Instructional Technology and Lifelong Learning Vol. 6, Issue 1, 128-182 (2025)

https://dergipark.org.tr/en/pub/itall

ITALL

Research Article

ISSN: 2717-8307

Implementations of Generative Artificial Intelligence Tools Within the Contexts of English Language Teaching and Learning: A Systematic Review

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Abstract

Generative Artificial Intelligence technologies have attracted considerable interest in various fields including language education where their potential to improve learning and teaching has begun to be explored. However, there is a lack of systematic reviews summarizing both the existing knowledge and gaps in this field. In this regard, this systematic review aims to explore the implementation of GAI tools in foreign language education, specifically within the contexts of ESL, EFL, ELL and ELT. Through searching on various data sources and identifying 823 articles, 39 articles were included based on the study's criteria. Aligned with the study objectives, the articles were analyzed in terms of many factors such as publication year, research method, learning place, target audience, utilized GAI tool, its role, data collection tool and method, study duration, sample selection type, data analysis method, main purposes, and results of the studies. The findings suggest that GAI tools, specifically ChatGPT, have the potential to enhance English language education in various contexts. By offering benefits such as providing personalized learning and feedback, ChatGPT enhances overall language proficiency. It develops language skills, particularly writing, boosts motivation and facilitates teaching. Despite presenting benefits for both English language learning and teaching, some concerns, including ethical issues, academic integrity, limiting creativity and misinformation, have been addressed, highlighting the importance of careful implementation to maximize their positive effects on English language education and suggesting that further research is needed.

Keywords: Generative Artificial Intelligence, Language Education, English as a Foreign/Second Language, English Language Teaching

Citation: Tuncer, N. & Hopcan, S. (2024). Implementations Of Generative Artificial Intelligence Tools Within the Contexts of English Language Teaching and Learning: A Systematic Review. *Instructional Technology and Lifelong Learning, 6(1)*, 128 - 182. https://doi.org/10.52911/itall.1696814

İngilizce Dil Öğretimi ve Öğrenimi Bağlamında Üretken Yapay Zekâ Araçlarının Uygulamaları: Sistematik İnceleme

Özet

Üretken Yapay Zekâ teknolojileri, dil eğitimi de dahil olmak üzere çeşitli alanlarda büyük ilgi uyandırmış ve bu teknolojilerin öğrenme ve öğretim süreçlerini iyileştirme potansiyeli keşfedilmeye başlanmıştır. Ancak, bu alandaki mevcut bilgiyi ve boşlukları özetleyen sistematik incelemeler konusunda bir eksiklik bulunmaktadır. Bu bağlamda, bu sistematik inceleme, üretken yapay zekâ araçlarının yabancı dil eğitiminde, özellikle İngilizceyi İkinci Dil Olarak Öğrenme, İngilizceyi Yabancı Dil Olarak Öğrenme, İngilizceyi Öğrenen Öğrenciler ve İngilizce Dil Öğretimi bağlamlarında uygulanmasını incelemeyi amaçlamaktadır. Çeşitli veri kaynaklarında yapılan aramalarla 823 makale belirlenmiş ve çalışma kriterlerine dayalı olarak 39 makale dahil edilmiştir. Çalışma hedeflerine paralel olarak, makaleler, yayın yılı, araştırma yöntemi, öğrenme yeri, hedef kitle, kullanılan GAI aracı, rolü, veri toplama aracı ve yöntemi, çalışma süresi, örneklem seçimi türü, veri analizi yöntemi, çalışmaların ana amaçları ve sonuçları gibi pek çok faktör açısından analiz edilmiştir. Bulgular, özellikle ChatGPT'nin, farklı bağlamlarda İngilizce dil eğitimini geliştirme potansiyeline sahip olduğunu göstermektedir. Kişiselleştirilmiş öğrenme ve geri bildirim sunma gibi faydalar sağlayarak, ChatGPT genel dil yeterliliğini artırmaktadır. Ayrıca özellikle yazma becerisi olmak üzere, dil becerilerini geliştirmekte, motivasyonu artırmakta ve öğretimi kolaylaştırmaktadır. Hem İngilizce dil öğrenimi hem de öğretimi için faydalar sunmasına rağmen, etik sorunlar, akademik dürüstlük, yaratıcılığı sınırlama ve yanlış bilgilendirme gibi bazı endişeler dile getirilmiştir. İngilizce dil eğitiminde olumlu etkilerini en üst düzeye çıkarmak için dikkatli bir şekilde uygulanmasının önemi vurgulanmakta ve daha fazla araştırma yapılması gerektiği önerilmektedir.

Anahtar Kelimeler: Üretken Yapay Zekâ, Dil Eğitimi, Yabancı/ İkinci Dil Olarak İngilizce, İngilizce Dil Öğretimi

Date of Submission	12.05.2025
Date of Acceptance	23.06.2025
Date of Publication	30.06.2025
Peer-Review	Double anonymized - Two External
Ethical Statement	It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.
Acknowledgments	This article is extracted from my master thesis/doctorate dissertation entitled "Implementations of Generative Artificial Intelligence Tools Within the Contexts of English Language Teaching And Learning: A Systematic Review", supervised by Sinan Hopcan (Master's Thesis, Bahcesehir University, Turkey/Istanbul, 2025).
Author(s) Contribution	**Tuncer:** Conceptualization, Methodology, Writing- Original draft preparation, Supervision, Data curation, Writing- Original draft preparation. **Hopcan:** Writing- Reviewing and Editing, Supervision, Validation
Plagiarism Checks	Yes - Turnitin
Conflicts of Interest	The author(s) has no conflict of interest to declare.
Complaints	italljournal@gmail.com
Grant Support	The authors acknowledge that they received no external funding in support of this research.
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1. Introduction

The ever-evolving nature of technology is continuously transforming every aspect of our lives, and artificial intelligence, as a central component of this evolution, is becoming the driving force of this transformation, as well as shaping both the present and the future. Artificial intelligence (AI), as defined by McCarthy (2007), " it is the science and engineering of making intelligent machines, especially intelligent computer programs" (p. 2). A further and more current definition of AI is "computing systems that are able to engage in human-like processes such as learning, adapting, synthesizing, self-correction and the use of data for complex processing tasks" (Popenici et al., 2017, p. 2). It is believed that the history of AI dates back to ancient times. A continuous series of advancements has contributed to the evolution of the development of the computer and what is currently known as AI for more than two centuries (Grzybowski et al.,2024). These technological innovations have led to its effective applications of AI across various fields. Among these fields, education stands out as one of the most significant areas in which AI applications have made a profound impact. Regarding its overall role in education and its impact on key subjects, AI has shown particular promise in language education as well.

Additionally, a discussion of AI would be incomplete without addressing its emerging subfield, Generative Artificial Intelligence (GAI). GAI is a large language model (LLM) which can produce a wide range of content across various formats, including text, audio, images, and video (Nah et al., 2023). The unique capabilities of GAI have drawn considerable attention in various fields, particularly in language education, with growing research interest following the release of ChatGPT in 2022. It has significant potential, especially in English language education, where it can support ESL, EFL, and ELT practices in multiple ways. Thus, examining the implementation of these applications holds great importance and research studies that focus on these issues are crucial. In this context, systematic reviews can also help us better understand the effects of these practices, as they aim to provide a comprehensive and unbiased overview of a specific topic or question by evaluating, summarizing, and synthesizing existing literature. "Systematic reviews answer predefined research questions using explicit, reproducible methods to identify, critically appraise and combine results of primary research studies" (Pollock & Berge, 2018, p. 138). In the literature, when examining systematic reviews, it is observed that there are a limited number of studies on the use of ChatGPT in foreign language education, particularly in the context of ESL, EFL, ELL and ELT. This highlights a gap in

research studies regarding the potential implementation of ChatGPT in language education including ESL, EFL, ELL and ELT fields. In light of this gap, recent research has started to explore the potential use of ChatGPT in different language educational contexts.

A systematic review by Balcı (2024) examined ChatGPT's role in EFL teaching and learning. Another review by Chukwuere (2024) evaluated the benefits and drawbacks of applying ChatGPT in higher education context. Likewise, in the systematic literature review by Sharifuddin ad Hashim (2024), it was aimed to explore the implementation, challenges, and impacts of AI in ESL classrooms in various countries. In addition, a systematic review by Lashari and Umrani (2023) investigated the potential benefits and implications of ChatGPT to support second language learning, while Zhang and Tur (2023) examined the utilization of ChatGPT in educational settings from kindergarten to 12th grade (K-12). Moreover, a systematic review by Feng Teng (2024) examined ChatGPT in EFL writing and Lo et al. (2024) explored the use of ChatGPT in ESL/ EFL education in their systematic review. Last, Meniado (2023) performed a rapid literature review to investigate the effects of ChatGPT on English language teaching, learning, and assessment, and Yang and Kyun (2022) carried out a systematic empirical literature review on AI-supported language learning in EFL and in some other languages.

Most of these studies highlight the need for further research to gain a more comprehensive understanding of GAI and AI implementation in English language learning and teaching. Since it serves the same purpose, this systematic review is important and can contribute to the literature. Upon reviewing the related studies in the literature, the present study is similar to those studies in terms of their topics and settings, but it also presents differences in terms of the scope of the topic and the language skills studied. For example, in this systematic review the focus is not limited to EFL, but also includes ESL and ELT studies. Likewise, it addresses studies on not only writing skills, but all language skills in general. Therefore, it is believed that conducting this study will fill a gap in the literature. In this context, the aim of this study is to explore the implementation of GAI tools in foreign language education, specifically within the contexts of ESL, EFL, ELL and ELT.

Taking all of these into consideration, this systematic review can help better understand the implementation of GAI tools in foreign language education. It can also make staying up to date with current research in the literature possible. Based on all this information, this review can be helpful and informative to researchers interested in pursuing work in this field, as well as to educators, students, and administrators, providing valuable insight for those seeking to gain a deeper understanding of this increasingly impactful topic.

1.1. Literature Review

1.1.1. The history of AI

Pirim (2006) quoted the words of Edward Fredkin, director of the MIT Computer Science lab, as follows: "There are three great events in history. The first of them is the formation of the universe. The second is the beginning of life. The third is the emergence of artificial intelligence." (p.2). The emergence of AI has been influenced and shaped by numerous important milestones. In 1950 the British mathematician Alan Turing addressed the question "Can machines think?", and by examining the combination of the terms "machine" and "thinking," Turing established the intellectual foundations of AI (Turing, 1950, p.50). However, the term AI was coined for the first time by John McCarthy in Dartmouth Conference, held by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon (Coskun & Gulleroglu, 2021), which played a key role in establishing AI as a recognized discipline (Bhutani & Sanaria, 2023). Similarly, Benko and Lányi (2009) state that the conference at Dartmouth was the first time when AI was discussed and attracted researchers' attention. AI has gone through various stages of developments from that point onward. For example: In 1965 ELIZA was written as an AI program and is considered the first example of natural language processing programs in AI; 1966 was the year in which Stanford University produced the first animated robot Shakey; the utilization of the Internet began in 1974; and finally, in 1981, the first personal computer was produced by IBM (Mijwel, 2015).

Arslan (2020) explains that the concept of Deep Learning was introduced by John Hopfield and David Rumelhartin in 1980s and in the following period, the 1990s, artificial neural networks, as information-processing structures that are linked in relation to communication but independent in relation to memory, introduced a new dimension to AI by imitating the human

brain. The author (2020) also remarks that in 1997, a supercomputer named Deep Blue defeated the world-famous chess player Kasparov.

The developments proceeded as follows: in the early 2000s, a robot named Kismet, which can use gestures and mimicry in communication was introduced; the robot ASIMO was introduced in 2005, as the closest robot to AI and human-like abilities and skills. In the 2010s some programs like Alphago, IBM Watson, personal assistants like Siri, and chatbots were introduced. AlphaGo, a computer program that was created by Google DeepMind in March 2016, defeated Lee Sedol, one of the greatest Go players of all time (Leach, 2022). In 2018, a transformer-based natural language processing model called BERT was released by Google (Aksu, 2024). In 2018, the language model, Generative Pre-trained Transformer (GPT-1) was presented by OpenAI (Radford et al., 2018). In 2019, OpenAI developed GPT-2 by using a larger dataset and adding more parameters to create a stronger language model; GPT-3, generating extended sequences of original text, was started with 175 billion parameters on May 14, 2020, as being 100 times more extensive than GPT-2 (Kumar, 2023). OpenAI later introduced the GPT-3.5 model in 2022, followed by GPT-4, released on March 14, 2023, it is far more than just an ordinary language model with its impressive ability to generate extensive text covering a vast number of words (From GPT-1 to GPT-4: A Look at the Evolution of Generative AI, 2023). From its early days to the present, AI has improved with technological innovations, thus resulting in its effective applications in various areas. AI applications can be classified into seven primary areas: machine learning, deep learning, natural language understanding, expert systems, robotics, computer vision, and speech recognition. They are also considered subsets of AI and the applications of these subsets exist in various fields, including healthcare, finance, manufacturing, retail, transportation, agriculture, human resources, law, marketing, and education.

1.1.2. AI in Language Education

Artificial Intelligence in Education (AIEd) has gained significant popularity, especially during the Covid-19 pandemic, which accelerated the implementation of technology-based educational tools (Pantelimon et al., 2021). AIEd refers to the application of AI technologies to support teaching, learning, and decision-making processes; computer systems with these technologies can provide personalized guidance, feedback, and support to students, as well as helping teachers and policymakers with their decisions, which can create new opportunities for

designing more effective learning activities and improving technology-supported learning environments (Hwang et al., 2020). AI has the potential to change the traditional understanding and functioning of education. The implementation of AI in education is revolutionizing how schools, teachers, and students interact (Lesia Viktorivna et al., 2022), leading to new opportunities for more effective learning environments.

AI has shown significant potential in language education as well. The use of AI in language learning offers various essential benefits, including personalized learning experiences (Luckin & Holmes, 2016), providing feedback (Karsenti, 2019), making corrections, assisting with pronunciation and speaking practice, and boosting student engagement and motivation. The implementation of AI in language education is achieved through various AI-based technologies and applications such as natural language processing (NLP), automated writing evaluation (AWE), and chatbots. NLP applications, such as language assessment tools and chatbots, have been integrated into English Language Learning (ELL) environments to facilitate language practice and interaction (Woo & Choi, 2021). The AI-based applications have the potential to support key language skills such as speaking, writing, listening, and reading as well as important language components like vocabulary and grammar, all of which are crucial for effective communication and comprehension. To illustrate, chatbots provide access to learning resources and assist students through engaging them in natural language conversations and offer immediate responses when help is needed (Suta et al., 2020). This can help improve speaking, vocabulary, and pronunciation skills. Furthermore, AWE, as an educational tool, can be used to assess students' writing by providing automatic feedback on aspects such as grammar, spelling, organization, and coherence, and to help learners improve their grammar and writing skills. AWE enables students by providing valuable insights into the types of errors they commonly make (Link et al., 2014).

While AIEd presents numerous benefits in educational contexts, such as improved learning experiences and teaching efficiency, there are also challenges within the scope of both education in general and language education. Regarding education in general, providing sustainable development of AI, inclusion and equity for AI, as well as preparing teachers for AI (Pedro et al., 2019) are some of the identified key challenges. It is emphasized that further research and collaboration between schools, teachers, and policymakers are needed to address these challenges

1.1.3. Generative Artificial Intelligence (GAI)

GAI is a type of AI that uses machine learning and deep learning to create new data such as images, music, and text (Yu & Guo, 2023). GAI, a subset of AI, differs from typical AI. Unlike traditional AI, which analyzes existing data, GAI, creates original content (Zhang et al., 2023). It operates through machine learning techniques, leveraging deep learning to generate artificial artifacts by identifying patterns in training data (Hu, 2023; Jovanović, 2023). GAI has significantly influenced various fields such as computer vision, natural language processing, and the creative arts (Bandi et al., 2023). Two major GAI types include Generative Adversarial Networks (GANs) for image and audio generation and Generative Pre-trained Transformers (GPTs) for language tasks (Baidoo-Anu & Ansah, 2023). Recent advancements, such as ChatGPT, has gained attention in multiple fields covering not only education (Tate et al., 2023; Williams, 2023), but also journalism (Pavlik, 2023), economics and finance (Alshater, 2022; Terwiesch, 2023), engineering (Qadir, 2023) and medicine (Nisar, & Aslam, 2023). Various GAI models exist, including text-to-image, text-to-3D, image-to-text, text-to-video, text-to-audio, text-to-science, text-to-code and text-to-text models (Gozalo-Brizuela & Garrido-Merchan, 2023). Text-to-text models, such as ChatGPT, have gained particular attention in education. Since its launch in November 2022, ChatGPT has sparked discussions about its impact on education, especially in language learning, as it demonstrates remarkable capabilities in handling complex educational tasks, leading to mixed reactions among educators (Baidoo-Anu & Ansah, 2023; Yu & Guo, 2023).

1.1.4. GAI in English language education

The distinctive features of GAI have sparked significant interest across various fields, including language learning and teaching. Likewise, researchers have recently focused on the use of GAI in education, especially following the release of ChatGPT in November 2022, which attracted public interest in the potential impacts of GAI on education (Yu & Guo, 2023). Trained on large amounts of textual data, ChatGPT and its models can "generate human-like text, answer questions, and complete other language-related tasks with high accuracy" (Kasneci et al., 2023, p.1).

Kasneci et al. (2023) further indicate that large language models like ChatGPT have the potential to enhance teaching and learning processes with their wide range of applications through offering valuable opportunities to improve educational experiences across all levels, from

primary to professional development. In the same way, Barrot (2024) defines ChatGPT as a groundbreaking tool in the field of language acquisition. In the realm of language learning and teaching, ChatGPT is able to facilitate the development of language skills. For example, a study by Song and Song (2023) found that using ChatGPT in writing resulted in significant improvements in both writing abilities and motivation. Similarly, it was revealed that in terms of providing instant feedback and creating learner-centered experiences, ChatGPT is a valuable tool (Xiao & Zhi, 2023).

Building on these insights, ChatGPT and similar GAI- based tools can also hold significant potential, particularly in the field of English language education, in which it can enhance ESL (English as a Second Language), EFL (English as a Foreign Language), and ELT (English Language Teaching) practices through various ways. As English is currently used as a lingua franca (Baker, 2009) in the world, the number of people learning English is increasing daily. The growing number of English Language Learners (ELLs) has made it essential to find new and effective teaching methods (Diallo, 2014). Within this framework, GAI tools play a vital role as they offer personalized and interactive language practice (Koraishi, 2023). Moreover, these tools support various language skills such as speaking, pronunciation, vocabulary, writing, grammar, and listening. For instance, in the speaking context, ESL and EFL learners can use chatbots to enhance their speaking abilities. Furthermore, it is believed that these chatbots are valuable tools for language learning because they create realistic scenarios and provide authentic learning experiences (Tai & Chen, 2024); they act as stress-free conversation partners to understand and produce language (Jeon et al., 2023; Yang et al., 2022), and offer personalized interactions based on learners' interests and proficiency levels (Dizon et al., 2022). Another language skill where GAI can be applied in ESL/EFL learning is in the development of writing skills. To illustrate, a study on the impact of ChatGPT on ESL students' academic writing skills, Mahapatra (2024) found that ChatGPT had a significantly positive effect on students' writing abilities, and students reported a favorable perception of this impact. GAIdriven tools like ChatGPT are attractive to EFL/ESL learners because they help develop language skills, offer unlimited, on-demand support, and available anytime and anywhere. In addition to the skills mentioned, there are also studies focusing on the improvement of other skills. Vo and Nguyen (2024) indicate that students can enhance vocabulary and grammar by utilizing ChatGPT to explain word forms, meanings, and usage.

Similarly, within the scope of ELT, GAI tools provide valuable opportunities to make both teaching practices and learning outcomes better. From the teaching perspective, GAI in ELT offers various benefits. Designing lesson plans and materials depending on students' needs, creating fun and engaging activities, and improving instructional materials can be achieved with the help of GAI. These tools, like ChatGPT, can be used to provide feedback on students' writing. A survey by Hong (2023) revealed that EFL teachers reported some benefits of using ChatGPT in ELT, such as enhanced student engagement, personalized feedback, and improved language practice. In a similar manner, in their study, Baskara and Mukarto (2023) focused on the use of ChatGPT in higher education ELT, and the results showed improvements in students' vocabulary acquisition and reading comprehension skills.

Despite offering benefits in the context of ESL, EFL, ELL and ELT, AI- based tools, specifically GAI tools, also have some drawbacks and limitations. To illustrate, ChatGPT has several limitations, including the potential for misuse, providing inaccurate information, offering unclear responses, and fostering dependency on technology (Kasneci et al., 2023); additionally, it may pose risks to academic integrity and equal access to education (Yan, 2023), and it can limit creativity and originality, suppress self-expression, and raise ethical concerns (Ningrum, 2023).

It seems that there is growing interest in the use of GAI in language learning. As technology continues to advance, further research and exploration of GAI implementation in English language education have great potential to improve language learning outcomes and enhance educational practices (Liu, 2024). As previously mentioned, this study aims to explore the implementation of GAI tools in foreign language education, specifically within the contexts of ESL, EFL, ELL and ELT. For this purpose, the research questions were as follows:

RQ1: What is the annual distribution of publications and the list of active countries in the selected studies?

RQ2: What journals and conferences are the selected studies published in?

RQ3: What research designs and methods are used in the selected studies?

RQ4: What learning contents, learning domains, learning places, and target audiences are explored in the selected studies?

RQ5: Which GAI tool has been used the most in the selected studies and what are its roles?

RQ6: What data collection tools and methods are employed in the selected studies?

RQ7: What sample sizes, study durations, and sample selection types are applied in the selected studies?

RQ8: What data analysis methods are commonly used in the selected studies?

RQ9: What are the main purposes and results of the selected studies?

2. Method

This study is a systematic review designed to identify and gather all relevant studies on the implementation of GAI tools in foreign language education, specifically within the contexts of ESL, EFL, ELL and ELT. Within this scope, a systematic review collects all available empirical data that fulfil the predefined criteria to address a specific research question (Higgings et al., 2019). Pollock and Berge (2018) state that current and robust systematic reviews are crucial for staying updated on the broad and continuously expanding research evidence. Systematic reviews are also valuable, as they save time for researchers. Mapping the existing published research and gaining awareness of current knowledge of a research topic can help researchers to utilize their time effectively and improve their research process (Yıldız, 2022).

2.1. Data Collection

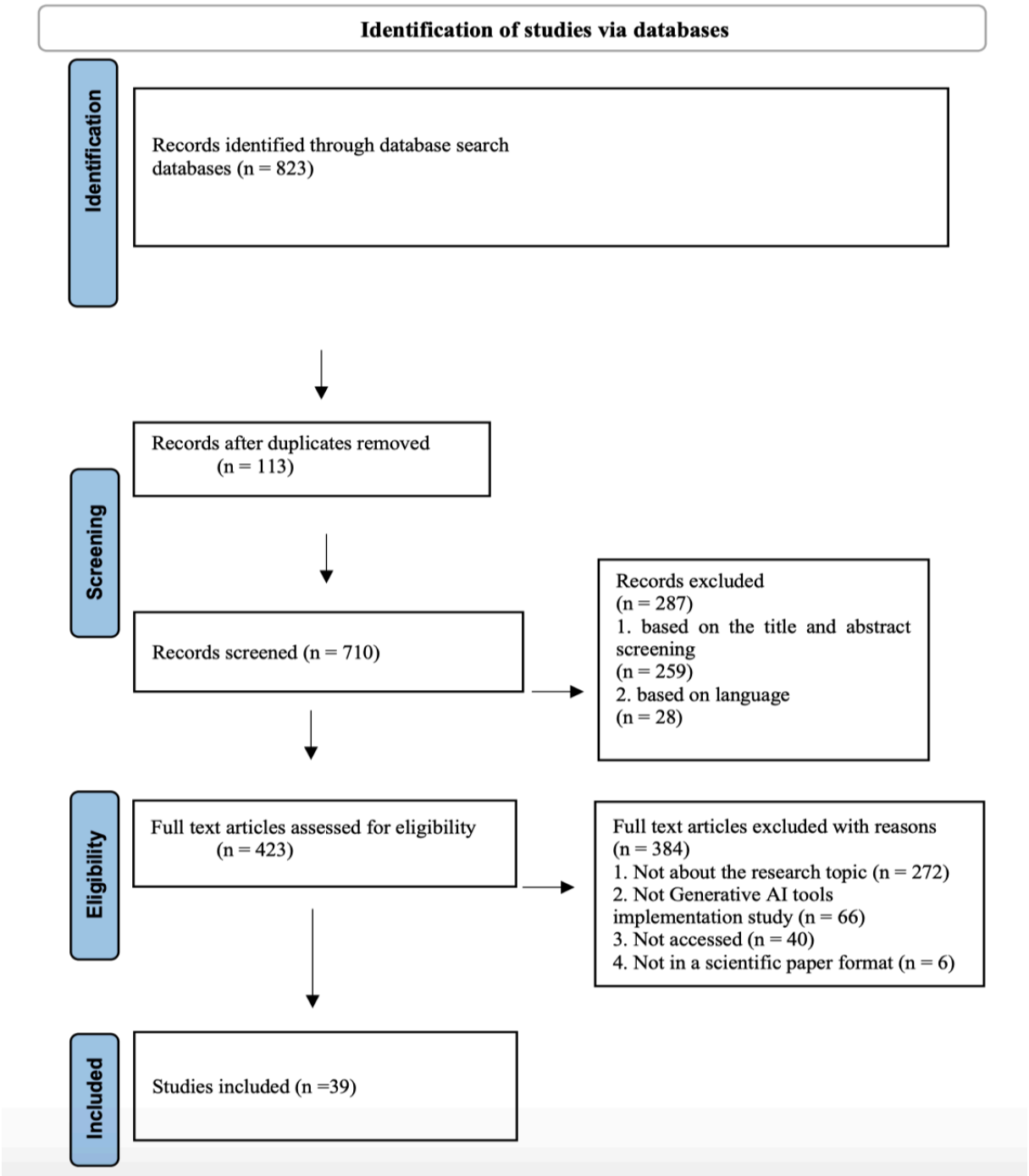
A systematic search was carried out across various databases: Academic Search Ultimate, Biomedical Index, Books at JSTOR, Business Source Ultimate, Complementary Index, DergiPark, Directory of Open Access Journals, eBook Index, ERIC, J-STAGE, JSTOR Journals, Korea Citation Index, MEDLINE, OAIster, OpenAIRE, Sage Knowledge, ScienceDirect, Scopus, Springer Nature Journals, The Belt and Road Initiative Reference Source. The search terms used were "generative artificial intelligence" or "generative ai" or "artificial intelligence" or "ai" or "gpt-3.5" or "gpt-4" or "gpt-4.0" or "chatgpt" or “gemini” AND "esl" or "english as a second language" or "efl" or "english as a foreign language" or "ell" or "english language learning" or "elt" or "english language teaching" or "language acquisition" or "language education" or "language learning" AND "k-12" or "kindergarten" or "primary education" or "secondary education" or "high school" or "university students" or "college students". Moreover, studies published before August 1, 2024 were included in the review.

2.2. Study Selection

Initially, 823 studies were obtained through scanning the databases. A total of 710 studies were defined and chosen for the review after removing duplicated ones. The remaining studies were reviewed again in light of the inclusion and exclusion criteria, and after eliminating those in different languages, 682 studies remained. Another elimination step was carried out by assessing those left for full text quality. There were 423 remaining, 40 of which were removed due to access issues. A further 344 papers were excluded for reasons such as being off topic and irrelevant to the subject of the study, not following the required scientific format, lack of eligibility for the scope of the research. The studies that met the quality criteria were included. Finally, after meticulous examination, a total of 39 articles were identified and considered appropriate for the study by perfectly meeting the eligibility criteria (Fig. 1). The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) was used to report this systematic review. PRISMA displays various steps in a flow diagram. Identification, screening, eligibility, and inclusion stages are presented to give a clear summary of the number of studies included and excluded at each stage (Siddaway et al., 2019).

Figure 1.

PRISMA publication selection flow chart.



2.3. Inclusion and exclusion criteria

Since some predefined terms and concepts in the review (e.g., ELT, EFL, and ESL) have been the subject of discussion for many years, no specific time frame has been set to select the studies. All relevant studies with participants from elementary level to university level were included. There are only a few studies in which university students are included along with a 45 small

number of graduate students. These studies were also included because they involved university students. Only articles, books, book chapters and conference papers were included. Any other kinds of written documents were excluded. The databases provided studies in various languages, but only studies in English were selected for this study. Studies that were outside the focus of the research topic were not involved.

The inclusion and exclusion lists were created based on specific criteria mentioned above. The criteria for including and excluding studies from this systematic literature review are presented below, in Table 1.

Table 1.

Inclusion and Exclusion Criteria

Inclusion	Exclusion
1.Studies must include a GAI tool. 2. The studies should be mainly about ESL, EFL, ELL, or ELT. 3. Selected studies must have been published in English. 4 Included studies must be in a journal, proceeding, or book/ book chapters. 5. Samples ranging from K-16 should have been studied. 6. Studies must be in full text.	1 Studies that fail to meet the inclusion criteria. 2 Studies which do not use a vigorous methodology or are written in an ambiguous way. 3 Studies that fall outside the scope of study. 4 Studies that are not categorized as a research study.

2.4. Data Collection Tools and Coding

In this systematic review an Excel template was created as a data collection tool. This Excel template was generated to work on the chosen studies. The Educational Technology Publication Classification Form (ETPCF) developed by Goktas et al. (2012) was utilized as a guide for the designing of this Excel template. The ETPCF has been used for similar studies as a data collection tool before. (Baydas et al., 2015; Kucuk et al., 2013). The ETPCF has five sections: Publication Information of the Article, Methodology, Data Collection Tools, Sample, and Data Analysis Method. Each section consists of relevant subheadings within itself. For the Excel template, some headings from the ETPCF were selected in alignment with the purpose and scope of the review. Additionally, some headings were also based on those in the study by Hopcan et al. (2023). Throughout the data processing stage in this review, studies were examined under 18 aspects, including title of the article, journal and conference, year of publication, country, purpose of the study, research method, learning content, learning place (for example, in school, out of school, or both, referring to where learning activities take place),

learner background, learning domain (for example, writing, speaking, reading and listening are four main language learning domains) data collection tools, type of GAI, study duration, sample size, sample selection types, role of AI technology, data analysis methods, and results of the studies.

The final version of the Excel template was defined, and all relevant data were carefully added to the Excel form. To ensure the effectiveness of the form, feedback was obtained by experts at specific time intervals.

2.5. Data Analysis

At this stage, as it is presented in the selection of studies section, a total of 423 studies were analyzed, and inclusion and exclusion criteria were applied to filter the studies. The remaining 39 articles were reviewed in detail. The data were processed in Excel, and then analyzed through graphs and tables.

Siddaway et al. (2019) emphasize that according to best practice guidelines for systematic reviews, the literature search and screening process should ideally be conducted by two independent reviewers, who must both agree on the studies to include, though this is often not feasible in practice. The authors (2019) further clarify that Cohen's kappa is one of the most suitable statistics for providing a quantitative measure of inter-rater agreement on the studies to be included. In this context, to calculate the Cohen's kappa value to assess interrater reliability, selected articles were separately coded by the researcher, and by an expert with extensive experience in systematic reviews. Two sets of codes were then compared side by side and Cohen's Kappa coefficient value was calculated. Cohen’s Kappa was 0.90. This may be seen as a nearly perfect agreement (0.81–1.00) (McHugh, 2012).

3. Results

RQ1: What is the annual distribution of publications and the list of active countries in the selected studies?

Figure 2.

Distribution of research on the use of GAI in ESL/ EFL/ ELL/ ELT by year (N=39).

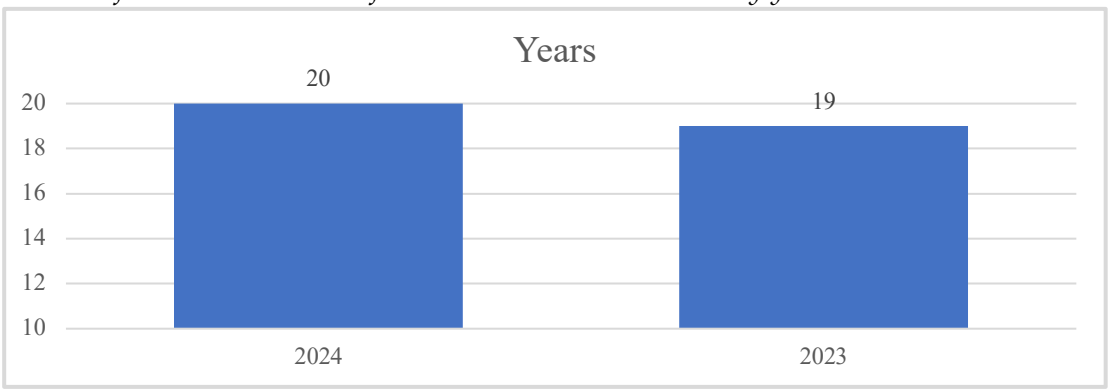


Figure 2 reveals that the number of the articles analysed by year is nearly the same, with a consistent interest in this area of research in recent years. Notably, in 2024, 20 studies were published, demonstrating a slightly higher output compared to 2023, which saw 19 studies being published.

Figure 3.

Countries in which research on the use of GAI in ESL/ EFL/ ELL/ ELT has been conducted.

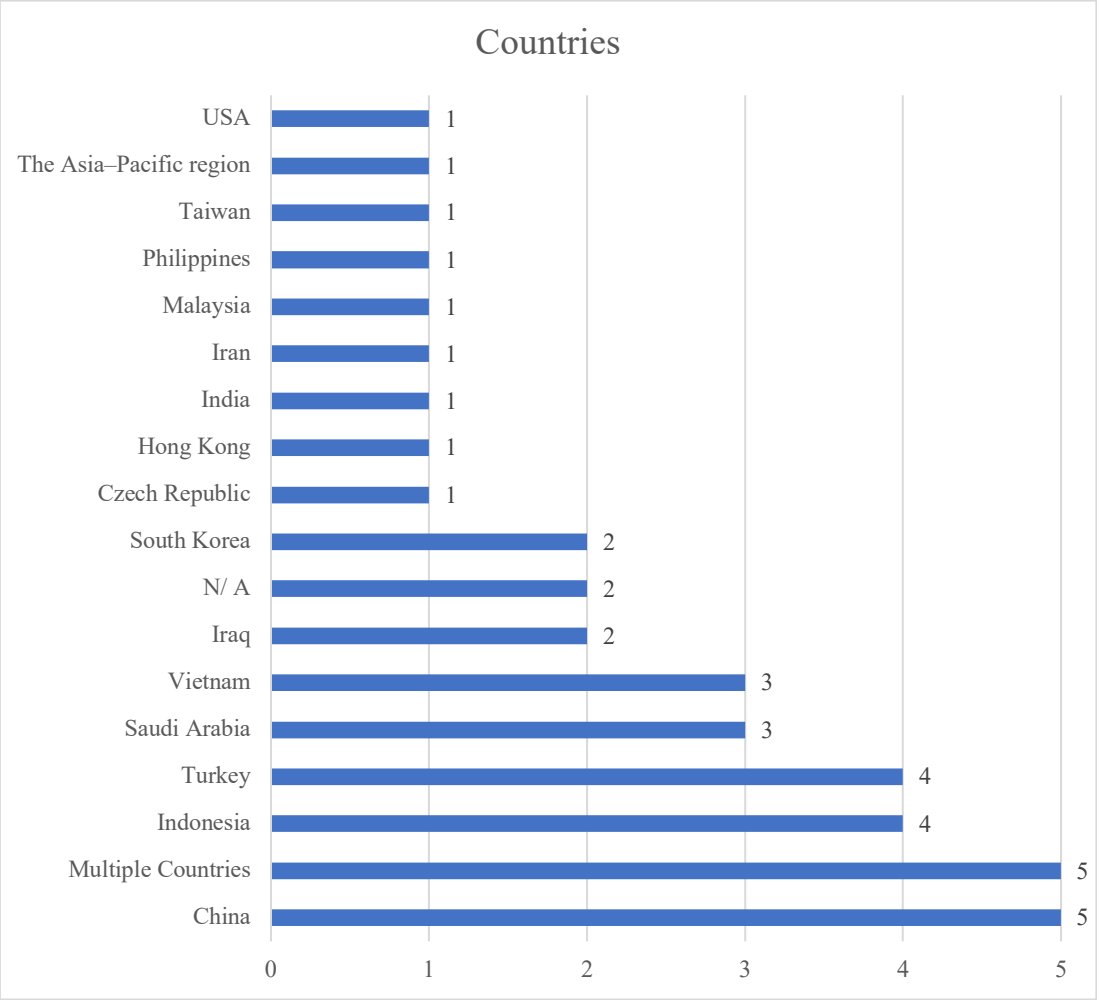
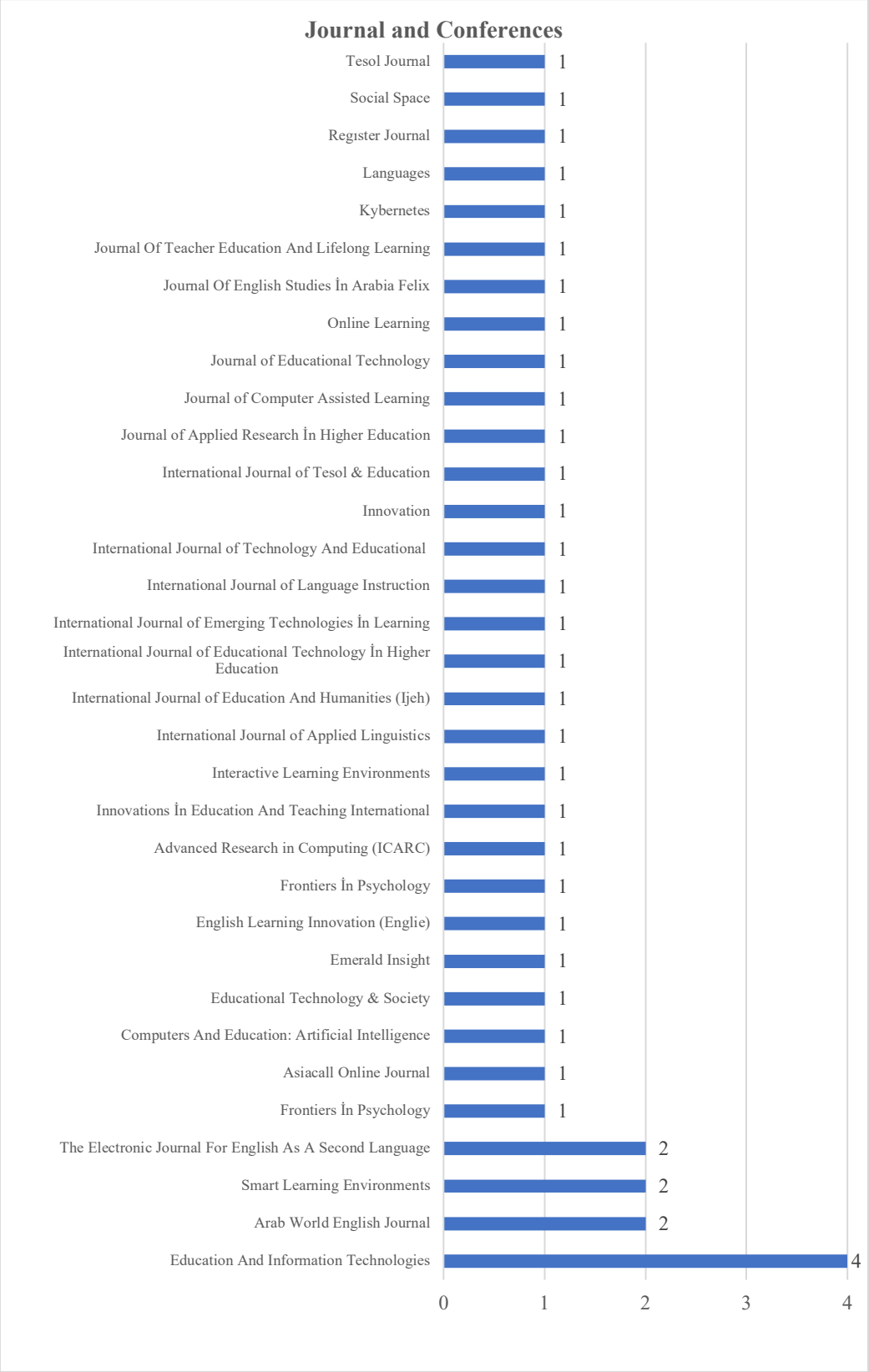


Figure 3 presents the countries in which research on the use of GAI in ESL/ EFL/ ELL/ ELT has been conducted. The highest number (n=5) of the selected studies were conducted in more than one country, in China and multiple countries including Northern and Southern China, Yemen, Saudi Arabia, Jordan, China, Hong Kong, Macao, and Taiwan). Among individual countries, Indonesia and Turkey had the second highest number of studies, with each accounting for four studies. This was followed by Vietnam (n=3) and Saudi Arabia (n=3). Fewer numbers of studies (n=2) were conducted in South Korea, Iraq, and in an unspecified country. The remaining studies were conducted in each of the nine other countries shown, with one study in each.

RQ2: What journals and conferences are the selected studies published in?

Figure 4.

Journals and conferences in the reviewed studies.

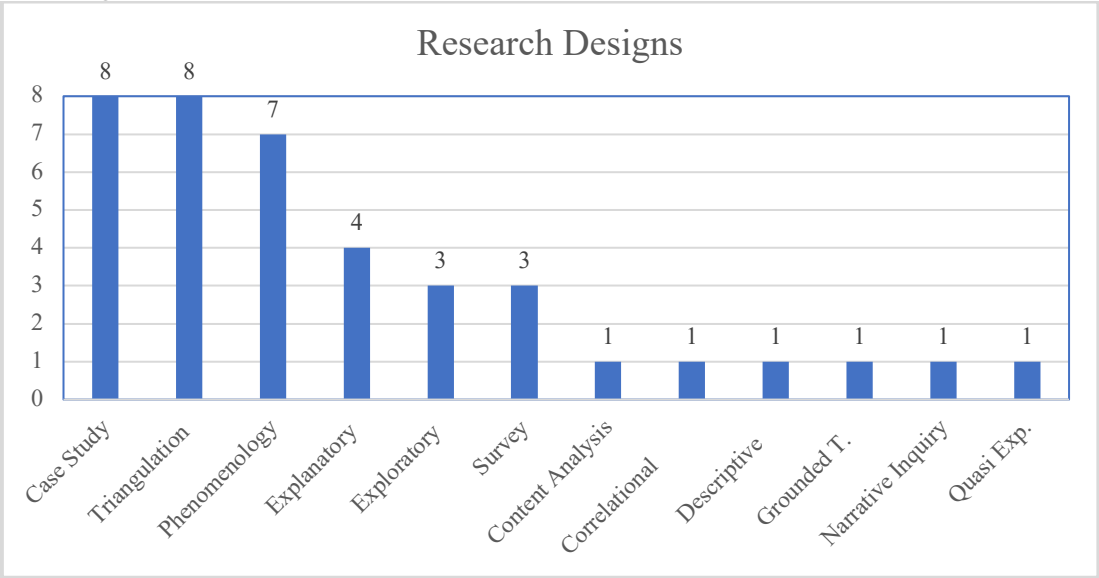


The majority of the research has been published in the Journal Education and Information Technologies (n=4). Additionally, two studies were published in each of the following journals: the Arab World English Journal, Smart Learning Environments, and the Electronic Journal for English as a Second Language. The remaining 29 studies are distributed across a range of other journals. Only one study was published as a conference paper in the study.

RQ3: What research designs and methods are used in the selected studies?

Figure 5.

Research designs used in the reviewed studies.



The figure shows the distribution of research designs employed in the reviewed studies. A total of eleven different designs were identified, with varying frequencies of use. The most frequently employed research designs were case studies and triangulation each used 8 times. The phenomenological method was also widely utilised (n=7). Additionally, explanatory designs were used 4 times, while exploratory and survey methods were each employed 3 times. The least frequently used research designs were the correlational, descriptive, grounded theory, content analysis, narrative inquiry, and quasi-experimental, each used only once.

Figure 6.

Research methods in the reviewed studies.

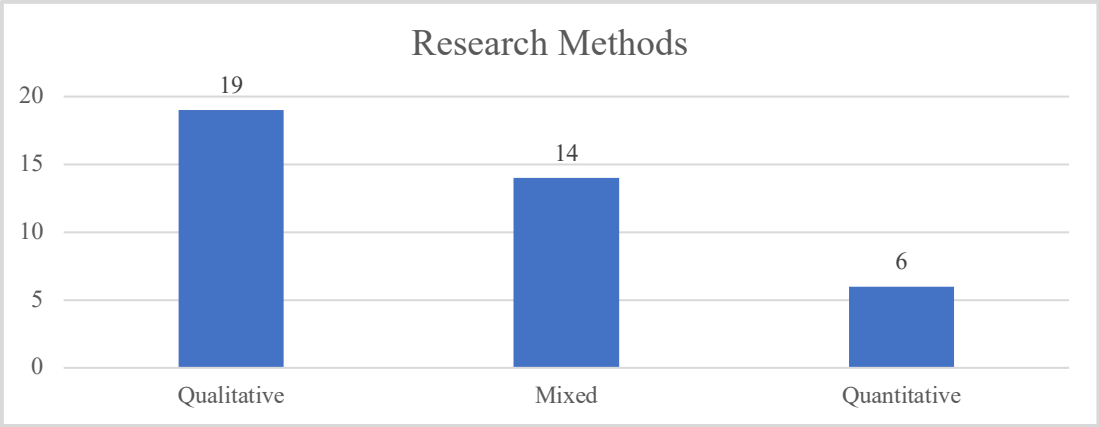
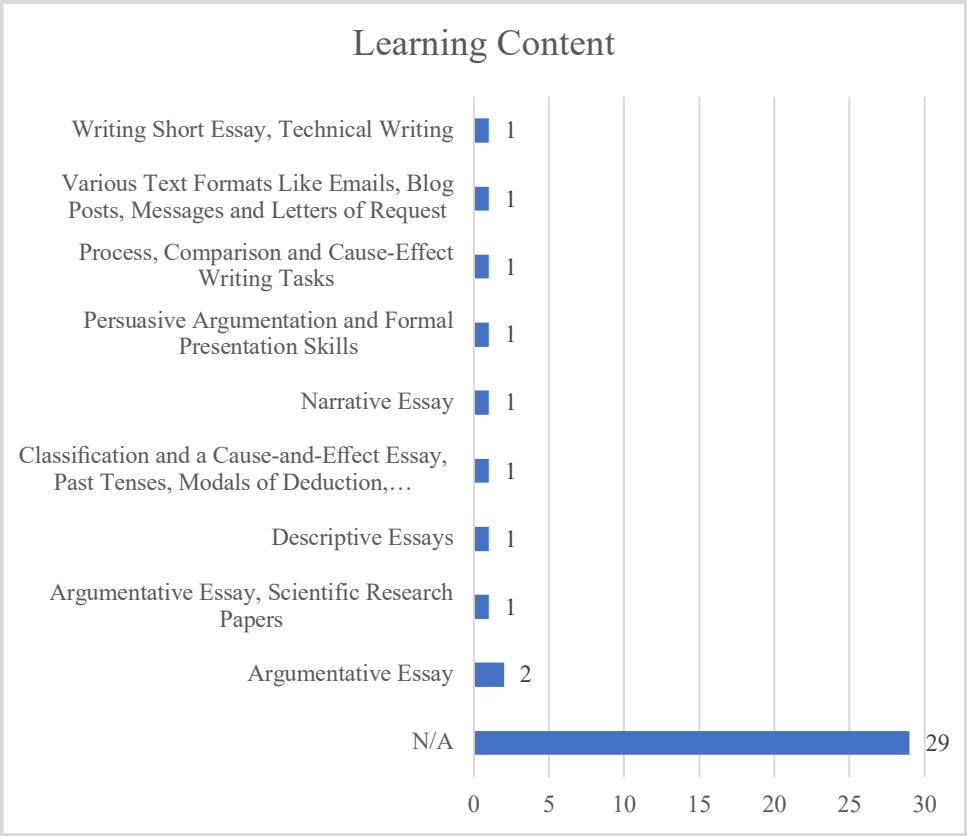


Figure 6 illustrates the research methods employed in the analyzed studies. The qualitative research method (n=19) was utilised in approximately half of the studies. The mixed (n=14) method was also preferred in a significant number of studies. In contrast, the quantitative method (n=6) was used the least.

RQ4: What learning contents, learning domains, learning places, and target audiences are explored in the selected studies?

Figure 7.

Learning contents of the reviewed studies.



Upon analysis of the learning contents as illustrated in the figure above, it is determined that most of the studies (n=29) either did not specify their preferred learning content or did not focus on a specific topic. Most frequently mentioned learning content was on argumentative essays (n=2). Following this, the reviewed studies identified various learning contents, each mentioned only once. These include argumentative essays and scientific research papers, descriptive essays, classification and cause-and-effect essays, some grammar-based contents, narrative essays, persuasive argumentation and formal presentation skills, and process, comparison, and cause-effect writing tasks. Additionally, diverse text formats such as emails, blog posts, messages, and letters of request, as well as writing types like short essays and technical writing, were also highlighted as learning contents.

Figure 8.

Learning domains in the reviewed studies.

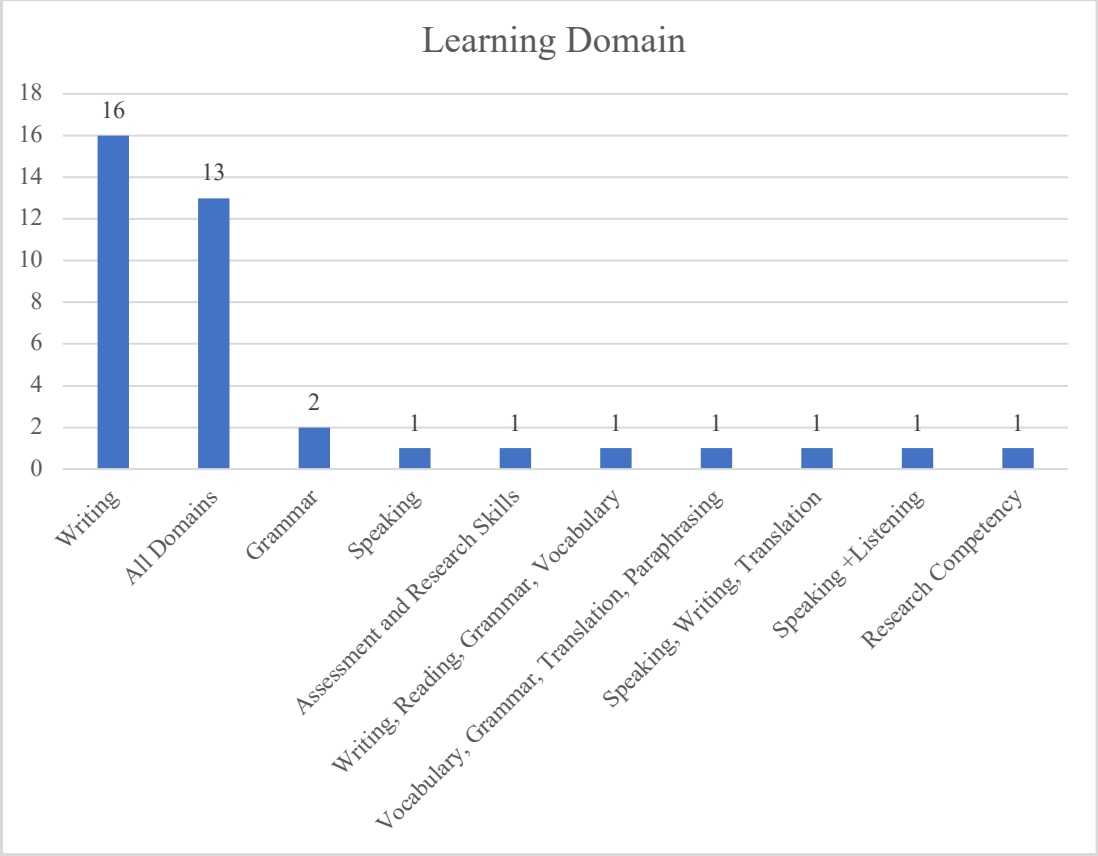
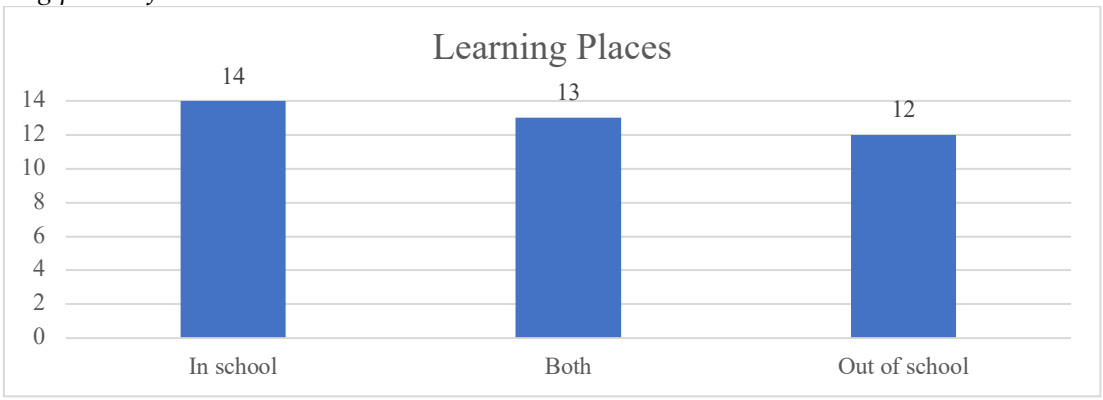


Figure 8 shows that writing (n=16) was the most frequently preferred learning domain in most of the studies. Subsequently, all domains (n=13), referring to language learning in general, without specifying only one language skill, was the second most frequently used learning domain. Among the learning domains that were least frequently focused were grammar, which was mentioned in two studies, speaking, assessment and research skills, and research competency, each appearing in only one study. In addition, some studies combined multiple skills, such as writing, reading, grammar, vocabulary, translation, paraphrasing, and speaking. Another study with a similar combination focuses on both speaking and listening (n= 1).

Figure 9.

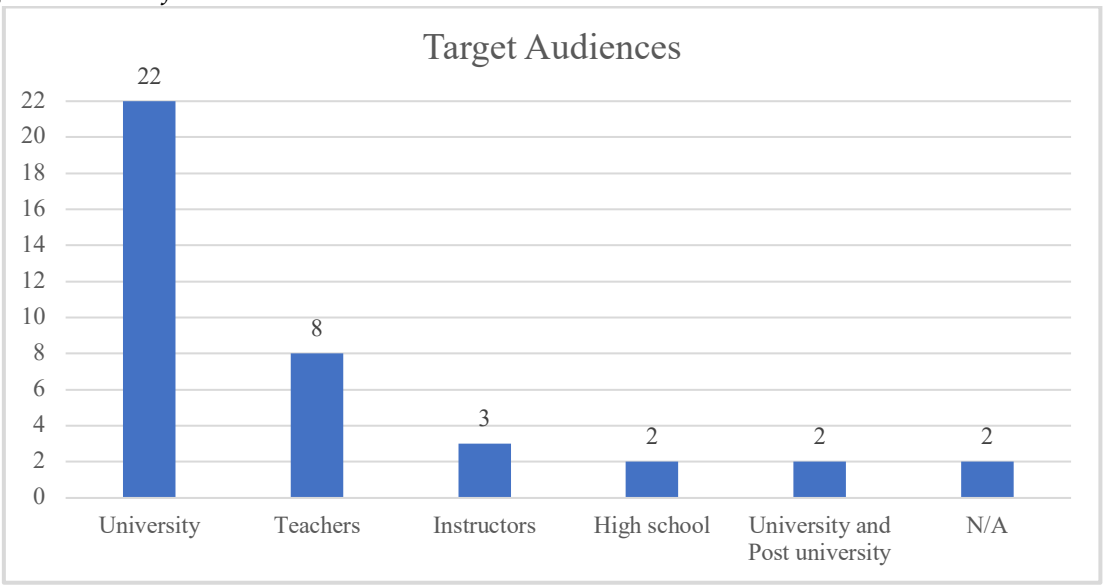
Learning places of the reviewed studies.



The learning places analysed in Figure 9 shows a similar distribution. It is determined that most of the studies were conducted in school settings (n=14), while some were carried out in out-of-school environments (n=12), and others encompass both settings (n=13).

Figure 10.

Target audiences of the reviewed studies.

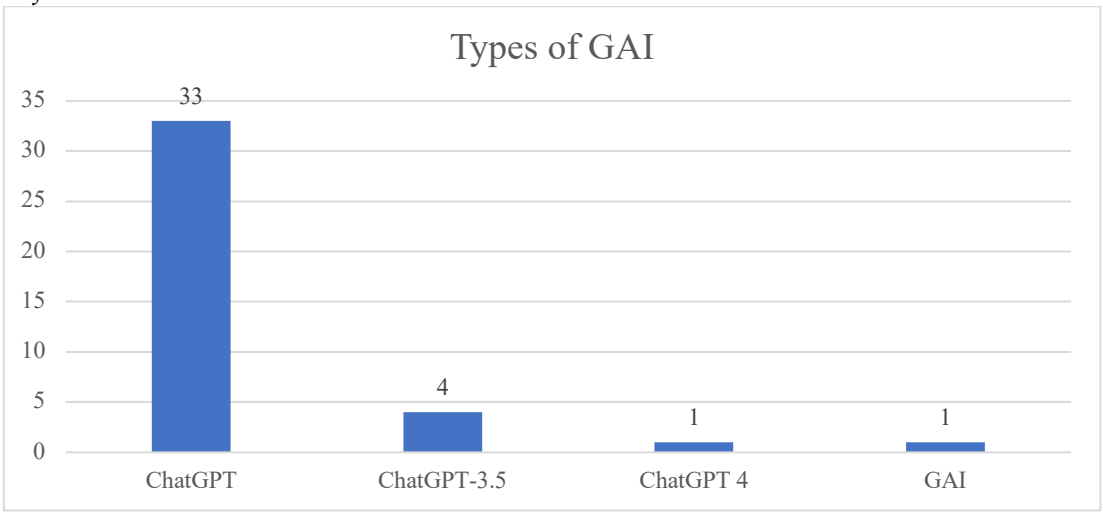


As seen in Figure 10, most of the studies were carried out at the university level (n=22). Teachers were the second-most targeted group, with eight studies involving them as participants. Instructors were also included in three studies. High school students and studies combining university and post-university participants were among the least represented target audiences, each appearing in two studies. Finally, two studies were categorized as N/A, reflecting either unclear or unspecified target audiences.

RQ5: Which GAI tool has been used the most in the selected studies and what are its roles?

Figure 11.

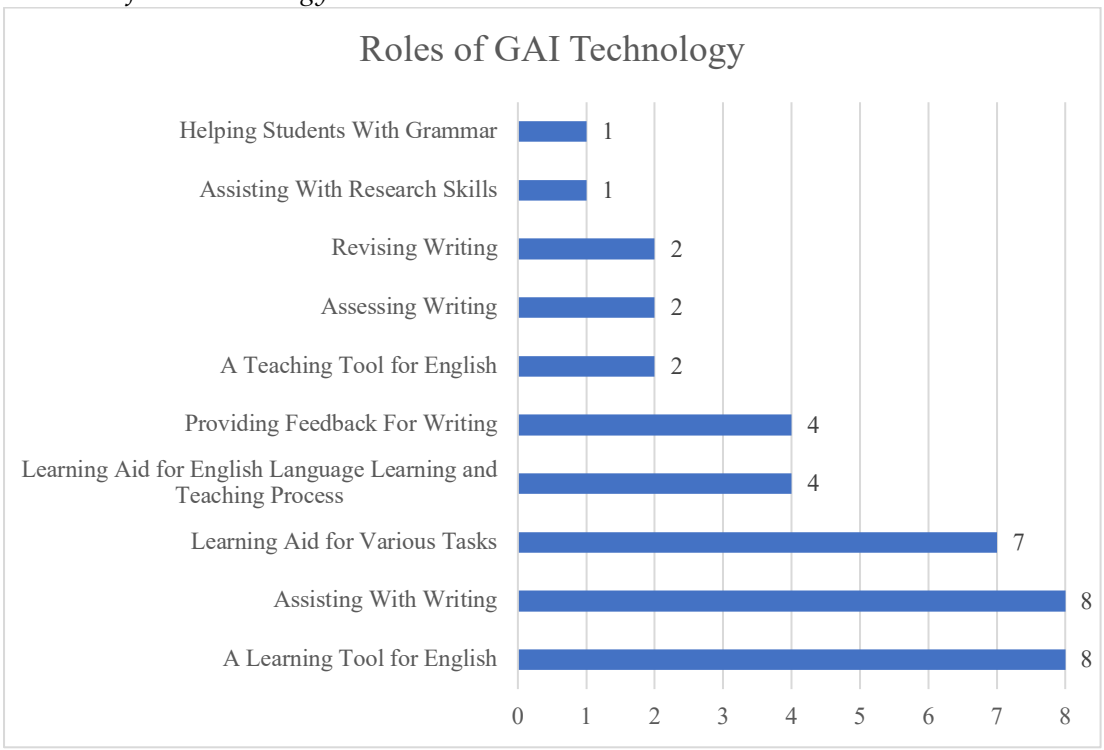
Types of GAI in the reviewed studies.



ChatGPT was used in most of the studies (n=33). ChatGPT-3.5 was the second most frequently used tool, being utilized in 4 studies. On the other hand, ChatGPT-4 and GAI tool, without specific version mentioned, were each used in only one study.

Figure 12.

The roles of GAI technology in the reviewed studies.



In most studies, GAI tools were used as a learning tool for English and writing assistance to enhance learning, with each mentioned in 8 studies. Subsequently, the tools served as a learning aid for various tasks, identified in 7 studies. GAI technologies were also used as a learning aid

for English language learning and teaching processes and for providing feedback on writing with each mentioned in 4 studies. Other roles of these tools were revising writing, assessing writing, and serving as a teaching tool, with each mentioned in two studies. GAI technologies were the least frequently utilized for assisting with research skills and for helping students with grammar, each appearing in only one study.

RQ6: What data collection tools and methods are employed in the selected studies?

Table 2.

Data Collection Tools In The Reviewed Studies

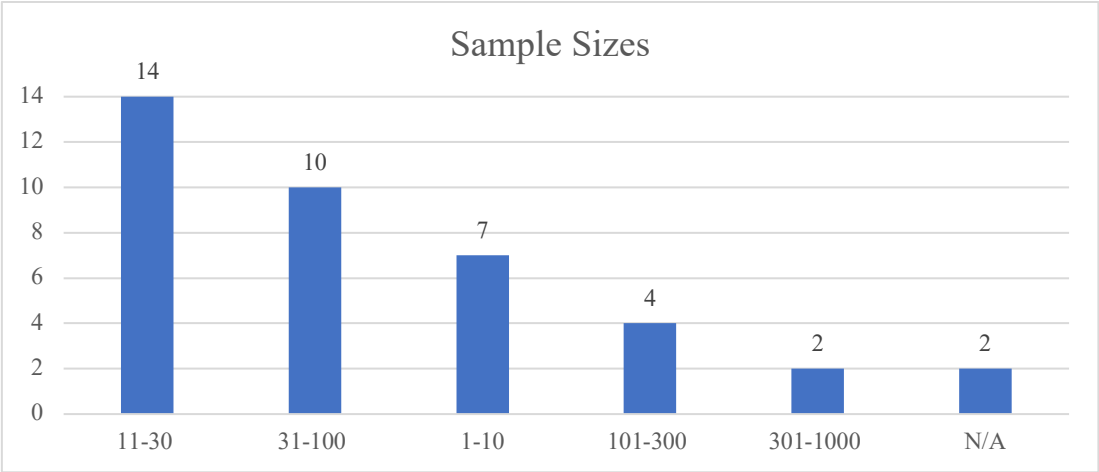
Data Collection Tools	Frequency (f)	Percentage (%)
Interview	23	33%
Questionnaire	13	19%
Observation	7	10%
Achievement Tests	6	9%
Document	6	9%
Others	3	4%
Survey	3	4%
Email interviewing	2	3%
A dataset (RECIPE4U)	1	1%
A paragraph writing task	1	1%
Attitude or perception tests	1	1%
E-Portfolios	1	1%
A writing rubric	1	1%
Two demographic questionnaires	1	1%

The most frequently used data collection tool is the interview, including semi-structured, structured, and unstructured interviews, accounting for 33% of the total. The next most frequently employed data collection tools are the questionnaire which accounts for 19%, including Likert scales, open-ended questions, and multiple-choice items, and participant observation, which makes up 10%. Several other data collection tools, each employed in 6 studies (9% of the total) are achievement tests and documents such as daily learning logs, students' written works, and their reflective writings. The remaining tools, stated as others accounts for 4%, included reflective journals, discussion, and written feedback by teachers and ChatGPT. Among the tools, survey was employed in 4% of the cases, while email interviews were used in 3%. The least used tools were a dataset RECIPE4U, attitude or perception tests; e-portfolios; a paragraph writing task, a writing rubric, and two demographic questionnaires, each accounting for 1%.

RQ7: What sample sizes, study durations, and sample selection types are applied in the selected studies?

Figure 13.

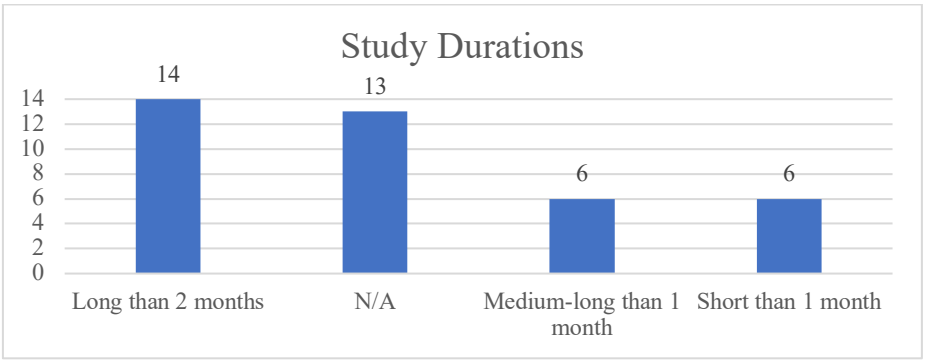
Sample sizes in the reviewed studies.



Most studies were conducted with 11-30 participants (n=14). Almost one in four studies involved a sample size of 31-100 participants (n=10). A smaller subset of studies (n=7) featured sample sizes between 1 and 10 participants. Only a small number of studies (n=4) included larger sample sizes of 101 to 300 participants. Moreover, very few studies (n=2) incorporated even larger sample sizes of 301 to 1000 participants. Finally, two studies did not specify their sample sizes (N/A).

Figure 14.

Study durations in the reviewed studies.

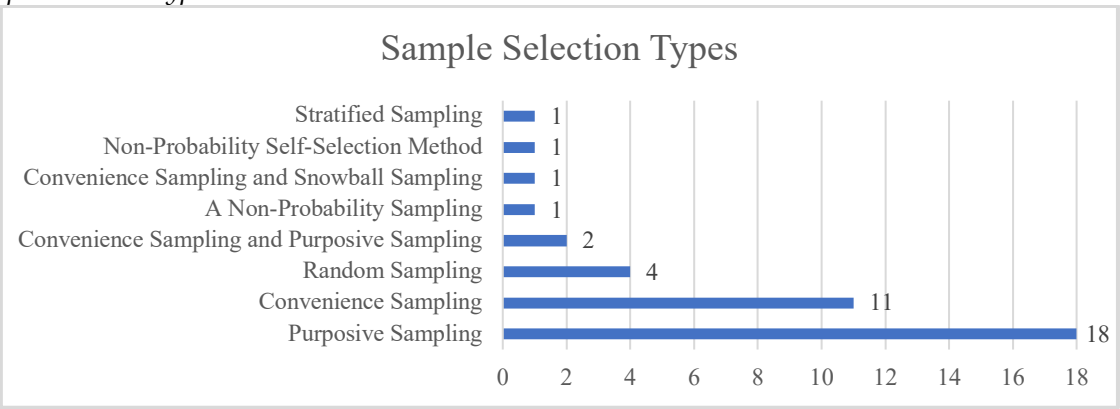


The longest study duration was longer than two months, with 14 studies falling into this category. A smaller number of studies (n=6) were conducted over shorter durations, specifically less than one month. Similarly, an additional six studies categorized as medium length, lasting

more than one month, were also present. Multiple studies (n=13) did not specify the duration of the study, which was marked as N/A.

Figure 15.

Sample selection types in the reviewed studies.



The most widely used method was purposive sampling, which was employed in 18 studies. The second most utilized method was convenience sampling, with 11 studies. Random sampling was used in 4 studies, representing a smaller group. The least utilised types were non-probability sampling, convenience sampling and snowball sampling, non-probability self-selection method, and stratified sampling, each was used in only one study.

RQ8: What data analysis methods are commonly used in the selected studies?

Table 3.

Data Analysis Methods İn The Reviewed Studies

Data Analysis Methods	Number	Percentage (%)
Thematic Analysis	18	29
Descriptive Analysis	16	25
Content Analysis	8	13
Inductive Coding	4	6
T Test	4	6
Inferential	3	5
ANOVA	2	3
Non-Parametric Test	2	3
ANOVA/ANCOVA	1	2
Comparative Analysis	1	2
Correlation	1	2
Factor Analysis	1	2
RM-ANOVA	1	2
SEM	1	2

The table presents the data analysis methods used in the reviewed studies, showing a variety of approaches used with different frequencies. Thematic analysis was the most frequently

employed method, appearing in 18 studies. Subsequently, the descriptive analysis method was employed in 16 studies. Following this, content analysis was utilized in 8 studies. Furthermore, inductive coding and T-Test were each used in four studies, while inferential methods were used in three studies for data analysis. The least utilised data analysis methods were ANOVA, ANOVA/ANCOVA, non-parametric test, comparative analysis, correlation, factor analysis, RM-ANOVA, and SEM, each appearing in only two studies or fewer.

RQ9: What are the main purposes and results of the selected studies?

Table 4

Objectives of the reviewed studies.

No	Objectives
1	To investigate the role of GAI in grading academic writing.
2	To examine the impact of ChatGPT on language learning.
3	To examine the effect of ChatGPT on advancing learners' feedback literacy.
4	To evaluate ChatGPT's impact on EFL grammar instruction.
5	To explore ChatGPT's influence on students in English classes.
6	To examine EFL students' use of ChatGPT for research skills.
7	To determine methods for enhancing ChatGPT use among English learners.
8	To explore ChatGPT's role in English Language Teaching.
9	To examine students' perceptions of ChatGPT in foreign language learning.
10	To examine why teachers implement ChatGPT.
11	To explore how ChatGPT influences writing skills of ESL students.
12	To analyse the implementation of Generative AI in education.
13	To examine factors causing technostress in English teachers using GenAI tools.
14	To explore the effect of using ChatGPT-generated dialogues in language teaching.
15	To investigate the impact of AI tools on English writing skills.
16	To evaluate ChatGPT's ability to provide feedback on EFL students' writing.
17	To examine students' views of ChatGPT in English language learning.
18	To explore EFL students' experiences and perceptions of ChatGPT in language learning.
19	To examine its effectiveness as a self-editing tool for student writing.
20	To examine EFL students' experiences of using ChatGPT in writing.
21	To explore the potential of ChatGPT in EFL teaching.
22	To examine the use of ChatGPT for feedback in L2 writing.
23	To explore the impact of ChatGPT in L2 writing.
24	To investigate the effect of ChatGPT on foreign language learners.
25	To examine EFL teachers' views on ChatGPT's opportunities and challenges in L2 education.
26	To explore EFL special education teachers' views on ChatGPT in language learning.
27	To examine EFL students' experiences of using ChatGPT in writing.
28	To explore EFL learners' intentions to use ChatGPT for English learning.
29	To evaluate the effectiveness of AI-generated feedback on writing.
30	To explore how ChatGPT influences learning English.
31	To examine the effectiveness of the ChatGPT in identifying writing errors.
32	To examine students' views of ChatGPT in language learning.

33	To explore the impact of ChatGPT in EFL writing.
34	To investigate the dimensions of ChatGPT in English language learning.
35	To explore the impact of ChatGPT on student motivation and engagement.
36	To examine students' views of ChatGPT in English language learning.
37	To investigate the efficacy of ChatGPT in language teaching.
38	To examine EFL teachers' views on ChatGPT's in language teaching.
39	To examine teachers' views on ChatGPT's in language teaching.

Table 3 shows the aims of the analysed studies. In general, the implementation of GAI tools like ChatGPT in English language education, in terms of various aspects such as their impact and role in learning and teaching processes, was examined. In addition, some studies aimed to examine opinions, motivation, and perceptions of participants in relation to the role of GAI.

Table 4.

Results of the Reviewed Studies

No	Results
1	Aligns with human scores, helping L2 writing assessment.
2	Enhancing language, linguistic, and social skills; increasing motivation and engagement with repetition.
3	Improving students' feedback literacy and offering a framework for classroom integration
4	Supporting grammar learning and enjoyment but raising concerns about critical thinking.
5	Enhancing language skills, confidence, and collaboration; positive student attitudes.
6	Positively correlating with metacognitive awareness, supporting guidance and idea generation.
7	Aiding L2 interaction practice; teacher-led activities can enhance its use.
8	Mostly positive outcomes: boosting enthusiasm, engagement, and enjoyment, though some drawbacks (technical limitations, shortcuts, and need for human intervention) noted.
9	Seen as valuable for enhancing language learning; requiring careful, ethical integration in teaching.
10	Traditional methods prompted ChatGPT implementation in ELT, offering benefits (language skills, personalised learning, facilitating teaching), but also raising concerns (hinders creative thinking, a new software program, academic integrity, misinformation).
11	Positively impacting academic writing; viewed favourably as a practical, reliable feedback tool.
12	Viewed as humanlike and intelligent, students felt at ease asking it questions they'd avoid with teachers.
13	Rapid AI growth and limited training cause technostress; professional development and gradual implementation ease this and support TPACK.
14	Enhancing academic performance, self-confidence, motivation, and English vocabulary learning.
15	Improving English language learning, particularly writing skills (descriptive).
16	Providing more feedback than teachers, focusing equally on content, language, and organization, whereas teachers prioritized content and language.
17	Effective for ESP vocabulary, translation, grammar, and paraphrasing, but students still value teacher guidance.

18	Valued as a helpful partner for language tasks.
19	Improving formal writing but was seen as less useful for informal and neutral register.
20	Supporting writing with feedback, idea generation, structuring, and critical thinking.
21	Enhancing EFL teaching with immediate feedback but may limit research skills, critical thinking, and risk bias or misinformation.
22	Improving L2 academic writing with an active and strategic use, students' feedback-seeking abilities are shaped by academic background, metacognitive skills.
23	Assisting L2 writing but posing concerns for academic integrity and equitable access.
24	Improving writing, grammar, vocabulary, and student motivation and engagement.
25	Boosting learner autonomy, and reducing teacher workload, but posing risks to creativity, academic integrity, cheating, plagiarism, and misinformation.
26	Valued in special education; female teachers are more eager to use it.
27	Aiding translation, idea generation, and writing, but concerns including misinformation and academic dishonesty.
28	EFL learners' intent to use ChatGPT is driven by social influence, satisfaction, and performance expectancy.
29	No difference in learning outcomes between the group receiving writing feedback from ChatGPT and the group receiving feedback from their human tutor. Study 2: a group receiving feedback from both ChatGPT and human tutor, having slight preference difference; both human and AI feedback offering advantages.
30	Found motivating for reading and writing but students were neutral on its impact for listening and speaking.
31	Catching surface errors; human instructors detecting deeper and pragmatic issues.
32	Helping personalized learning, interaction, and productivity, boosting writing and language skills.
33	Boosting writing skills, motivation, and proficiency in organization, coherence, grammar, and vocabulary.
34	Supporting language development through feedback and acting as a guided practice partner.
35	Enhancing motivation, engagement, and language skills; experienced instructors aid listening motivation.
36	Supporting English learning, independence, and problem-solving; information security is a concern.
37	ChatGPT scores align with teachers' and can help reduce teacher workload in language teaching.
38	EFL instructors are eager to use ChatGPT; training is needed for effective use.
39	First-year teachers recognize GAI's potential, but they lack readiness due to limited knowledge.

Table 4 presents the findings of the analysed studies. In general, it was concluded that the use of ChatGPT in English education facilitated language skill development, (particularly in writing), promoted learning, supported English language learning and teaching processes, and enhanced the motivation of the participants. The necessity of training was indicated for its careful implementation in English language education. In addition, ethical issues, misinformation, and academic dishonesty were expressed among the concerns raised in the studies.

4. Discussion

The first research question in this systematic review aimed to investigate the publication years and countries in which these studies were conducted. The studies were evaluated based on these criteria. One of the findings of this review is that most research studies on GAI in foreign language education in ESL, EFL, ELL and ELT contexts have been conducted in recent years, particularly between 2023 and 2024. The reason for this may be due to the recent emergence of one of the GAI tools, ChatGPT. Since its launch in November 2022, it has raised a mix of excitement and concern among education professionals (Kostka & Toncelli, 2023) and it continues to progress rapidly (Vo, 2024). Teachers and students have also been exploring ways to implement ChatGPT for teaching and learning foreign languages (Vo & Nguyen, 2024), and numerous studies have been carried out to examine the use of ChatGPT in language education (Baskara, 2023; Bin-Hady et al., 2023; Kohnke et al., 2023; Vo & Nguyen, 2024).It can be concluded that the rapid development of GAI in recent years has also influenced the studies conducted in this field. In terms of annual distribution of publications, the results of this study are similar to those of other systematic reviews in the literature. Each of the following studies included studies from 2023: 2023 and 2024 (Balcı, 2024); January 2023 and July 2023 (Chukwuere, 2024); 2023 and 2024 (Feng Teng, 2024), May 15 and August 22, 2023 (Meniado, 2023); all included studies are from 2023 (Zhang & Tur, 2024).

The countries in which the studies were conducted varied when analysing the distribution of active countries in the selected studies. It has been observed that researchers from 18 different countries have conducted studies on similar topics. China had the highest number of studies (n = 5), followed by Indonesia (n=4), Turkey (n= 4), Multiple Countries (n=5), Saudi Arabia (n= 3), Vietnam (n= 3), and Others (n= 15) including 12 different countries. The studies include countries from various continents and regions. Similar to this result, in the related study by Lo et al. (2024) it was reported that nearly half of the included studies (n = 34) were conducted in East Asia, with China accounting for 12 of these studies. The findings of another systematic review by Feng Teng (2024) reveal that researchers in China published more articles (8 out of 20) on the topic of ChatGPT in EFL writing than scholars from other countries. However, in some studies, this distribution of countries may vary. A wide geographical distribution, covering regions in Africa, Europe, the Americas, and Asia are presented in the findings of a systematic review (including 13 studies) by Zhang and Tur (2024). Evidently, the ChatGPT

phenomenon is a global area of interest in education and the exploration of the implementation of this GAI tool in educational settings has gained significant importance. Research studies focusing on this phenomenon seem to be supported worldwide.

Regarding research designs and methods, the analysis of the review revealed that over fifty percent of the studies are qualitative (n = 19), with different research designs (phenomenology, case study, content analysis, narrative inquiry, grounded theory and exploratory). This reflects that the use of this method facilitates a deep understanding of the phenomenon, emphasizing participants' experiences and perspectives. Qualitative research is used to gain a detailed understanding of an issue by directly engaging with people and allowing them to share their stories without influence from expectations of findings or what has already been discussed in the literature (Creswell & Poth, 2018). In brief, the deeper understanding of participants' experiences, perceptions, and viewpoints provided by qualitative methods may explain the greater use of qualitative methods in these studies. Similarly, to evaluate the implementation of GAI tools in language education, existing research may rely more on individual experiences and observations rather than analyses based on numerical data. Creswell and Poth (2018) further state that when quantitative measures and statistical analyses are not suitable for addressing the problem, qualitative research can be employed. On the other hand, there are also six quantitative studies, which employed various research designs including correlational, quasi-experimental, pre-experimental, survey, and descriptive designs. Mixed method (n=14) was also widely used, incorporating exploratory, triangulation, and explanatory designs. The widespread use of mixed methods may indicate that combining quantitative and qualitative data can provide a more comprehensive assessment of the use of GAI in language education. Mixed method research creates an opportunity to build new theoretical insights by integrating the strengths of both quantitative and qualitative approaches (Venkatesh et al., 2016). In relation to research designs, it is believed that they are used to explore the phenomenon from multiple angles, validate study findings, and provide detailed explanations. To illustrate, triangulation is a technique to examine a phenomenon by integrating and combining various data sources, research methods, researchers, and theoretical frameworks (Wang & Duffy, 2009). Using multiple methods of data collection and analysis gives a deeper and more complete understanding of the research (Patton, 1999) and it is a process that allows for data validation, used both in quantitative and qualitative research (Noble & Heale, 2019) When examined in the

context of similar studies, previous studies by Balcı (2024) and Zhang and Tur (2024) reported that those reviewed studies also adopted various research designs including quantitative, qualitative and mixed methods. However, with some studies, there have been differences in regard to the most commonly used research methods. In the findings of the systematic review by Lo et al. (2024) many of the included studies employed a quantitative method (n= 26), followed by qualitative (n=23) and mixed methods approaches (n= 21). Despite differing in the number of methods used, the diversity of methods available in this systematic review and related systematic reviews may indicate that both empirical data and participants' experiences are important in the exploration of the implementation of GAI tools in language education.

In terms of learning domains, the findings show that writing is the most emphasized learning area in the selected studies. This may be the case because of its importance in language acquisition. One of the hardest skills to master in English learning is writing skills due to the complexity of this ability (Pratama & Hastuti, 2024). In addition to being a means of communication, writing is an important productive skill that improves ESL/EFL students' language learning and development (Jamoom, 2021). Research has been carried out to explore the effectiveness of implementing technology in EFL/ESL writing (Al-Wasy, 2020; Zhao, 2023; Gayed et al., 2022). Similarly, several studies were conducted to explore the potential role of the GAI tool, ChatGPT, in EFL writing (Guo & Wang, 2024; Nugroho et al., 2024). Studies specifically addressing language skills apart from writing are few, such as speaking (n=3), grammar (n=3) and some studies focus on more than one skill at the same time, such as speaking, writing, translation (n=1); grammar, vocabulary, translation, paraphrasing (n=1); and writing, reading, grammar, vocabulary (n=1). Additionally, significant focus was given to all domains, including general English language skills (n=13), which may mean that a more holistic approach is emphasized in use of GAI technology in relation to language skills in the selected studies. This signifies that in these studies, English language education was addressed in general, without focusing specifically on individual skills. However, areas like assessment and research skills, research competency, and vocabulary are given less attention (with only one study for each), which may suggest a potential gap in research. More attention might be given to these specific learning domains in research studies in the future to gain a better understanding of the implementation of their relationship to GAI tools. Likewise, findings of a recent review by Lo et al. (2024) indicate that many selected studies (71) have focused on how

students use the tool ChatGPT for writing (n= 29), followed by another primary English language skill, speaking (n= 5). Learning domains were not specified in various studies (n= 28), and the impact of ChatGPT on other language skills has not been sufficiently studied. It has been indicated in the review findings that the lack of studies on reading (n= 2) and listening (n=0) reveals that more research is needed in these areas. In another review by Yang and Kyun (2022), which examines artificial intelligence in language learning in various contexts including EFL (17 studies out of 25), writing skills (n=10) were the most studied aspects of language learning. It is followed by other aspects of language learning, including learning attitudes (n=5), reading (n= 3), two studies for each of the following: vocabulary, speaking, and communication and grammar (n=1). From the results of these systematic reviews, it can be inferred that GAI technologies have been implemented mostly in writing skills, with lesser use for other skills.

In terms of target audiences explored in the selected studies, most of the studies have been conducted at the university level (n=22), while there are two studies conducted at the high school level. Only a few studies (n=2) include both university and a small number of graduate students at the same time, and these studies were also included in the review because they involved university students. Instructors (a term used for those at the university level), and teachers were also included in some studies (n= 11) to explore their experiences for the implementation of GAI tools in language teaching (Moorhouse, 2024; Nguyen Thi Thu, 2023). This study's findings are consistent with previous research by Lo et al. (2024) and Meniado (2023), who also reported higher education as the setting in which most of the studies were conducted. The rapid review results by Chukwuere (2024) highlight that using ChatGPT in higher education offers several benefits. It is true that there has been growing interest in understanding the implementation of GAI tools in English language education across different target audiences, specifically among university students. It may be because university students are more open to independent learning and the integration of technology in education, as well as having easy access to ChatGPT.

When examining which GAI tool is most frequently used in the selected studies and what its role is, many studies used ChatGPT without specifying the model (n= 33). In some studies, ChatGPT-3.5 (n= 4) and ChatGPT 4 (n= 1) were used. In one study, the tool was defined as GAI (n= 1). The widespread use of ChatGPT and its versions as GAI tools in these reviewed studies could be due to the growing interest in ChatGPT since its launch. There has been a parallel

increase in research within this field. Many educators have explored the GAI tool ChatGPT for its potential advantages in language teaching and learning (Liu, 2023). The findings of this study align with the literature. Within the scope of related studies, several researchers conducted systematic reviews to specifically examine ChatGPT among GAI tools. They sought to explore its implementation (Lo et al., 2024), impact (Meniado, 2023), and role (Feng Teng, 2024) within the scope of English language education, as well as its advantages and drawbacks (Balcı ,2024, Chukwuere, 2024), its possible benefits and consequences (Lashari & Umrani, 2023), and its strengths, weaknesses, opportunities, and threats (Zhang & Tur, 2024). It can be stated that ChatGPT is one of the most widely used GAI tools in research.

In relation to the roles of GAI tools, the findings showed that ChatGPT and its versions have been used for many purposes. Learners used these tools as an English learning tool (n=8) for various tasks (n=7). They are also used in several studies for writing domainrelated activities, such as assisting with writing (n=8), providing feedback for writing (n=4), revising (n=2) and assessing writing (n=2). The tools were also used to receive assistance with grammar (n=1) as well as for research skills (n=1). Similarly, the tools were used for English language teaching as well (n=4). The results of the study demonstrate similarities with the findings of other related studies. Some of its potential functions have been identified as a lesson planner, teaching assistant and developer of instructional materials (Meniado, 2023), feedback provider, personal tutor, language learning partner (Zhang & Tur, 2024), and facilitator and assistant in EFL writing (Feng Teng, 2024). It can be concluded that ChatGPT is considered a useful tool for many different purposes in language learning and teaching. Its implementation in ELT further indicates its potential not just for learners, but also for educators.

Regarding the data collection tools and methods used, data was mostly collected by interview or focus group (n= 24) through semi structured, structured, and unstructured formats, followed by questionnaires (n=13) including Likert, open-ended, and multiple-choice questions, and observation (n=7). Documents (n=6), such as selfstudy logs, collection of students' interactions on ChatGPT, teacher self-reflection, students' written work, daily learning logs and reflective writings; achievement tests (n=6); survey (n=3); others (n=3), such as reflective journals, discussion and written feedback were also utilized to obtain data. Email interviews, a dataset, a writing task, attitude, or perception tests, rubric and two demographic questionnaires are among the least used measurement tools (one for each) in the selected studies. Obtaining data

through interviews and questionnaires highlights the importance of collecting detailed and direct feedback from participants in these studies. Interviews are useful for understanding participants' thoughts, feelings, attitudes, and experiences regarding certain situations or phenomena (Paradis et al., 2016). Similarly, the systematic review by Balcı (2024), found that similar tools, like interviews and questionnaires, were used in mixed-method studies. The findings of the systematic review by Lo et al. (2024) are also similar to this study, though surveys were reported as the most common data source, followed by interviews. To obtain more reliable results, it is necessary to use a variety of data collection tools (Hopcan et al., 2024).

Examination of the durations of the studies revealed that the longest study durations exceeded two months (n = 14). Additionally, there were studies with durations of less than one month (n = 6) and medium-length studies lasting more than one month (n = 6). Furthermore, the duration was not specified in 13 studies. It can be inferred that these selected studies do not have such long durations in general, which is similar to the findings of the review (Lo et al., 2024). In this respect, the authors further indicate that more longterm studies are needed to gain a deeper understanding of how ongoing interaction with ChatGPT influences students' language acquisition and its lasting impact on their learning behaviour.

Regarding the research question which addresses the main purposes and results of the selected studies, the findings reveal that the objectives of the analysed studies are similar to each other within the context of English language education and can generally be summarized as follows: To examine the impact and/or role of GAI tools, specifically ChatGPT, on EFL/ESL learners' language proficiency, language skills, and language learning (Al-Obaydi et al., 2023; Bin-Hady et al., 2023; Javier & Moorhouse, 2023; Karatas et al., 2024; Kostka & Toncelli, 2023; Kucuk, 2024; Nugroho et al., 2023; Xu & Thien, 2024). The results that align with the stated research aim as follows: Nugroho et al. (2023) reported that ChatGPT facilitates personalized learning, encouraging authentic interactions, productivity, enhances writing and vocabulary acquisition. Similarly, Karataş et al. (2024) reported that ChatGPT positively impacts students' language learning, particularly in the development of writing, grammar, and vocabulary skills and improves motivation and engagement in the learning process, but its impact on speaking was minimal, and there was no effect on listening skills. Regarding language skills, it was also reported by Kucuk (2024) that ChatGPT is beneficial for students to learn grammar and makes learning enjoyable; however, some concerns were raised in relation to its potential to transform

students into robots and weaken their critical thinking abilities. Moreover, ChatGPT is reported to support language learning (Al-Obaydi et al., 2023), and increase students' enthusiasm for course material (Kostka & Toncelli, 2023).

Another goal in some studies is to investigate the implementation/role of ChatGPT in EFL/ ESL writing (Al-Garaady & Mahyoob, 2023; Escalante et al., 2023; Geckin et al., 2023; Gozali et al., 2024; Guo & Wang, 2024; Han et al., 2024; Mahapatra, 2024; Nguyen & Tran, 2023; Nugroho et al., 2024; Punar Özçelik & Yangın Ekşi, 2024; Pratama & Hastuti, 2024; Song & Song, 2023; Tseng & Lin, 2024; Yan, 2023; Yan, 2024). With respect to the research objective, the results showed that studies primarily focus on the writing skill. It is reported that ChatGPT had a positive impact on students' academic writing skills (Mahapatra, 2024); and was beneficial for students in writing courses by providing instant feedback, generating ideas, accelerating the writing process, aiding in structuring their thoughts, offering unbiased feedback as an alternative to peer reviews, and encouraging critical thinking (Tseng & Lin, 2024). It also enhanced students' writing skills (Punar Ozcelik & Yangın Eksi, 2024); served as a supporting tool to improve English language learning, particularly writing skills (Pratama & Hastuti, 2024); and, in their engagement with ChatGPT in writing, students felt comfortable asking it questions they might avoid asking teachers (Han et al., 2024). Likewise, Geckin et al. (2023) reported that ChatGPT-3.5 can facilitate writing assessment. Conversely, it was reported by Al-Garaady & Mahyoob (2023) that ChatGPT identifies most surface-level errors, whereas human instructors detect deep structural and pragmatic writing issues; its potential threats to academic integrity and equal access to education were also identified as a threat (Yan, 2023).

Regarding the research aiming to explore students' and/or teachers' perceptions, attitudes, views and experiences of ChatGPT in English language learning and teaching processes (Alenizi et al., 2023; Abdelhalim, 2024; Derakhshan & Ghiasvand, 2024; Klimova et al., 2024; Liu, 2023; Nguyen Thi Thu, 2023; Phuong, 2024; Van Horn, 2024; Xiao & Zhi, 2023), reported results include enhancing multiple language skills, improving confidence, and fostering collaborative learning (Van Horn, 2024); being a supportive tool in providing guidance and stimulating thought (Abdelhalim, 2024); and acting as learning partner and providing feedback (Xiao & Zhi, 2023). Phuong (2024) indicated that students found ChatGPT effective for ESP vocabulary, translation, grammar checking, and paraphrasing, but still expressed a strong need for teacher instruction and the traditional classroom setting. Similarly, Liu (2023) reported that

Chinese university students are in favour of using ChatGPT to learn English outside of school by spending more energy and time to learn to use it in a better way. Despite being considered a useful tool for enhancing language learning, it requires careful consideration of ethical and pedagogical factors in its implementation (Klimova et al., 2024). Similarly, the need for proper training to use ChatGPT effectively (Nguyen Thi Thu, 2023) was identified. Some concerns such as posing risks to creativity, academic integrity, spreading false information, fostering cheating in online exams, and plagiarism (Derakhshan & Ghiasvand, 2024) were also reported.

In relation to the implementation/role of ChatGPT in the context of ELT (Annamalai, 2024; Kohnke et al., 2024; Mohamed, 2024; Moorhouse, 2024; Nguyen & Tran, 2023), the results of the studies showed that ChatGPT can improve language teaching by enhancing classroom activities (Mohamed, 2024), reduces teacher workload (Nguyen & Tran, 2023), and facilitates educators in enhancing their teaching approaches by helping with the development of teaching materials, and generating content (Annamalai, 2024). The author (2024) also highlighted that when planning teaching activities, developing a blended learning strategy is essential to combine ChatGPT with traditional methods. Moorhouse (2024) reported that first-year teachers are generally prepared to implement GAI tools due to early experience and awareness of their potential, whereas beginning teachers, with limited knowledge, are not yet ready to use them in their professional work. However, some concerns, such as its potential to restrict fostering research skills and critical thinking, reinforcing biases, and spreading misinformation (Mohamed, 2024) were reported.

Concerning the results of examining the impact of ChatGPT on student motivation and engagement (Ali et al., 2023; Sotelo Muñoz et al., 2023; Yıldız, 2023), Ali et al. (2023) reported that students found ChatGPT to be a motivating tool for improving reading and writing skills, while having neutral attitudes towards its impact on listening and speaking skills. As a source of intrinsic motivation (Sotelo Muñoz et al., 2023), the implementation of ChatGPT can boost students' academic performance, self-confidence, and motivation, and positively impact vocabulary learning in English (Yıldız, 2023).

Similar to this study, there are some systematic reviews that examine the implementation of GAI tools, such as ChatGPT, in English language education from similar perspectives. Regarding language learning and teaching processes, some results of this study align with the

findings of the research by Balcı (2024), reporting that ChatGPT enhanced students' EFL learning experiences and positively influenced teachers' instructional practices. Similarly, in relation to language skills, the review findings showed that ChatGPT improves language proficiency and core language skills, including speaking, listening, reading, grammar, vocabulary, and especially writing, while also boosting student motivation. The results align with those of another systematic review by Feng Teng (2024) that emphasized the opportunities of ChatGPT for EFL writing, like enhancing writing skills and providing instant feedback. Lo et al. (2024) reported that most of the studies examined AI tools within a writing context, which is also in line with this study results. Like this review, the study by Zhang and Tur (2024) also highlighted ChatGPT's potential to aid in designing curriculum, planning lesson, creating materials and enhancing student personalized learning. The findings are consistent with previous research by Meniado (2023) who also found that ChatGPT improves the language learning process inside and outside the classroom. The findings of this systematic review also align with previous systematic reviews in terms of reported concerns. Issues including academic integrity (Zhang & Tur, 2024), its limitations and ethical issues (Balci, 2024), reliance on AI and need for critical thinking skills (Feng Teng, 2024), educational inequality, academic dishonesty, and plagiarism (Meniado, 2023) were in alignment with this study's results. Some studies such as Lashari and Umrani (2023), also highlighted the importance of improving trainings given to students and professors by focusing on promoting academic honesty and originality. In summary, it can be concluded that the results of this study generally align with existing systematic reviews.

Based on the research findings, the studies highlight possible implementation of GAI tools like ChatGPT in various aspects of English language learning and teaching. ChatGPT offers significant benefits in terms of language learning and teaching, such as providing personalized learning and feedback, fostering motivation, as well as enhancing teaching. Despite its positive outcomes for learners, teachers, and instructors, its use requires careful consideration to address potential drawbacks such as hindering creativity, ethical issues, academic integrity, cheating, plagiarism, and misinformation. In addition, implementing these tools properly into the curriculum and trainings are essential for maximizing its positive impact.

5. Conclusion

Relevant research questions were formulated in line with the aim of the study. Regarding the publication years of the selected studies, those selected were conducted in 2023 and 2024 and carried out by researchers from 18 different countries, with China having the highest number of studies, followed by Indonesia and Turkey. Concerning the broad range of journals that published articles, most publications appeared in Education and Information Technologies, and the others were published in different journals. Also, one of the reviewed studies was a conference paper. Examination of research designs and methods revealed that most of the studies employed qualitative methods, followed by mixed-methods studies, and quantitative studies, each using various designs. Having explored the learning contents of the studies, most studies did not focus on a specific learning content, while others focused on writing skills. Similarly, concerning learning domains, the findings indicated that writing is the most emphasized domain compared to other language skills. It was found that learning places showed a similar distribution, with most studies conducted in schools, and the remaining studies taking place outside of school and in both settings. In relation to the target audiences in the selected studies, it was concluded that most of the studies were conducted with participants from the university level. Based on the examination of the most used GAI tool and its roles in English language education, ChatGPT was utilized the most frequently for many purposes. Regarding data collection tools and methods, the studies used a variety of methods including interviews, observations, questionnaires, surveys, documents, and others. Sample sizes in the selected studies are varied, with mostly small to medium sizes. In terms of study duration, most of the studies lasted more than two months while others took shorter time, though in some studies duration of time was not specified. Furthermore, concerning sample selection types, it was found that most studies used purposive sampling and convenience sampling to select the participants, while the others were also used less frequently. Examination of data analysis methods showed that various methods were utilized, with thematic analysis being the most used, followed by descriptive analysis, content analysis, and other less frequently used methods. In relation to research objectives, in general terms it can be stated that studies examined the implementation of GAI tools, specifically ChatGPT, to understand its impact on or role in English language education contexts.

Lastly, with regard to the study results, it was revealed that GAI tools, specifically ChatGPT, have a positive impact on supporting English language learning and teaching. It was not aimed to examine only ChatGPT within the scope of GAI tools but the results of selected studies addressed it. This may be due to its widespread use and growing interest in recent times. It was demonstrated in the studies that these tools were used for various purposes, ranging from enhancing overall language proficiency to improving language skills when examined from learners' perspective. The studies showed that ChatGPT is considered useful to develop language skills, particularly writing and helpful to boost learners' motivation. From the teachers' perspective, it has the potential to enhance EFL teaching with its careful implementation. Despite supporting language education, some concerns related to its implementation were also highlighted in the studies.

The findings of this systematic review are expected to emphasize the changing nature of GAI-based English language learning and teaching practices by highlighting the importance of careful and appropriate implementation to optimize positive outcomes. Through examination of relevant studies on the implementation of GAI based tools like ChatGPT, this study may help gain familiarity with its potential uses and enrich relevant literature by serving as a guide for researchers and future studies in this field. As technological developments continue to shape various aspects of language education, it is important to explore the impact of the implementation of such technologies.

5.1. Implications of Research

Based on the research findings, this study proposes some recommendations for instructors, teachers, learners, educational institutions, policy makers and researchers. Instructors and teachers may benefit from the contribution of this study to support their students in the language learning process by implementing GAI-based tools that aim to enhance their language proficiency, develop their language skills, and encourage students to be active participants in their learning. In this regard, educational institutions and teachers can work together to maximize the careful and effective use of these tools while integrating them into language education, which will enhance their impact on students. Additionally, educational institutions should provide instructors and teachers with the necessary training on this topic, focusing on reducing their workload while ensuring effective guidance. Similarly, by presenting how these

tools are implemented, this study may help students have a richer language learning process. By directing researchers to relevant research studies on the implementation of GAI tools, the findings of this study may also enable researchers in their work. This may encourage researchers to conduct more research on this topic which will also contribute to relevant literature. In this regard, this may assist policy makers in revising educational policies, which will also influence the integration of these technologies into educational institutions.

Another important recommendation for researchers might be taking several factors into consideration while conducting research. The findings of this review showed that most studies focused on writing skills in relation to the implementation of these tools. Thus, more studies may be conducted to investigate the impact of GAI tools on other language skills. Likewise, while examining the literature, it was observed that studies on the implementation of these tools in English language are limited in number. Therefore, further research studies, including systematic reviews should be carried out to examine this topic in English language context. An additional recommendation concerns the diversity of GAI tools used in the studies. There is more research on the implementation of ChatGPT among GAI tools, thus, research studies exploring the effects of other GAI tools in language education might be useful. Also, since most of the studies in this review were carried out in university settings, further research should focus on exploring this topic in other educational environments such as high school and postgraduate settings. Similarly, studies should be larger and longer in terms of sample sizes and duration in comparison to the reviewed studies.

In addition, there is a lack of studies on the ethical use of ChatGPT. Therefore, more research on this topic should also be conducted. As implementation of these tools in language education continues to gain increasing interest, further studies could aid in their appropriate application, minimize potential drawbacks, and maximize benefits, thereby providing valuable support to all stakeholders, including teachers, instructors, students, policymakers, and researchers.

5.2. Limitations and Suggestion

This systematic review is limited to studies related to only the implementation of GAI tools in English language learning, excluding other languages, and includes only articles published in English before August 1, 2024.

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Appendix

No	Article's Name	Authors	References
1	Using ChatGPT in English Language Learning: A Study on I.T. Students' Attitudes, Habits, and Perceptions	Ho Pham Xuan Phuong	Phuong, H. P. X. (2024). Using ChatGPT in English Language Learning: A Study on IT Students' Attitudes, Habits, and Perceptions. *Online Submission*, *4*(1), 55-68.
2	To resist it or to embrace it? Examining ChatGPT's potential to support teacher feedback in EFL writing	Kai Guo & Deliang Wang	Guo, K., & Wang, D. (2024). To resist it or to embrace it? Examining ChatGPT's potential to support teacher feedback in EFL writing. *Education and Information Technologies*, *29*(7), 8435-8463.
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22	Examining the Impacts of ChatGPT on Student Motivation and Engagement	Sonia Alejandrina Sotelo Muñoz, Giovanna Gutiérrez Gayoso, Alberto Caceres Huambo, Rogelio Domingo Cahuana Tapia, Jorge Layme Incaluque	Muñoz, S. A. S., Gayoso, G. G., Huambo, A. C., Tapia, R. D. C., Incaluque, J. L., Aguila, O. E. P., ... & Arias-Gonzáles, J. L. (2023). Examining the impacts of ChatGPT on student motivation and engagement. *Social Space*, *23*(1), 1-27.
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