao et al., 2024; Rahimi & Sevilla-Pavón, 2024) and the over-reliance on AI, which may hinder critical thinking, as stated by Cong-Lem et al. (2024). Other challenges, such as pedagogical and implementation ones, include difficulties in identifying AI-generated texts and the need for extensive teacher training in AI integration, as noted by Fleckenstein et al. (2024). Ethical and privacy concerns are also highlighted, particularly regarding the ethical use of AI and the privacy of student data, as mentioned by Molefi et al. (2024) and Jamshed et al. (2024). Lastly, resource and accessibility issues such as digital connectivity disparities and the high costs of AI tools pose significant barriers to their widespread adoption, as observed by Muslimin et al. (2024) and Ghaithi et al. (2024).

Discussion

This research article offers a systematic review of 24 peer-reviewed articles. The studies have generally presented the successful integration of various AI tools into the EFL educational practice, as well as a rigorous description of the components and characteristics of their application of AI-based technologies and the questioning of said AI.

The review highlighted a variety of AI tools employed in EFL university education. These tools are categorised based on their primary functionalities. Language enhancement tools, such as ChatGPT, Grammarly, and Quillbot, were widely used for providing automated feedback, enhancing writing, grammar correction, and idea generation. ChatGPT, in particular, facilitates conversational practice, which is crucial for language learning. AI-based chatbots like Andy English Chatbot improve speaking fluency and vocabulary through interactive conversation practice. Assessment and feedback tools like Turnitin and AI KAKU are primarily used for plagiarism detection and providing feedback on student submissions, ensuring academic integrity and enhancing the quality of student work. Multimodal learning tools, such as Bing AI and OpenAI's GPT-4, offer feedback and text generation, facilitating multimodal composing, which is essential for developing comprehensive language skills. The categorisation highlights the diverse functionalities of AI tools, reflecting their versatility in addressing various aspects of language learning and teaching in EFL contexts.

The effectiveness of AI tools in improving EFL students' language skills and learning outcomes is well-documented. Studies indicate significant improvements in various language skills, such as speaking fluency and pronunciation, writing, and grammar. Tools like EAP Talk and Andy English Chatbot have been shown to significantly enhance speaking fluency, pronunciation, and accuracy. The interactive nature of these tools provides students with ample opportunities to practice and receive immediate feedback. Similarly, tools such as Grammarly and Quillbot have been effective in improving writing skills by providing detailed feedback on grammar, style, and coherence. These tools help students refine their writing, making it more coherent and grammatically correct. The effectiveness of these tools is attributed to their ability to provide immediate, personalised feedback, which is crucial for language learning. This feedback loop helps students identify and correct their mistakes, thereby enhancing their language proficiency. The perceived benefits of using AI in EFL education are multifaceted. AI tools are reported to increase student engagement by making learning more interactive and enjoyable. The use of chatbots and other interactive tools helps in maintaining student interest and motivation. Additionally, AI technologies offer personalised learning experiences by adapting to individual student needs and learning paces. This customization is particularly

beneficial in a diverse classroom setting where students have varying levels of proficiency and learning styles. The immediate and detailed feedback provided by AI tools helps students to learn more effectively. This efficiency reduces the burden on teachers, allowing them to focus on more complex teaching tasks and provide additional support to students who need it.

Despite the numerous benefits, AI technologies in EFL education come with challenges and limitations. The implementation of AI tools requires a reliable technological infrastructure. Technical glitches and connectivity issues can hinder the learning process, causing frustration among students and teachers alike. Effective integration of AI tools requires teachers to be adequately trained. There is often resistance from educators who are not familiar with these technologies or are sceptical about their effectiveness. Providing sufficient training and support is essential for successful implementation. The use of AI in education raises ethical issues related to data privacy and the potential for bias in AI algorithms. Ensuring that AI tools are used responsibly and ethically is a major concern that needs to be addressed by policymakers and educators. Additionally, the high cost of advanced AI tools can be a barrier for many educational institutions, especially in developing regions. Ensuring equitable access to these technologies is crucial for leveraging their benefits across diverse educational settings.

Conclusion

The integration of AI into EFL university education presents a transformative opportunity to enhance both teaching and learning experiences. The reviewed studies underscore a wide range of applications and significant benefits offered by AI tools. These tools have been shown to improve language skills, provide personalized learning experiences, and increase student engagement. AI technologies enable more tailored instruction, facilitate individualized feedback, and support diverse learning needs, which collectively contribute to a more dynamic and responsive educational environment.

Despite these advantages, the adoption of AI in EFL education is not without its challenges. Technical issues, such as software compatibility, Availability and system reliability, pose barriers to effective implementation. Additionally, the need for comprehensive teacher training is crucial to ensure that educators are well-equipped to integrate AI tools into their teaching practices. Ethical concerns regarding privacy, algorithmic bias, and the potential for reduced human interaction also require careful consideration. Moreover, the cost of AI technologies can be a significant hurdle, particularly for institutions with limited resources, not to mention students. Addressing these challenges is essential for fully realising the potential of AI in enhancing educational outcomes.

Overall, the review suggests a promising future for AI in EFL education. AI has the potential to positively influence language skills, learners' motivation, and their attitudes toward learning. This is evidenced by the growing number of publications on this topic, particularly from Asian and Chinese scholars. The increasing scholarly interest in AI’s role in EFL education reflects a broader recognition of its potential to drive significant advancements in language education, paving the way for more innovative and effective teaching and learning methodologies.

Limitations of the Review

This review is limited by the scope of the literature included and potential biases in the selection of studies. The reliance on experimental data from a limited number of articles may

affect the generalizability of the findings. Future reviews should consider a broader range of studies and include more diverse educational contexts to provide a more comprehensive understanding of the role of AI in EFL education.

Recommendations

AI tools used in existing studies, such as ChatGPT and chatbots, have primarily served as tutors or assistants. Integrating a wider range of AI applications that can offer personalised learning experiences and adapt to individual learners' needs. Furthermore, the scarcity of longitudinal studies with large participant groups limits the ability to assess the long-term effectiveness of AI technologies. Future research should focus on conducting such studies to provide a more comprehensive evaluation.

Furthermore, there is a need for better teacher training in the use of AI technologies. Inadequate training can lead to improper use of AI, which may demotivate students and hinder learning. Ensuring that teachers are well-prepared to integrate AI into their teaching practices is crucial for maximizing the benefits of these technologies. Addressing these gaps will enhance the effectiveness of AI in EFL education and support more meaningful learning outcomes.

The review aligns with Zawacki-Richter et al.'s (2019) call for more research on AI integration throughout the student lifecycle. It also highlights the need for clearer instructional methods, ethical considerations, and the incorporation of longitudinal and qualitative research. The findings offer valuable insights for learners, researchers, educators, and curriculum designers, suggesting that AI can enhance learning experiences by providing adaptive, interactive, and personalized opportunities.

Future research should focus on investigating the long-term impact of AI tools on EFL education to determine whether the observed improvements in language skills are sustainable over time. It should also explore AI's application across various educational settings and learner populations to understand its broader implications. Additionally, comprehensive evaluations are needed to address technical, pedagogical, and ethical challenges associated with AI. By focusing on these areas, future research can enhance our understanding of AI's role in EFL education and inform the development of effective and ethical AI-based educational practices.

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Declaration of AI Refined

This document has benefited from the application of AI-driven tools, including Grammarly and Scholar AI Chat, to refine its linguistic aspects. These tools were utilised to correct grammar and spelling and improve the overall writing style. It is acknowledged that the use of these

technologies may introduce certain AI-generated linguistic patterns. However, the core intellectual content, data interpretation, and conclusions presented remain the sole work of the authors.

Statement of Absence of Conflict of Interest

The authors declare that there are no conflicts of interest related to the research, findings, or recommendations presented in this paper. All conclusions drawn are independent and unbiased.

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Appendices

Appendix A

Summary of Included Studies

Author	Participants	AI Tool	Skills	Benefits	Challenges
(Cong-Lem et al., 2024)	31 EFL teachers from Vietnam	ChatGPT Turnitin	Critical thinking Creativity Independence	Enhances language teaching, promotes critical thinking and genuine learning motivation, and supports personalised learning.	AI-driven plagiarism, over-reliance on AI hinders critical thinking and language proficiency, and concerns about AI-generated work.
(Fathi et al., 2024)	65 EFL learners	AI-mediated Chatbot (Andy English Chatbot)	Speaking Fluency Lexicon Accuracy pronunciation	Enhances speaking skills, and personalised feedback, improves confidence, vocabulary, grammar, and pronunciation.	Small sample size, short study timeframe, exposure to different instructional methods
(Fleckenstein et al., 2024)	89 pre-service teachers (German university) 200 teachers (UK)	ChatGPT	Assessment	Improves teachers' assessment, encourages focus on skills AI cannot replicate, and promotes ethical AI integration.	Difficulty identifying AI-generated texts, Overconfidence of teachers
(Foung et al., 2024)	74 engineering, computing, and biochemistry students	ChatGPT Premium AI tools	Tool selection Evaluation	Levels of language proficiency field, and promotes balanced tool usage.	Generalizability issues, impact of the interviewer and coder
(Gao et al., 2024)	95 Chinese EFL university teachers	ChatGPT	Self-evaluation Writing	Enhances academic achievement and promotes subjective learning.	Neglect of traditional resources, concerns about reliability and privacy
(Ghafouri, 2024)	30 Iranian EFL learners	ChatGPT AI KAKU	Building Rapport	Enhances teacher-student rapport and L2 grit, promotes emotional support, and engagement.	Lack of experimental trials, overreliance on correlational analyses

(Ghaithi et al., 2024)	150 Omani EFL learners	AI-based chatbots	Vocabulary Interaction	Improves confidence, motivation, and self-efficacy.	Slow development, limited use in language learning.
(Gozali et al., 2024)	18 undergraduate students in Indonesia.	ChatGPT Grammarly Quillbot	Feedback Processing Grammar	Enhances grammar, style, and idea generation.	Incomplete knowledge, over-reliance on technology
(Guo & Li, 2024)	69 Chinese undergraduate students	Self-made Chatbots Poe	Writing Motivation	Enhances writing motivation and confidence, tailored support.	Lack of contextual information, outdated knowledge
(Hong et al., 2024)	30 College students	ChatGPT	Analysis Reasoning	Enhances critical thinking skills, encourages active research, and facilitates peer review sessions.	Analysing diverse viewpoints, generating counterarguments effectively. - Skills Mentioned: Discernment, analysis, and reasoning.
(Huang & Zou, 2024)	203 EFL learners from 04 Chinese universities	EAP Talk	Speaking	Enhances speaking fluency, pronunciation, and accuracy.	Limited sample size, cultural influences not considered
(Jamshed et al., 2024)	258 Saudi EFL students	ChatGPT And AI-powered tools	Autonomous Learning	Enhances personalised and self-learning, and increases self-confidence.	Privacy concerns, high costs
(Ji & Han, 2024)	One male and four female learners in their twenties	Various tools	Vocabulary Pronunciation Comprehension	Enhances teaching practices with individualized feedback, provides relief from language anxiety, and improves conversational skills.	Limited classroom interactions are needed for diverse learner inclusion, and the limited study scope.
(Liu & Ma, 2024)	405 ChatGPT users from Chinese EFL backgrounds	ChatGPT	Ai acceptance	Benefits of informal digital English learning include ease of use and usefulness.	Gender ratio imbalance, reliability and construct validity issues
(Liu et al.,	08 Chinese	ChatGPT	Writing,	Enhances text	Challenges with AI

2024)	international undergrad students	Bing Ai Quillbot OpenAI's GPT-4 DALLE-2	Multimodal composing	generation and facilitates multimodal composing.	image reasonability, style preferences, and correlating information
(Mahapatra, 2024)	1st-year science and engineering students	ChatGPT	Writing Feedback	Offers tailored feedback, and overcomes language barriers.	Implementing formative feedback in large classrooms, addressing individual needs
(Molefi et al., 2024)	315 in-service teachers	Various tools	Technical proficiency Integration.	Enhances professional development, shapes intentions to use AI, and advocates for supportive policies.	Digital connectivity disparities, ethical limitations, and privacy concerns
(Muslimin et al., 2024)	126 EFL students from an English education department in Indonesia	Cami AI and Cami AI-SAMR framework	Writing Creativity Critical thinking	Enhanced learning engagement and personalised feedback.	Connectivity issues, limited features.
(Rahimi & Sevilla-Pavón, 2024)	124 Iranian in-service EFL teachers	ChatGPT	Adaptation	Enhances teaching innovation and accountability.	Negative preconceptions, limited usage
(Tseng & Lin, 2024)	15 participants in a Taiwanese university	OpenAI's GPT-3.5	Writing Organization	Provides immediate feedback and cohesive organisation.	Writing organisation, peer review limitations.
(Wang & Xue, 2024)	113 EFL students	Chatbots: (TalkAI, SpeakG, Wenxin Yiyan, Xunfei Xinghuo)	Engagement	Enhances academic engagement, cognitive, behavioural, and emotional engagement.	Limited participant number, reliance on self-report questionnaire
(Xiaolei & Teng, 2024)	204 sophomore EFL learners	ChatGPT Grammarly Quillbot	Critical thinking Autonomous learning Writing	Enhances language proficiency, provides immediate feedback, and mitigates over-reliance on AI.	Limited metacognitive awareness and motivation challenges

(Zhai et al., 2024)	37 participants (diverse backgrounds)	OpenAI GPT-2, GPT-3, Replika Kuki Wysa	Engagement Motivation	Enhances learning, boosts motivation and engagement.	Repetitive or unrelated questions, clichéd feedback
(Zhang et al., 2024)	30 College students	Grammarly ChatGPT	Writing	Enhances test scores, provides free services for spelling, punctuation, and grammar issues, and offers immediate suggestions.	Overlooks nuanced collocation and redundancy issues, challenges in lexical, syntactic, and segmental dimensions

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