Empirical Research Trends in the Use of AI Chatbots in EFL Teaching and Learning in Vietnam: A Systematic Review

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ABSTRACT

Since the creation of ELIZA in 1966 and the groundbreaking launch of ChatGPT in 2022, AI chatbots have advanced and found applications across various fields, including English language education, prompting numerous studies. This paper presents the first systematic review of empirical studies concerning AI chatbots in EFL teaching and learning within Vietnam, adopting the PRISMA flowchart model (Moher et al., 2009) for article selection, and thematic analysis for data analysis. Findings reveal that, although limited, the number of empirical studies on AI chatbots in English education in Vietnam has been growing, with around a quarter published in Scopus-indexed journals or book series. Research settings varied, with Ho Chi Minh City being the most common location. ChatGPT was the dominant AI chatbot, and AI chatbots' influence on students' English learning was the most explored topic. Undergraduates and university lecturers were the primary participants, and the mixed-method approach, particularly using questionnaires with or without interviews, was the most commonly employed methodology.

Keywords: Empirical research trends, AI Chatbots in EFL classrooms, Vietnam, systematic review

Introduction

Artificial intelligence (AI) and its application have been a popular topic of discussion across a range of disciplines including education. Studies have demonstrated that AI and AI chatbots in particular have become a powerful asset in the realm of English language instruction and acquisition, offering a variety of benefits to both students and educators. A meta-analysis indicated that utilizing AI chatbots can facilitate improved educational results by offering interactive and personalized learning experiences (Wu & Yu, 2023). The personalized nature of chatbot interactions allows for tailored guidance and support, which is essential for language acquisition (Baskara, 2023). For instance, the incorporation of chatbots in education has yielded

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encouraging results in improving students' English-speaking skills, self-assurance, participation, and motivation (Du & Daniel, 2024). In line with this, students using AI chatbots demonstrated significantly improved speaking skills compared to those who did not (Kemelbekova et al., 2024). This is consistent with the findings of Han's research revealing that AI chatbots not only enhance speaking competence but also positively influence students' emotional responses to learning (Han, 2020). Liu et al. (2024) also confirmed that engaging with chatbots can cultivate a sense of flow and heighten students' engagement with reading activities.

Several systematic reviews of research on AI chatbots in the educational sector, particularly English language teaching and acquisition, have been conducted. One example is the research with the inclusion of 53 articles implemented by Okonkwo and Ade-Ibijola (2021) with the aim to construct a comprehensive understanding of chatbots in education, covering their applications, advantages, drawbacks and potential directions for future research on integrating chatbot technology into educational settings. A considerable number of other papers also centered on the topic of conversational AI's impact on education (Chen et al., 2020; Crompton & Burke, 2023; Deng & Yu, 2023; Gökçearslan et al., 2024; Krstić et al., 2022; Pérez et al., 2020; Tahiru, 2021). Similarly, Huang et al. (2021) analyzed a dataset of 25 articles to investigate the possible benefits of AI chatbots in the area of language education. Concentrating on a different aspect, Ji et al. (2022) reviewed empirical data on human-computer collaboration across 24 studies carried out in language learning environments powered by conversational AI and published between 2015 and 2021. One of the most recent publications examined 32 papers to figure out trends in conversational AI tools for English Language Teaching (ELT) from January 2013 to November 2023, focusing on publication patterns, tool categories, research methodologies, educational results, and the variables that affect their implementation (Lai & Lee, 2024). Although these papers explored numerous studies from various countries, there is a scarcity of reviewed studies conducted in Vietnam. This, therefore, will be the first to concentrate exclusively on research conducted within the country, providing valuable insights into recent publication trends, frequently and scarcely investigated topics, commonly applied research approaches and instruments and typical research participants in empirical research on AI chatbots in English education. The findings will benefit researchers, educators, and other stakeholders working in Vietnam, guiding future studies on the same topic.

Literature review

Artificial intelligence chatbots

Artificial intelligence (AI) chatbots, as described by Haristiani (2019), are AI-powered applications that can engage in textual or vocal interactions with users and have the ability to expand their knowledge. These conversational tools rely on sophisticated AI technologies, including large language models, natural language processing, and machine learning, to process user input and respond in a conversational style using text or speech (Lai & Lee, 2024). The history of AI chatbots began with the invention of ELIZA by Weizenbaum in 1966, preceding the introduction of PARRY in 1972, Jabberwacky in 1988, ALICE in 1995 while the early twenty-first-century chatbots include SmarterChild, Apple Siri, IBM Watson, Google Assistant,

Microsoft Cortana, which were developed in 2001, 2010, 2011, 2014 respectively (Adamopoulou & Moussiades, 2020). The emergence of ChatGPT in 2022 marked a turning point for AI chatbots, catapulting them to widespread popularity after years of development, and sparking a boom in the creation of new Chatbots, with Gemini, Microsoft Copilot, and Perplexity being notable examples.

Table 1 demonstrates categories of AI chatbots according to knowledge domains, the kinds of service provided, goals, response generation methods, the requirement of human intervention, permissions provided by the development platforms and communication channels. A chatbot is not limited to only one category but can be classified in multiple ways (Adamopoulou & Moussiades, 2020).

Table 1

Classifications of AI chatbots

Knowledge domain	*Generic* (responding to any query from any subject area)
	Open Domain (functioning across various fields)
	Closed Domain (being limited to a specific area of knowledge)
Service provided	*Interpersonal* (assisting with reservations in restaurants or airlines, or searching for answers in FAQs, without providing a friendly and conversational experience)
	Intrapersonal (being intimate companions who inhabit the user's realm and comprehend their needs)
	Inter-agent (interacting with other chatbots)
Goals	*Informative* (sharing data stored in a fixed repository)
	Chat-based/conversational (interacting with the user in a natural, human-like way)
	Task-based (performing various tasks such as booking rooms)
Response generation method	*Rule-based* (identifying a pattern in the user's input and providing a corresponding pre-determined response)
	Retrieval-based (determining the best response by reviewing the available resources)
	Generative (providing a human-like response that considers both the current and previous inputs)
Human intervention requirement	*Human-mediated*
	Autonomous
Access permission	*Open-source*
	Commercial
Communication channel	*Text*
	Voice
	Image

Note. Adapted from "Chatbots: History, technology, and applications", by E. Adamopoulou and L. Moussiades, 2020, *Machine Learning with Applications, 2* (https://doi.org/10.1016/j.mlwa.2020.100006). Copyright 2022 by Elsevier Ltd.

English teaching and learning in Vietnam

English is a core component of the Vietnamese national curriculum, and as a mandatory subject, English is integrated into all educational tiers, from primary school to university, equipping students with the linguistic competencies essential for thriving in the interconnected global landscape. The Vietnamese government views English as a vital asset for national development, modernization, and global competition while at the individual level, many Vietnamese people perceive English proficiency as a key to unlocking various opportunities (Hoang, 2020).

In recent years, English teaching and learning in Vietnam has undergone significant transformations, particularly after the COVID-19 pandemic, with increased attention to online learning and technology integration, which reflects a mix of traditional and modern approaches, with efforts to improve English proficiency among Vietnamese students (Dinh et al., 2024; Hoang & Le, 2021). Technology has significantly advanced English language teaching and learning in Vietnam. Universities have adopted e-learning platforms such as LMS and Canvas, offering flexible and efficient learning experiences (Cam, 2021). Blended learning models, combining in-person and online instruction, are being explored to amplify student involvement and achievements (Dinh et al., 2024). English majors have shown positive attitudes toward incorporating AI instruments into their linguistic acquisition endeavors, recognizing their potential to improve learning outcomes (Nguyen, 2024).

AI chatbots in English teaching and learning in Vietnam

AI-powered chatbots are transforming English education in Vietnam, providing students with personalized and engaging learning experiences. AI chatbots are claimed to help improve students' speaking accuracy and fluency as they can speak using better hedging words, grammar structures and lexical resources (Duong & Suppasetseree, 2024). In the same area of speaking, AI chatbots can enhance students' pronunciation skills in areas such as stress, intonation, and vowel sounds (Hoang et al., 2023; Ho et al., 2024). Besides, ChatGPT, a popular AI chatbot, is recognized as a valuable resource for ESP learners, assisting with vocabulary acquisition, translation, grammar checking, and paraphrasing (Ho, 2024). Other studies have found positive influence of AI chatbots on boosting students' learning motivation as the learning stress is lowered, and promoting students' creativity and autonomy (Pham & Le, 2024). These findings corroborate Pham's (2024) research, which identifies ChatGPT as an effective language tool that fosters deeper understanding of the subject matter, elevates student involvement, and reinforce self-assurance, making it well-suited for project development and creative thinking.

Despite the benefits offered by AI chatbots, research in the context of Vietnam has also found their possible adverse effects or challenges. It is feared that AI chatbots may cause students' overreliance on them, diminishing their creative thinking, critical thinking and problem-solving skills (Ngo et al., 2024). The concern about academic integrity is also raised since AI chatbots can be used for plagiarism (Ngo et al., 2024; Nguyen, 2023).

Although AI chatbots present promising advantages for English language teaching, their implementation in Vietnam must be approached with prudence. Further research on this topic is crucial; as a result, an examination of existing studies on the application of AI chatbots in English language education is necessary to guide future research efforts.

Research Questions

This systematic review aims to address the following research questions.

1. What are the publication trends by year, journal/book series, and location in empirical studies examining the use of AI chatbots for English language learning and teaching in Vietnam?
2. What are the topics of empirical studies examining the use of AI chatbots for English language learning and teaching in Vietnam?
3. What kinds of research methods, participants, and data gathering instruments are used in empirical studies examining the use of AI chatbots for English language learning and teaching in Vietnam?

Methods

Design of the Study

This paper utilizes a systematic review method to analyze articles and address its research inquiries. Systematic reviews are rigorous, structured approaches to literature review (Turnbull et al., 2023). They offer comprehensive, unbiased summaries of research, focusing on specific questions. Using explicit search strategies, they include relevant studies from diverse sources, applying predefined criteria for selection to ensure objectivity. Studies are critically evaluated using standardized methods to assess their quality and relevance. Findings are often quantitatively synthesized, such as through meta-analysis, to provide a comprehensive overview. This process yields evidence-based conclusions that can inform decision-making and advance knowledge in various fields.

Table 2

Inclusion and exclusion criteria

	Inclusion	Exclusion
Subject area	AI chatbots in English language education in Vietnam AI in English language education in Vietnam with AI chatbots being specifically mentioned	Not AI chatbots in English language education in Vietnam AI in English language education in Vietnam without AI chatbots being specifically mentioned
Research approach	Empirical research	Conceptual research/literature review
Source	Peer-reviewed journals, conference proceedings, book chapters	Predatory journals, conference proceedings of predatory conferences
Language	English	Other languages
Accessibility	Accessible	Inaccessible

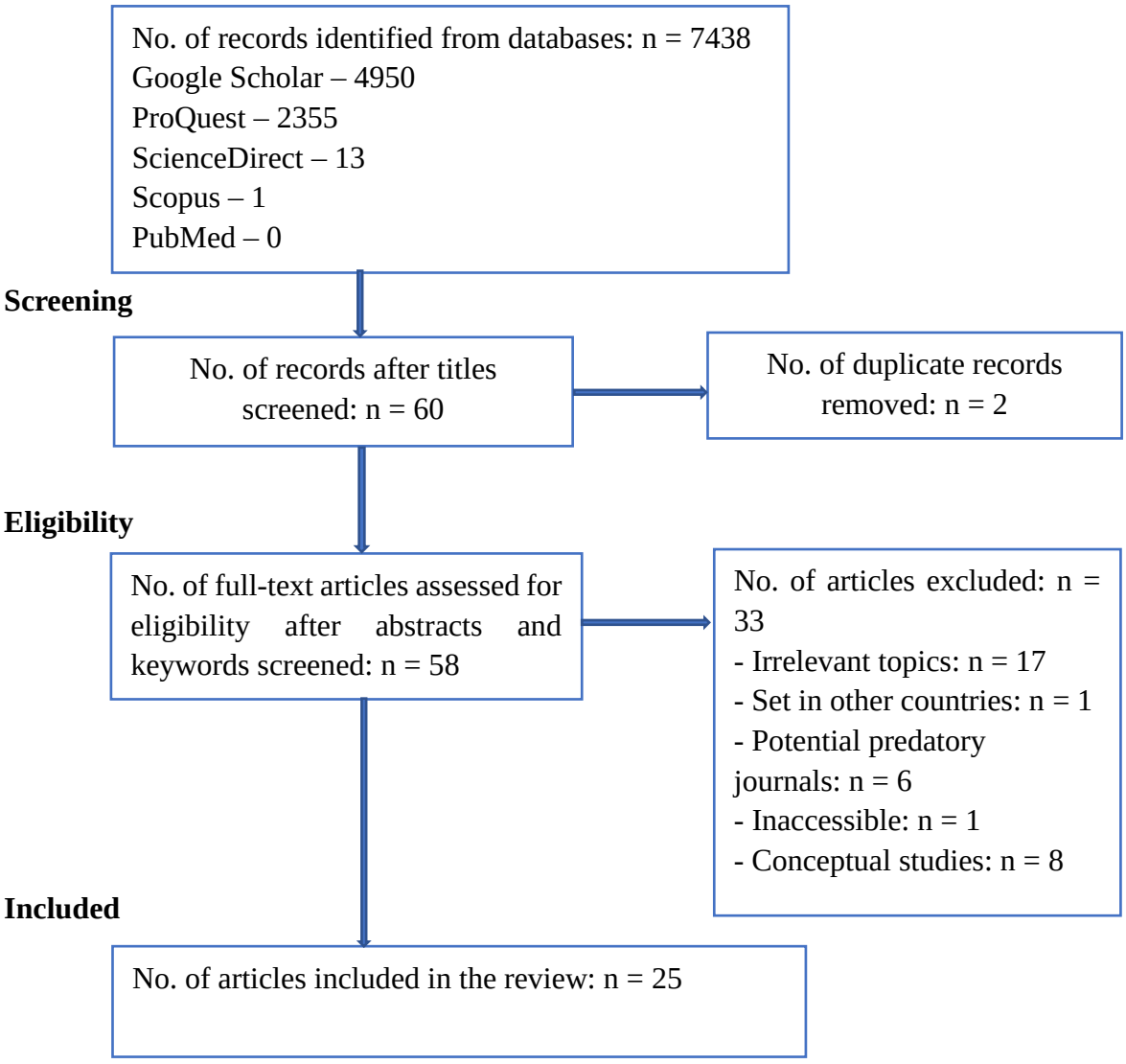
Data collection & analysis

The pertinent literature was sourced from the five different scholarly repositories: Google Scholar, ProQuest, Scopus, ScienceDirect, and PubMed. The search string was formulated using Boolean operators and had the following structure: "AI chatbots" AND "English teaching and learning" AND "Vietnam". An adaptation of the PRISMA flowchart model (Moher et al., 2009) guided the choice of relevant articles. The process included four steps: identification of potentially relevant articles through database searches, screening of articles' titles, abstracts, and keywords, assessment of full texts' eligibility against predetermined inclusion and exclusion criteria, and inclusion of chosen articles for analysis. The initial search results from all five databases totaled 7438 papers.

After that, the titles of the articles were screened using search filters, which were inclusion and exclusion criteria. This created a shortlist of 60 articles. Two duplicate articles were removed before the full texts of 58 articles were reviewed for eligibility, and the final list of articles was determined. The complete article selection procedure is detailed in Figure 1.

Figure 1

Breakdown of article identification and selection

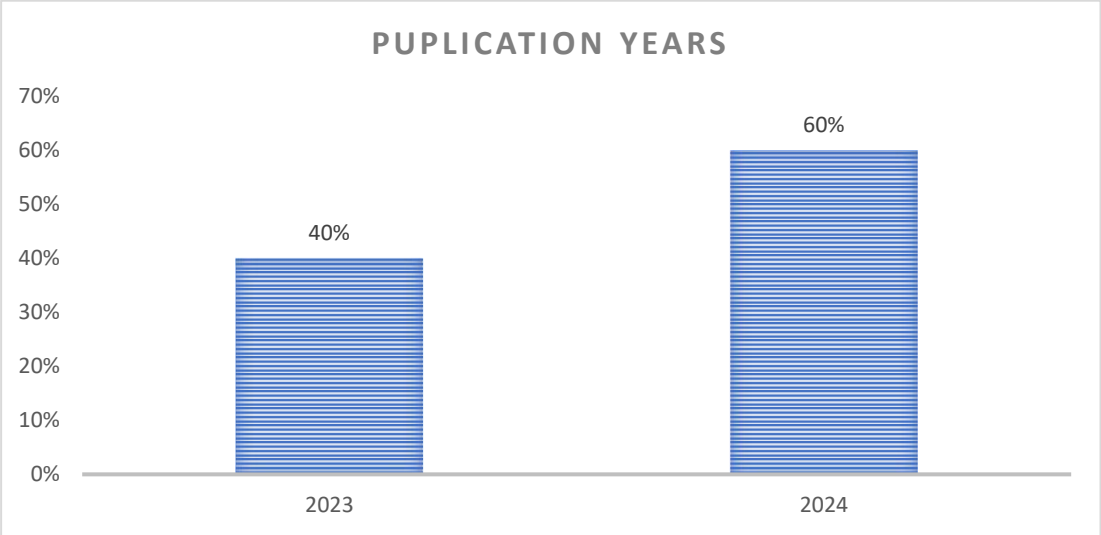


Results/Findings and discussion

Publication trends by year, journal/book series, and location

Figure 2

Publication trends by year

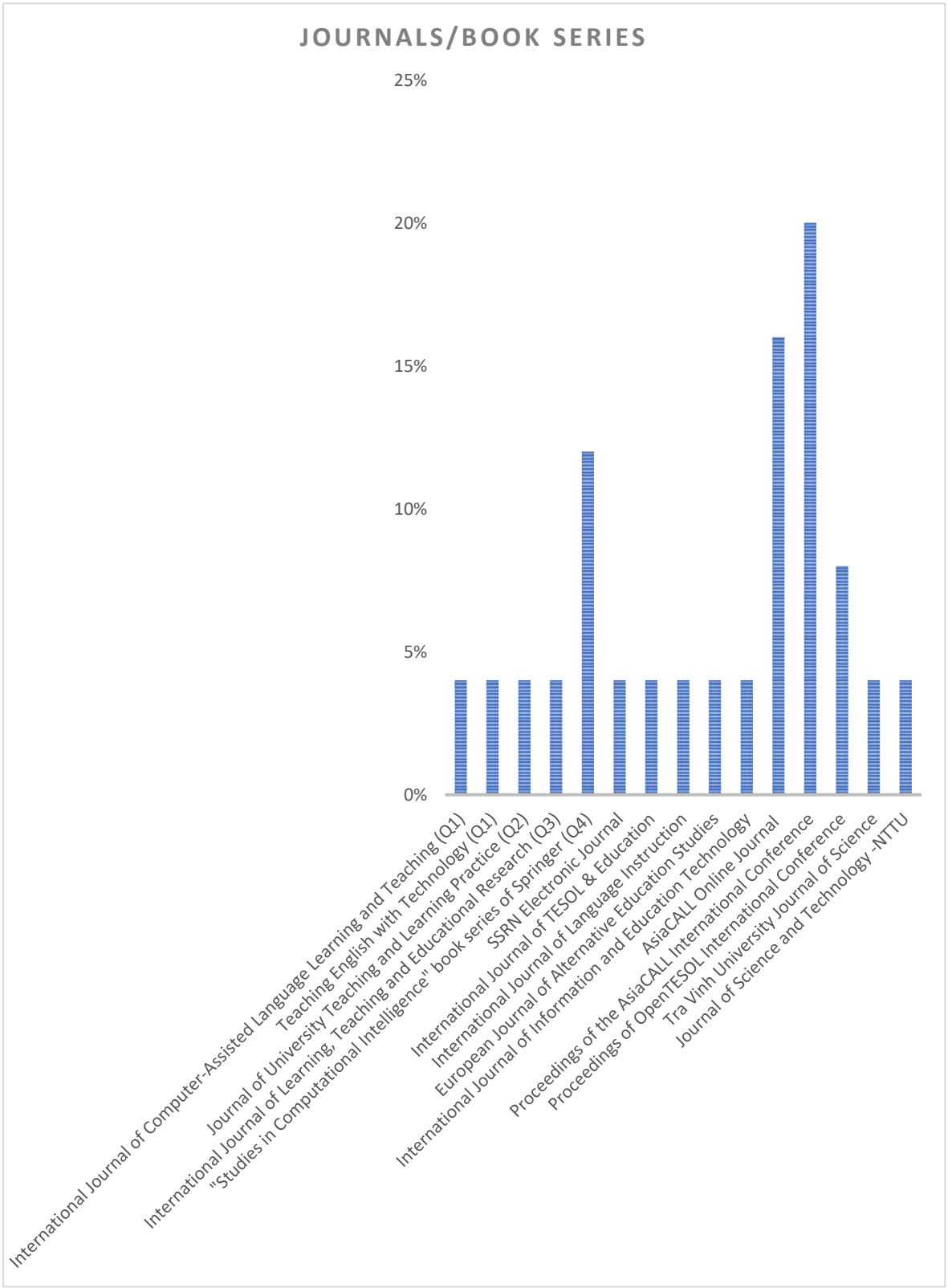


As shown by the chart, no research on AI chatbots in English language education were conducted in Vietnam prior to 2023, which indicates a recent surge in interests in researching the topic. Among 25 studies featured in the current review, 10 (40%) were published in 2023, and the figure rose significantly to 15 (60% of the total) in 2024. The figure may continue to rise towards the end of the year. This is in line with the findings of Lai and Lee (2024) confirming an increase in the number of studies on AI Chatbots in English language teaching and learning and those of Sharadgah and Sa'di (2022) reporting an upward trend in research on AI in English language education and acquisition. A systematic review by Xu et al. (2024) also confirmed this finding. Given the growing popularity of AI chatbots across various aspects of education, this increase is understandable.

As regards journals of publication illustrated by Figure 3, 24% of available articles were published in Scopus-indexed journals or book series, with two Q1 journals, one Q2 journal, one Q3 journal and one Q4 book series. The highest figures were for the Proceedings of AsiaCALL International Conference and AsiaCALL Online Journal. Up to 20% of the reviewed articles were published in the Proceedings of AsiaCALL International Conference while the percentage of articles published in Asia Online Journal was 4% lower. Two articles (8%) were published as part of the Proceedings of OpenTESOL International Conference. SSRN Electronic Journal, International Journal of TESOL & Education, International Journal of Language Instruction, European Journal of Alternative Education Studies, International Journal of Information and Education Technology, Tra Vinh University Journal of Science and Journal of Science and Technology-NTTU each accounted for one article published.

Figure 3

Publication trends by journal/book series

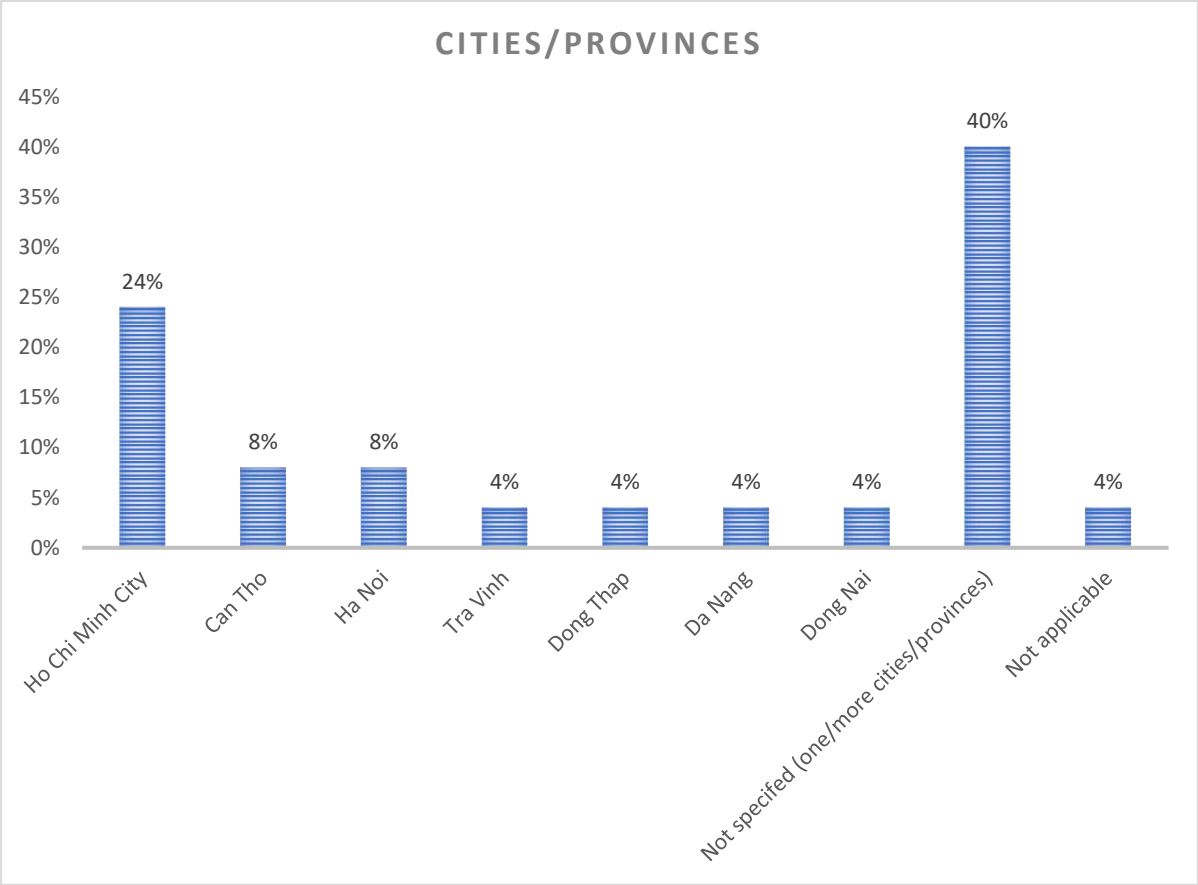


As for locations where the studies were set, the locations of a large proportion of studies (40%)

were not specified. Those studies were conducted with participants from one or more cities or provinces. The most popular location was Ho Chi Minh City, where 24% of studies took place. Can Tho and Ha Noi were considerably less prevalent; each accounted for only 8% of the studies. Tra Vinh, Dong Thap, Da Nang, and Dong Nai were the cities where other studies were conducted, with each study being set in one city/province. One study analyzed AI's answers to specific prompts, so the element of location is not applicable. These findings highlight a scarcity of research in numerous other cities and provinces across Vietnam.

Figure 4

Publication trends by city/province



Publication trends by topics

Figure 5 shows the dominance of ChatGPT as the center of up to 68% of the reviewed studies. A modest percentage (12%) of the papers focused on AI chatbots or AI in general with specific mentions of AI chatbots. Other AI chatbots were Andy, MissionFluent, Poe, VoiceGPT and ELSA, each of which was examined by one study. This conflicts with the conclusions drawn by Lai and Lee (2024) in their systematic review of international studies focused on conversational AI tools for English language teaching and learning and those drawn by Xu et al. (2024) in their in-depth analysis of research on employing chatbots to enhance EFL teaching in K-12 and higher education contexts from 2010 to 2023. As reported by these reviews, Google Assistant was the most prominent chatbot among the studies while ChatGPT was less prevalent.

Whether being the most frequently investigated chatbot or not, ChatGPT has undoubtedly emerged as one of the most popular tools in English language education, which is unsurprising considering the fact that its launch in 2022 created a global sensation, significantly increasing attention on AI chatbots overall.

Figure 5

Publication trends by AI chatbot

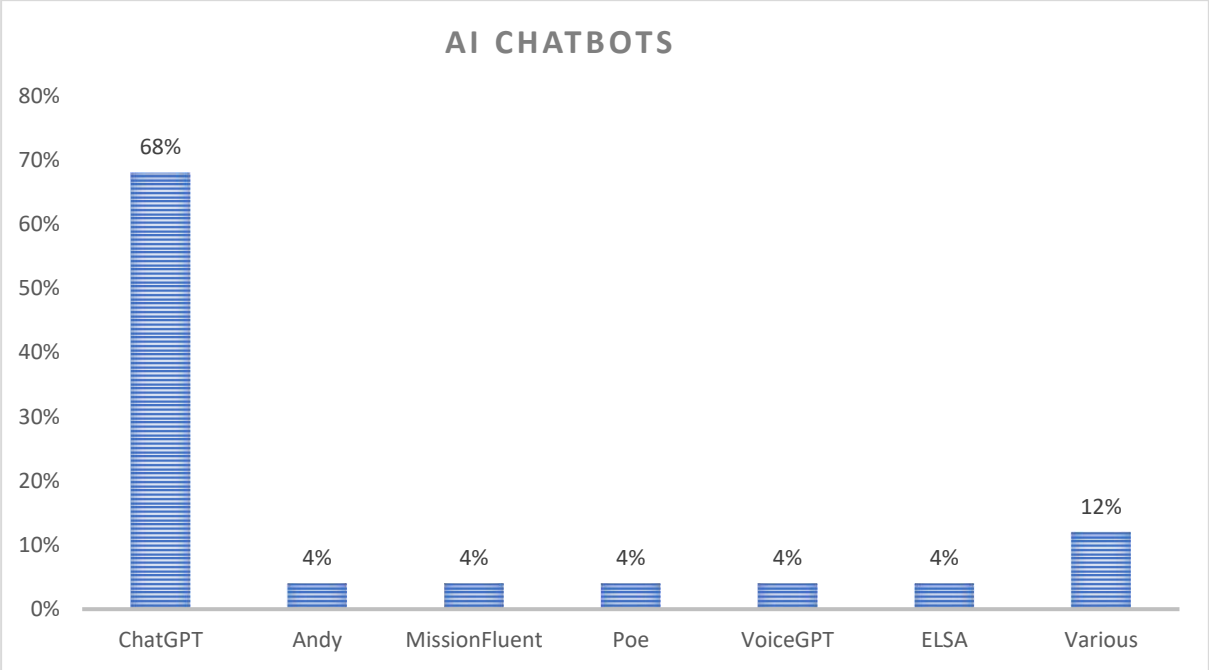
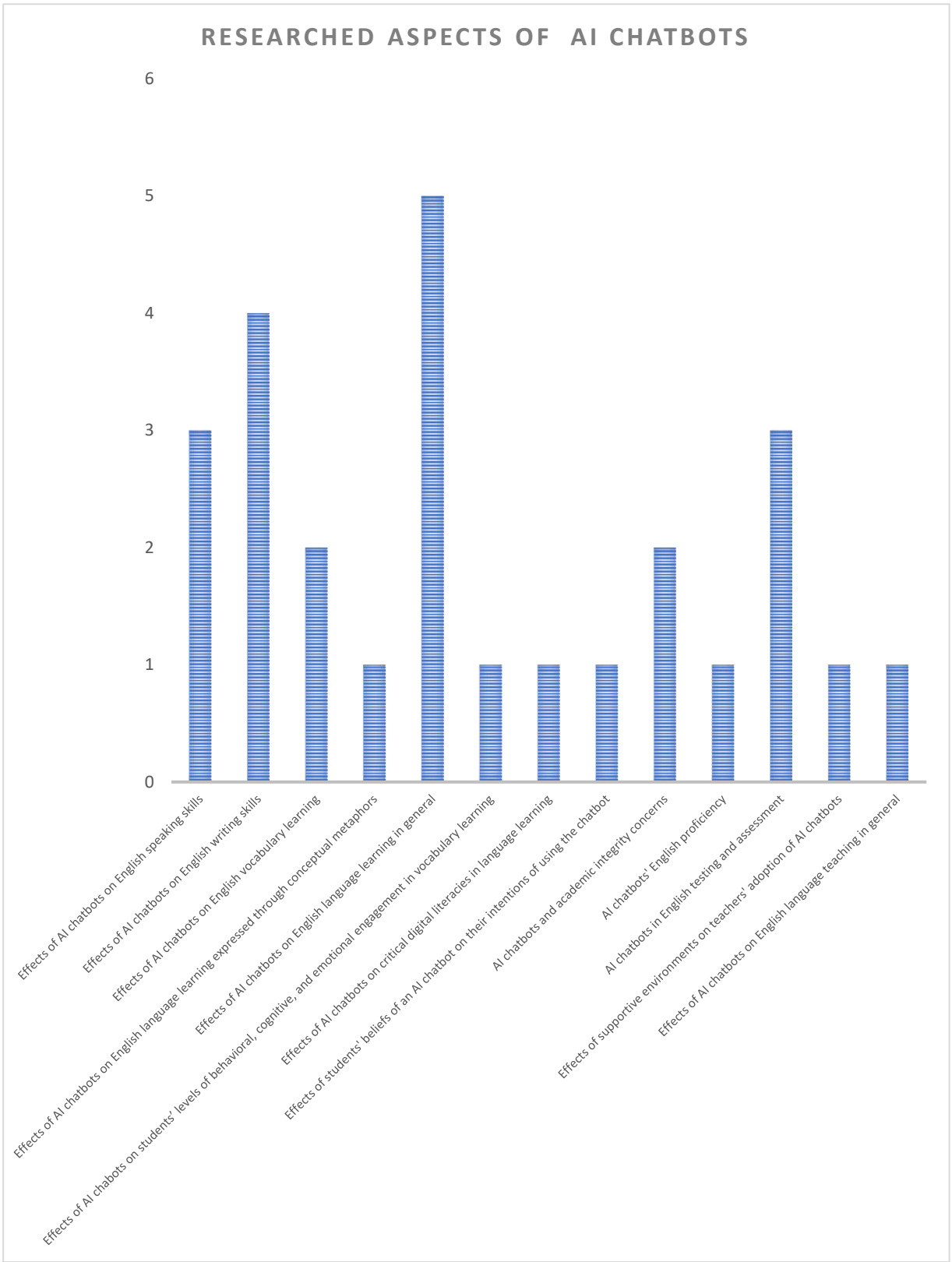


Figure 6 reveals that most of the available studies concentrated on the impacts of one or more AI chatbots on students' English learning in general or some particular aspects of English language learning such as speaking skills (overall speaking skills and pronunciation), writing skills (paragraph and essay writing), and vocabulary learning. The total figure for all these studies was 15. Three investigated the role of AI chatbots in English language testing and assessment and two examined the topic of AI chatbots and academic integrity. Other topics are the impact of an AI chatbot on students' engagement, their critical digital literacies in language learning, the effects of students' beliefs of an AI chatbot on their intentions of using the chatbot, the effects of supportive environments on teachers' adoption of AI chatbots, effects of AI chatbots on English language teaching in general, and AI chatbots' English proficiency; each of these is the focus of one study.

Figure 6

Publication trends by researched aspects of AI chatbots

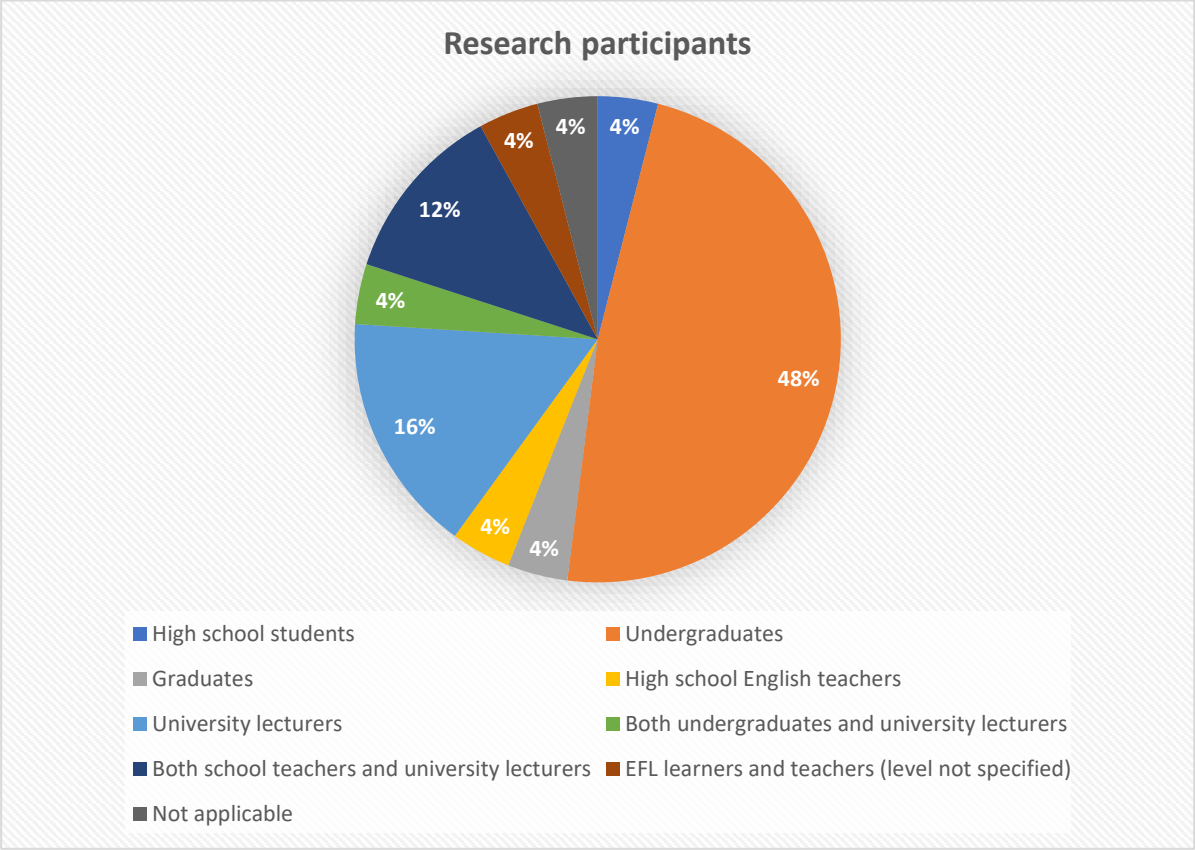


Note: One study may investigate more than one aspect of AI chatbots

Publication trends by research designs, participants, and data collection instruments

Figure 7

Publication trends by participants



As depicted by Figure 7, nearly half of the studies involved the participation of undergraduates while the second most popular research participant group was university lecturers, with 16 % of the reviewed studies having them as participants. One study had both of these groups as participants. The predominance of undergraduate and university lecturer participants suggests that research on AI chatbots in English language and teaching in Vietnam predominantly focused on tertiary education contexts. A review on the application of AI chatbots in English language and teaching by Huang et al. (2021) and another review addressing the role of AI in English language education by Sharadgah and Sa'di (2022) also arrived at the same result. Less popular participant groups are high schoolers, high school teachers, both school teachers and university lecturers as a group, and graduates. One study engaged both EFL learners and teachers at unspecified educational and institutional levels, whereas another study analyzed answers generated by AI, so there were no participants.

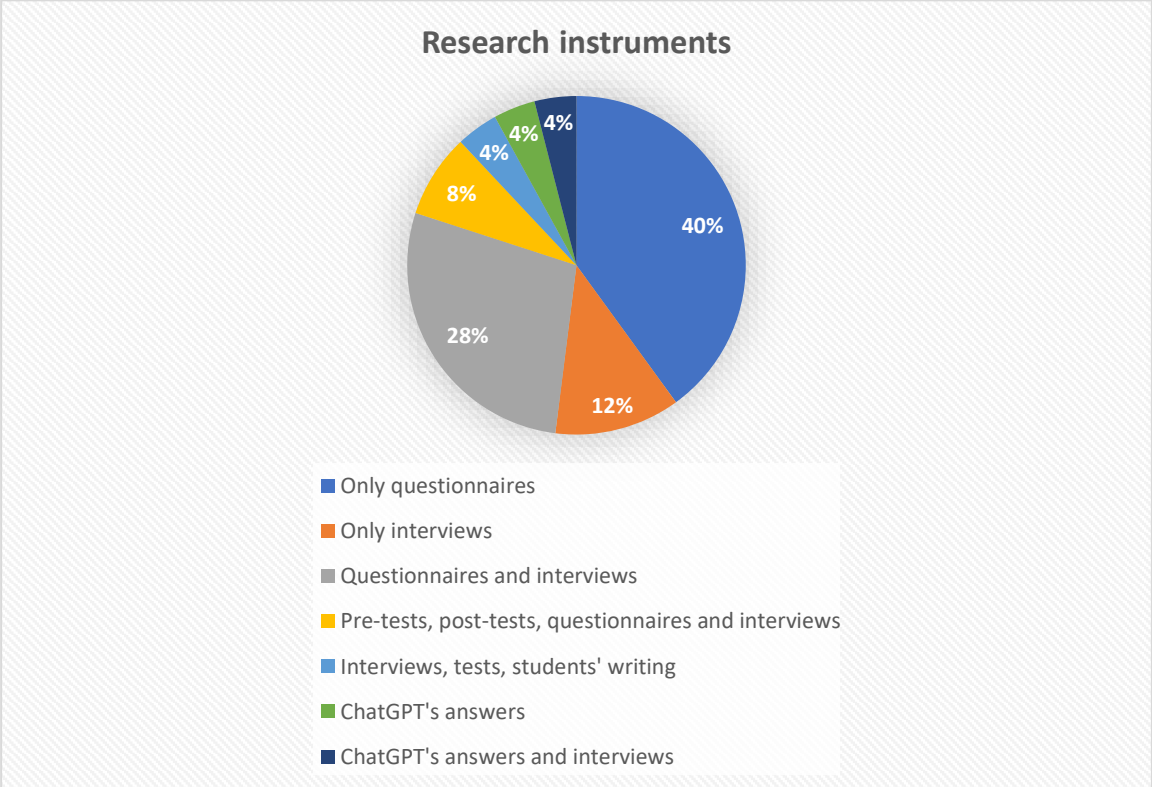
According to the data presented in Figure 8, the significant portion (60%) of the reviewed studies followed a mixed approach, collecting both qualitative and quantitative data. One-fifth of the studies were qualitative and quantitative studies had the same figure. Similar findings were reported by Lai and Lee (2024) and Sharadgah and Sa'di (2022) when reviewing the use of AI in English language and teaching.

Figure 8

Publication trends by research methods

Figure 9

Publication trends by data collection instruments



Studies utilizing only questionnaires to collect data accounted for 40% of all reviewed studies; 28% of those studies leveraged both questionnaires and interviews. The figure for studies using only interviews was 12%. One study (4% of the total) made use of pre-tests, post-tests, questionnaires and interviews as data collection instruments. Another used interviews, tests,

and students' writing. There were two studies that analyzed ChatGPT's answers to specific prompts, with one combining the evaluation of ChatGPT's answers with interviews.

Conclusion

Although the quantity of available studies on AI chatbots in English language education in Vietnam is growing, it is still limited. With the modest number of available studies, the volume of articles published by Scopus-indexed journals is still small. As a result, much space is left for the future research on this topic in the Vietnamese setting. Future research may consider increasing the variety of cities or provinces where the studies are set, making relevant comparisons. Apart from ChatGPT, there should be more studies investigating under-researched AI chatbots. Regarding specific topics, some unpopular ones such as AI Chatbots and academic integrity, AI chatbots' impact on students' critical digital literacies in English language learning, the application of AI chatbots in language testing and assessment, and AI chatbots' language competency may be taken into consideration. Concerning research designs, due to the fact that most of available studies involved participants from university contexts, it is recommended that prospective studies recruit participants from other contexts, for example, high schools, middle schools or even elementary schools. More studies should also take advantage of multiple instruments to gather data. Overall, based on the discoveries of the current review, this paper calls for more empirical studies on AI chatbots in English language teaching and learning in Vietnam.

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