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# Artificial Intelligence in English Language Teaching: A Systematic Analysis of Global Trends

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**Abstract**

As technology develops, the studies to find out the potential integrations and implications of these technological developments in the field of English language teaching increase. Grounded on this growing interest, the identification of global trends in published research studies in reputable journals plays a critical role. It is believed that if researchers, practitioners, and educators are aware of the trends and potential gaps in the field, they could conduct more fruitful studies to implement artificial intelligence to teach and learn the English language. The present research, with a combination of systematic and descriptive bibliometric analysis, focuses on the studies indexed in the Web of Science Database with some keywords related to the topic under investigation. The created data pool for content analysis consisted of sixty-six studies, and the publication years, target population, and themes of the studies were identified. According to preliminary findings, out of 66 studies, 52 of them were published after 2023, and the top three countries were China, Iran, and the USA. The main research area of the studies is the use of AI for writing and speaking skills, with less focus on other language skills. The main findings of the studies are focused on the positive impacts of AI on language learning, especially writing and pronunciation, and the challenges faced in AI integration.

***Keywords:*** Artificial intelligence; global trends; English language education; research gaps



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## 1. Introduction

### *1.1. The background of the study*

The role of technology in language education has become increasingly critical, particularly in enhancing teaching techniques and learning experiences. The integration of technology in language classrooms enhances the language learning environment by creating a more engaging and effective learning process, allowing both language educators and language learners to leverage various digital tools and resources to improve language learning.

Artificial intelligence (AI), defined as "the science and engineering of making intelligent machines" by McCarthy (2007) is one of these technological advancements, and it revolutionizes how languages are taught and learned. According to Akbarani (2024), AI tools are increasingly being integrated into language learning platforms, which enable enhanced learning experiences with the help of personalization according to learners' individual needs. Personalized learning can be referred as one of the most significant features of AI tools, which really affects the quality of the learning process (Wang, 2019). Apart from personalization, AI has positive effects on language learners' learning anxiety (Ma et al., 2022), motivation (Jeon, 2024), and language skills (Guo, Wang, and Cu, 2022). As proven by empirical studies, the use of AI technology has enormously increased, leading to more research studies on it.

Apart from empirical studies, several research have been conducted to systematically analyze the results of studies on AI in language education, and one of the very first studies is by Ji, Han, and Ko (2022). They examined empirical studies on AI-integrated language learning between 2015 and 2021. Their results showed the importance of AI integration into language learning, especially for decreasing the workload of teachers (Ji, Han, and Ko, 2022). Another systematic review was carried out by Labadze, Grigolia, and Machaidze (2023), which includes the studies on the use of AI chatbots in education. The study showed that AI integration is beneficial for educators in terms of time-saving and enhanced pedagogical skills, together with claiming the concerns on reliability, accuracy, and ethical considerations (Labadze, Grigolia, and Machaidze, 2023).

In addition to systematic analysis studies, bibliometric analysis was also carried out by scholars in recent years. One of the very first bibliometric studies on AI in language education was carried out by Liang et al. (2021), including the studies indexed in Web of Science between 1990 and 2020. It showed that previous studies focused on anxiety, willingness to communicate, learning and acquisition, and classroom interaction. Huang, Zou, Cheng, Chen, and Xie (2023) conducted a bibliometric analysis study to investigate the trends, problems in research, and uses of AI in language teaching. The findings demonstrated that the main uses of AI were to support speaking, listening, writing, reading, vocabulary, and grammar, while automatic speech recognition, learner profiling,

and natural language processing were frequently used to create intelligent tutoring, tailored learning, and automatic writing evaluation systems.

### *1.2. The aim of the study and research questions*

Focused on the increasing interest in AI in language education, researchers from all around the world have tried to investigate the various aspects of AI in language education. Previous studies mainly investigated the effects of AI and AI tools in language education, while some of them focused on systematic and bibliometric studies. As an evolving and constantly changing technology, there is an enormous increase in the studies on AI and the results of previous studies on AI may be outdated even within a short time. Therefore, the present paper tries to explore the current global trends in the studies on AI, published in highly reputable journals indexed in the Web of Science (WOS) database, and to find out the potential gaps for further studies. This paper holds a significance in terms of adding new studies and only including high-reputable journals indexed studies, in addition to discovering potential research gaps for further studies. Collecting all these research studies in a single study can provide the opportunity to identify how language education is evolving in response to AI advancements, helping educators and researchers stay current with the latest pedagogical approaches. The present study opens the way for more focused research and policy development, and it gives potential research ideas for further studies. This study seeks answer to the following questions to find out the potential gaps:

1. What is the distribution of studies on AI in language education over the years?
2. Which countries have the most published studies on AI in language education?
3. How is the distribution of topics in the studies on AI in language education?
4. What are the keywords of the studies on AI in language education?
5. What are the main findings of the studies on AI in language education?
6. What are the most cited 10 studies on AI in language education?

## 2. Method

### *2.1. Research design*

As this study aims to uncover emerging global trends in the published articles (Donthu, et al. 2021) on AI and language learning, it follows a descriptive bibliometric analysis, which is a method used to quantitatively assess the features and trends within a specific body of literature (van Leeuwen, 2004). This type of bibliometric analysis concentrates on summarizing and describing key characteristics of publications without exploring the relationship between them. Additionally, it includes a systematic review

part that focuses on the abstracts of publications to find out the target populations and main findings of the published studies.

### *2.2. Included studies and analysis*

The data pool of the present study consists of the research articles indexed in the Web of Science (WOS) database, which is a highly reputable index accepted all around the world. Keywords used for the search were "Artificial Intelligence", "English Language", "Teaching", and "Learning", and review articles were excluded. Only the studies published in the English language were included and the research areas were limited to education, educational research, and linguistics.

In total, 66 studies were added to the data pool for analysis. All the data were downloaded from WOS as an Excel spreadsheet and followed a manual review. First, the studies in the pool were analyzed manually to find out the distribution of studies over the years, the countries with the most publications, the distribution of investigated topics, the distribution of studies on language skills, the distribution of studies with Chatbots, and keywords, as a part of descriptive bibliometric analysis. Then in order to explore the target population and main findings, abstracts of publications were reviewed, read verbatim and codes were created as a part of systemic analysis. The most cited 10 studies and the most published five journals were identified manually on Excel spreadsheet by ordering and counting.

## 3. Results and Discussion

The results showed that the first study about AI and language education was published in 1997, followed by 2009, 2010, 2017, and 2018, with one research for each. However, after 2020, the number of publications was increased. Figure 1 shows the distribution of studies over the years. It can be clearly observed that the number of publications after 2022 was highly many. The reason for this sudden rise is mostly related to the launch of ChatGPT, which is an AI-enhanced chatbot developed by the OpenAI team. That platform gained lots of members in just a short time, and most people tried to use it, including educational members and institutions.

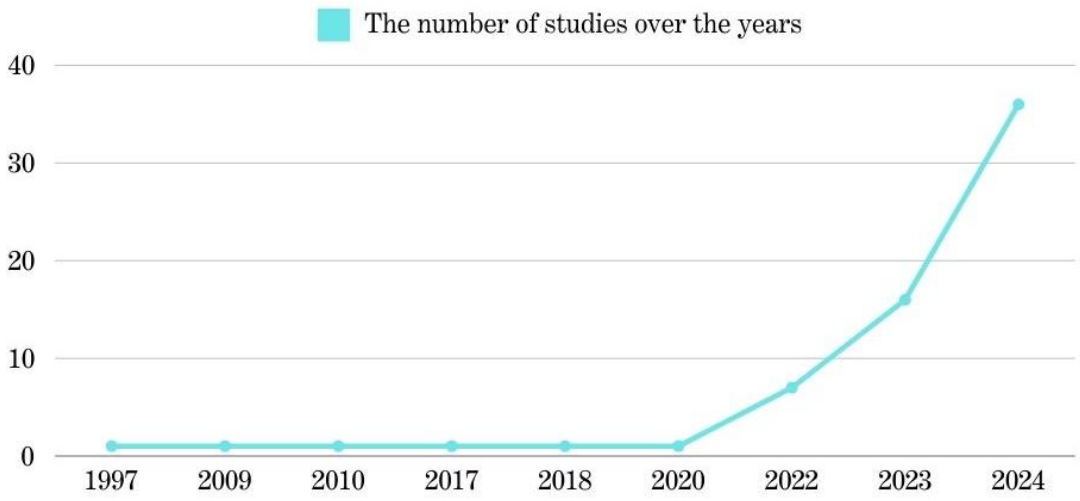


Figure 1. Distribution of studies over the years

In order to find out which countries focused on AI in English language education; the affiliations of the publications were reviewed. When the distribution of studies by country was examined, it was seen that the most publications were made in China, with the number of 14. Iran, the U.S.A., and Türkiye are among the countries with the most publications after China, with four studies each. Figure 2 demonstrates the distribution of studies by country. Similar results were also observed in the study by Jaleniauskiene, Lisaite and Daniusevičiūtė-Brazaitė (2023). The reason why China comes first may be related to the crowded population of that country.

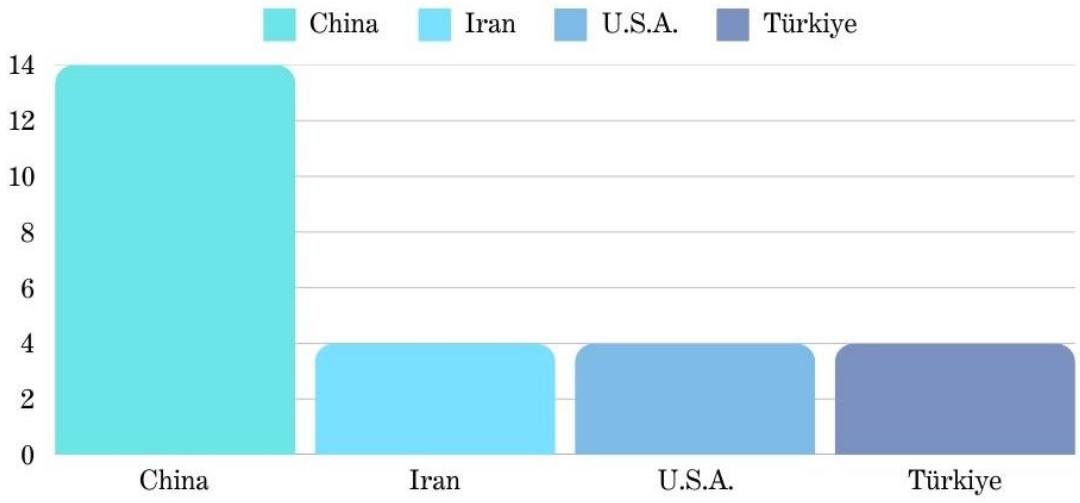


Figure 1. Distribution of studies by countries

One of the most important parts of the present study is to find out the most studied topics in articles. The analysis showed that researchers mostly focused on language skills, followed by teaching in general, teachers' perspectives, and other topics, as shown in Figure 3. It might be observed that there were studies to develop and analyze some AI systems for language education. The current gap here was the investigation of learners' perspectives. Because learners are the key elements of a learning process, much more studies should focus on their perspectives as well. As language educators and researchers, the focus of further studies might be the learners, and so far, studies on AI have not paid much attention to this part.

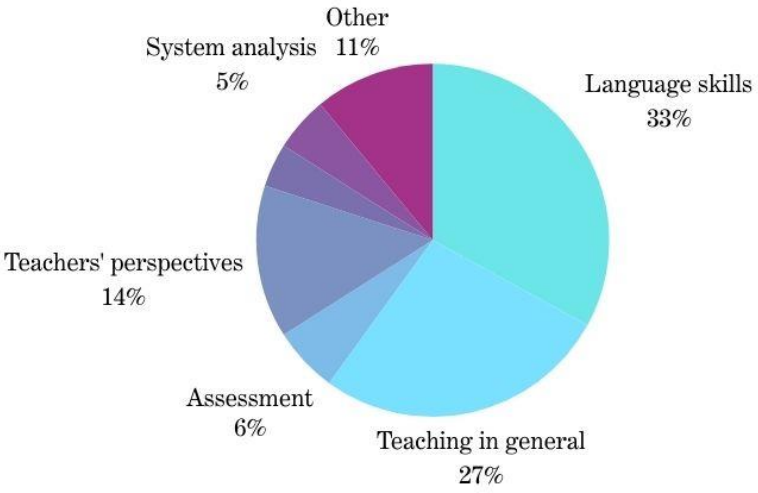


Figure 3. Distribution of topics

For a deeper analysis, the studies on language skills were also reviewed in detail, which can be seen in Figure 4. The results showed that the most studied language skills were speaking and writing, which are regarded as productive skills. However, the least studied skills were vocabulary and listening, as they were not ready to investigate by implementing AI tools. Therefore, it might be claimed that the research trends are focused on productive skills, and there is a current research gap on receptive language skills. Additionally, Chatbots, namely ChatGPT are among the most used AI platforms that provide lots of opportunities for language learners mostly with writing. On the other hand, other platforms also provide opportunities for language learners to practice speaking skills.

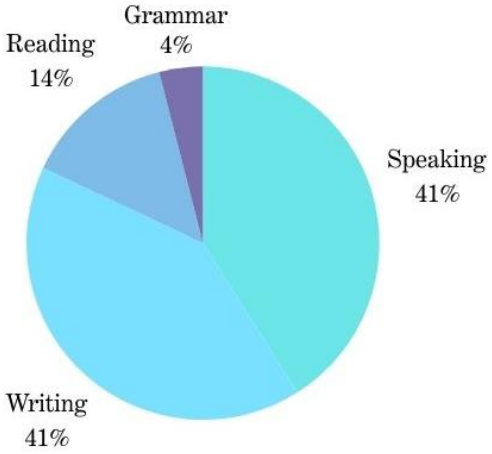


Figure 4. Distribution of studies on language skills

As with the launch of ChatGPT, the number of studies on chatbots has changed over the years, as can be seen in Figure 5. Before 2022, there was only one study focused on using chatbots, while after 2023 it increased, and in 2024, the number was 17. When the total number of studies and the studies on chatbots were analyzed, it can be clearly observed that while almost none of the studies before 2022 were about chatbots, almost half of the studies published in 2024 focused on the use of chatbots. This explains the popularity of chatbots, namely ChatGPT, integration, and investigation trends in the field of English language education.

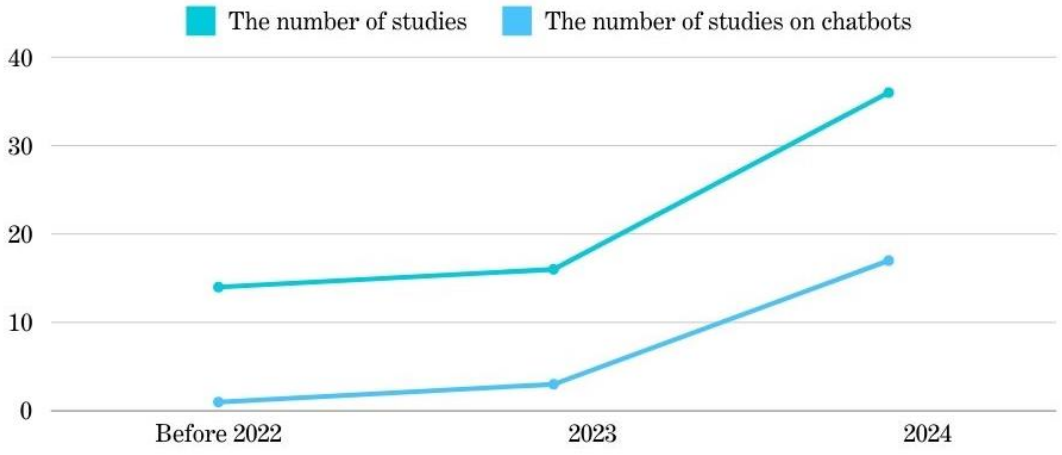


Figure 5. Distribution of studies on chatbots

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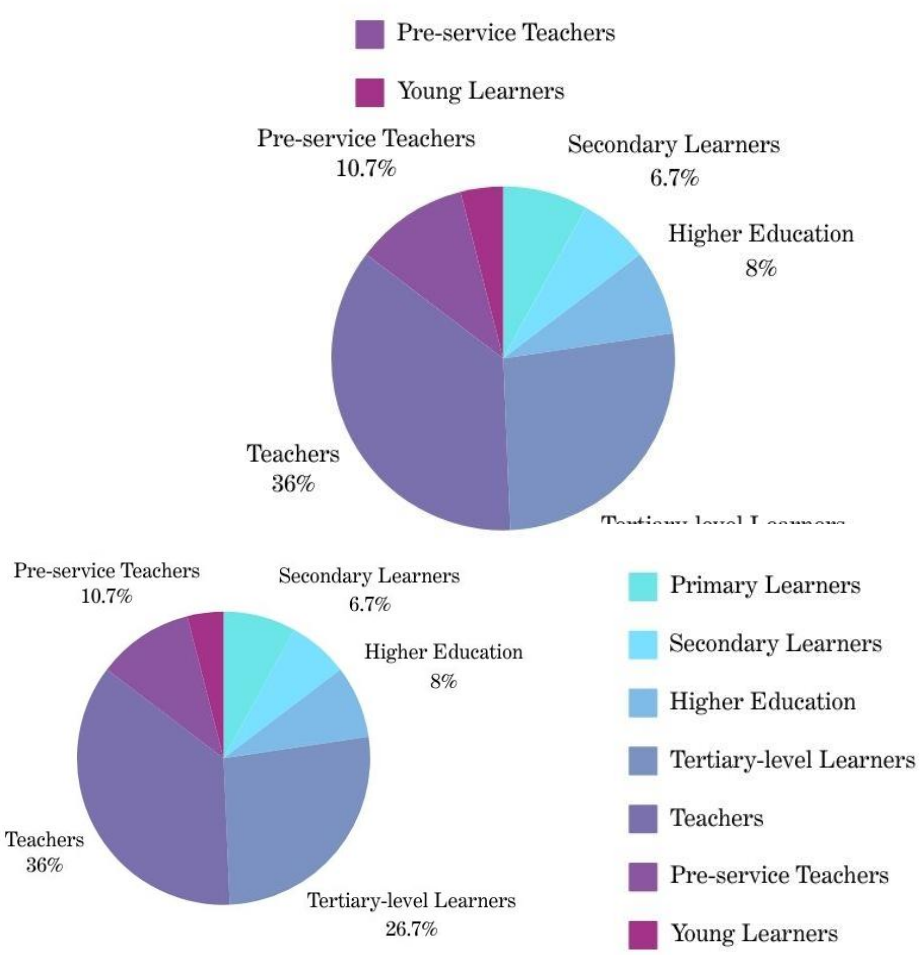


Figure 6. Target populations of studies

As the keywords of studies reflect the current trends and focused areas in the field, the keywords were also analyzed to see the most used ones. Keywords used in the studies were shown in Figure 7, and visualized by a word cloud generator program, as shown in Figure 8. The word cloud clearly shows that the studies were on artificial intelligence, language learning, English teaching, ChatGPT, writing, education, etc. It is not surprising that the most frequent keywords are artificial intelligence and ChatGPT, as discussed above. On the other hand, it is observed that there are no keywords related to other language skills, such as speaking or listening, which shows a research gap here. For further studies, the keywords should be taken into consideration to diversify those keywords. Based on the previous discussion and the author keywords presented here, further studies might engage with learners' perspectives, guidelines, frameworks, various language skills, grammar teaching, vocabulary teaching, material developments, material evaluations, etc.

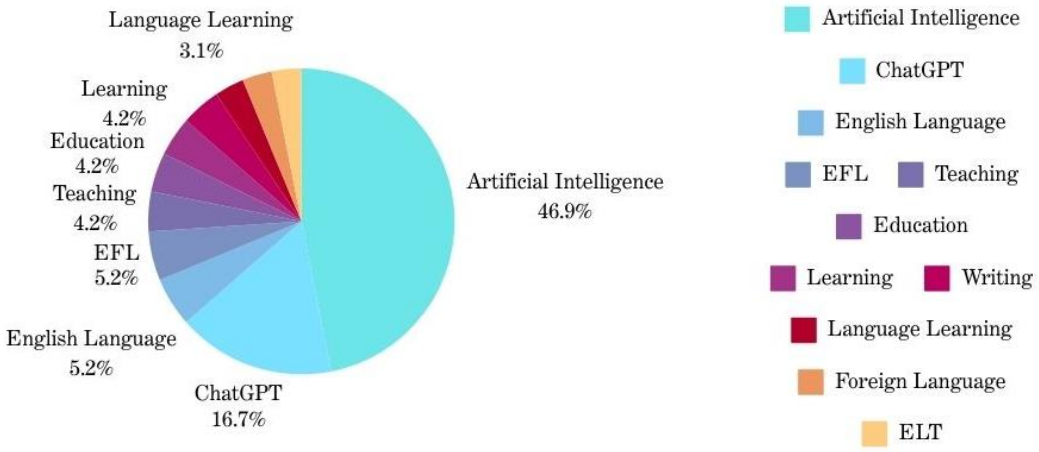


Figure 7. Distribution of author keywords

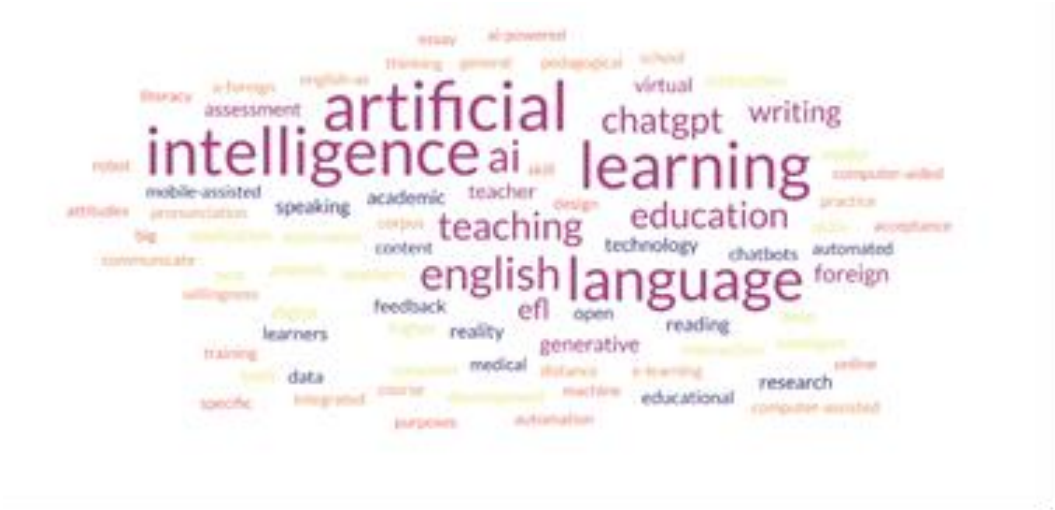


Figure 8. Word cloud of keywords

The abstracts of the studies in the data set were also analyzed by following content analysis, and three main findings from the studies, reflecting key themes in AI and technology use in English language education were summarized below.

1. Opportunities and challenges of AI integration into language education: The studies in data set suggest that AI plays a significant role in revolutionizing language education through engagement, personalized learning, and innovative pedagogical approaches, as reported by Zhu (2020) as well. On the other hand, they report that AI also poses some challenges including ethical transparency, the reliability of AI-generated content, and its potential to hinder the development of critical thinking skills. Studies

claim that with ongoing technological developments, these challenges are being addressed, and AI is increasingly viewed as a valuable tool to improve both students' language proficiency and teachers' instructional methods.

2. Potential human-AI collaboration in language teaching: The studies report that AI is not a replacement, but rather a complement to teachers in language education. The role of teachers in language education is mostly facilitator, and this role remains irreplaceable, guiding students in using AI tools effectively and fostering critical thinking. Cope, Kalantzis and Searsmith (2020) report that AI has the potential to transform education, making the AI in education more human, but it will never replace teachers due to its different nature from human intelligence. Grounded on this, some studies report that human-AI co-creating in the classroom is important, and in this case, language educators and AI collaborate to maximize teaching outcomes through personalized learning paths, error identification, and instant feedback. They also emphasize the significance of teaching in setting ethical guidelines and preventing issues like cheating and plagiarism. A similar implication was given by Bozkurt et al. (2021) that ethical frameworks remain an understudied area in the field of education.

3. AI combination with VR as enhancers of language learning: Many studies focus on the role of AI and VR in improving the language learning process. Some studies emphasize that VR's immersive environment combined with AI can address shortcomings of traditional language classes (Li, Xie and Liu, 2020; Chen, et al. 2022; De La Vall & Araya, 2023), and AI tools like ChatGPT offer personalized feedback, enhance writing, and vocabulary acquisition, and provide conversational practice (Xiao and Zhi, 2023; Punar Özçelik and Yangın Ekşi, 2024). Automated assessments and AI-based platforms help students boost their self-regulation, self-efficacy, and cognitive presence, which results in improved outcomes in language learning and public speaking proficiency.

The 10 most cited studies were also analyzed to see the most read articles in the field. The results are summarized in Table 1. They were ordered according to the number of cited times. The investigation demonstrated that the most cited first two studies were also about the use of ChatGPT, which proves the current trends of using chatbots.

Table 1. The most cited 10 studies

| Author | Year | Article Title | Cited Times | Journal |
|---|---|---|---|---|
| Jeon, J | 2024 | "Exploring AI chatbot affordances in the EFL classroom: young learners' experiences and perspectives" | 53 | Computer Assisted Language Learning |
| Mohamed, AM | 2024 | "Exploring the potential of an AI-based Chatbot (ChatGPT) in enhancing English as a Foreign Language (EFL) teaching: perceptions of EFL Faculty Members" | 37 | Education and Information Technologies |
| Li, XG | 2017 | "The Construction of Intelligent English Teaching Model Based on Artificial Intelligence" | 34 | International Journal of Emerging Technologies in Learning |
| Guo, K; Wang, J; Chu, SKW | 2022 | "Using chatbots to scaffold EFL students? argumentative writing" | 34 | Assessing Writing |
| Liu, CC; Hou, JR; Tu, YF; Wang, YM; Hwang, GJ | 2023 | "Incorporating a reflective thinking promoting mechanism into artificial intelligence-supported English writing environments" | 31 | Interactive Learning Environments |
| An, X; Chai, CS; Li, YS; Zhou, Y; Shen, X; Zheng, CP; Chen, MY | 2023 | "Modeling English teachers' behavioral intention to use artificial intelligence in middle schools" | 21 | Education and Information Technologies |
| Wang, XH; Pang, H; Wallace, MP; Wang, QY; Chen, WL | 2024 | "Learners' perceived AI presences in AI-supported language learning: a study of AI as a humanized agent from community of inquiry" | 20 | Computer Assisted Language Learning |
| Hockly, N | 2023 | "Artificial Intelligence in English Language Teaching: The Good, the Bad and the Ugly" | 15 | RELC Journal |
| Chen, YC | 2024 | "Effects of technology-enhanced language learning on reducing EFL learners' public speaking anxiety" | 14 | Computer Assisted Language Learning |
| Lee, JH; Shin, D; Noh, W | 2023 | "Artificial Intelligence-Based Content Generator Technology for Young English-as-a-Foreign-Language Learners' Reading Enjoyment" | 13 | RELC Journal |

Additionally, the five journals that had the most published research studies on AI and language education are shown in Table 2, with the impact factor of the journal and the number of publications in those journals related to the topic under investigation.

Table 2. The most five published journals

| Journal Title | Impact Factor | Publication Number |
|---|---|---|
| Education and Information Technologies | 4.8 (2023) | 9 |
| Computer Assisted Language Learning | 6.8 (2023) | 6 |
| Interactive Learning Environments | 4.5 (2023) | 5 |
| RELC Journal | 3.3 (2023) | 5 |
| Arab World English Journal | 0.7 | 4 |

## 4. Pedagogical Implications and Suggestions for Further Studies

The present bibliometric and systematic analysis study aimed to explore the current research trends on AI and language education all around the world. The data set included the studies published in reputable journals indexed in WOS. According to the results of the analysis, the following pedagogical implications are explained. First, the growth of studies after 2022 highlights an increasing interest in the integration of AI into language education. Language educators and researchers should remain informed about recent advances, particularly regarding AI tools like Chatbots and generative models, to enhance instructional strategies and learning experiences. Next, the emphasis of studies on mostly speaking and writing skills suggests a shift in pedagogical strategies, likely influenced by the conversational nature of many AI tools. Language educators might incorporate AI-enhanced tools, such as ChatGPT, to engage learners in interactive dialogues so that they could improve their speaking and writing proficiencies in real time. Third, listening and vocabulary have been studied less, and this limited focus on these skills signals potential areas for pedagogical innovation. Integrating AI tools that focus on aural comprehension and lexical development might lead to more balanced language skill acquisition. There are some AI-based adaptive listening platforms or vocabulary-building applications in this aspect. The other one is that with fewer studies focusing on learner perspectives and assessment, there is a need for language educators to design AI-integrated classrooms that prioritize student feedback and personalized assessments. Taking advantage of AI for formative assessment may provide more timely and individualized feedback for students, accommodating their learning needs. Finally, the studies are mostly conducted in China, and this dominance suggests the importance of a regional perspective on AI in education. Language educators from all around the world should consider global best practices more, yet adapt AI implementations to fit local linguistic, cultural, and pedagogical contexts.

For further studies, more studies may delve into areas such as AI systems analysis for language education, learner perspectives, and assessment. Examining how AI can support assessment processes, enhance personalized learning, and improve students' metacognitive skills could fill a critical gap in the current literature. More studies are needed on listening and vocabulary skills to create a comprehensive

framework for integrating AI into all aspects of language education. Further studies could explore how AI-based tools for automated speech recognition, voice-to-text applications, and vocabulary acquisition systems affect learners. As it is clear from current trends, chatbots, especially ChatGPT, have been heavily researched for language production skills. For further studies, an investigation of their effectiveness in teaching comprehension-based skills like reading and listening might be conducted. Additionally, more cross-cultural comparative research studies can be carried out to offer insights into how AI tools perform in different educational environments, with different instructional methods and student populations.

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