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Revolutionizing EFL learning through ChatGPT: A qualitative study

التحول السريع في تعلم اللغة الإنجليزية كلغة أجنبية عن طريق تشات جي بي تي: دراسة نوعية

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Abstract

Incorporating artificial intelligence (AI) technologies has a significant role in teaching and learning English as a Foreign Language (EFL). ChatGPT, developed by OpenAI as a conversational generative AI tool, has the potential to enhance the teaching and learning of English effectively. This study aims to explore the role of using ChatGPT in learning English among students at the University of Hail in Saudi Arabia. The results from six individual interviews and four focus group interviews revealed several contributions to students' learning. Students recognise that ChatGPT has enhanced their English language skills, such as reading, writing, grammar, and spelling. Also, it promoted self-directed learning, and facilitated effective interaction by providing personalised support and occasionally substituting the role of the teacher. Additionally, ChatGPT has improved students' research skills by facilitating brainstorming, feedback, and access to diverse resources. Students noted that ChatGPT has fostered curiosity in learning and seeking knowledge through asking questions and receiving prompt answers. However, despite the benefits, students also revealed challenges, such as over-reliance on technology and occasional inaccuracies in the information provided. These findings are particularly important in the current context of AI integration in education, where educators and students are exploring new ways to enhance learning experiences and outcomes. Also, they call for intensive training on how to effectively utilize ChatGPT in the field of teaching EFL. This study provides valuable information for teachers, administrators, and curriculum developers who aim to use AI to enhance language learning. Future research should explore the long-term effects of AI tools like ChatGPT on language retention, the integration of AI into diverse curricula and ethical implications of its use in EFL education.

Keywords: ChatGPT, Chatbot, Artificial Intelligence (AI), EFL learning, TESOL.

المخلص

تقوم تقنيات الذكاء الاصطناعي بدور مهم في تدريس اللغة الإنجليزية كلغة أجنبية. يُعتبر تشات جي بي تي، كأداة ذكاء اصطناعي مولدة للحوار، وسيلة فعالة لتعزيز تدريس اللغة الإنجليزية وتعلمها. تهدف هذه الدراسة إلى استكشاف دور استخدام تشات جي بي تي في تعلم اللغة الإنجليزية بين الطلاب في جامعة حائل بالمملكة العربية السعودية. أظهرت نتائج ست مقابلات فردية وأربع مقابلات جماعية عدة مساهمات في تعلم الطلاب. فقد أظهرت النتائج أن تشات جي بي تي قد حسّن مهارات الطلاب في اللغة الإنجليزية كالقراءة والكتابة والنحو، وعزز التعلم الذاتي، وساهم في تسهيل التفاعل الفعّال من خلال توفير دعم شخصي وأحياناً التعويض عن دور المعلم. علاوة على ذلك، حسّن تشات جي بي تي مهارات البحث لدى الطلاب من خلال تسهيل العصف الذهني، وتقديم التغذية الراجعة، والوصول إلى موارد متنوعة. أشار الطلاب إلى أن تشات جي بي تي قد عزز فضولهم في التعلم والسعي نحو المعرفة من خلال طرح الأسئلة والحصول على إجابات سريعة. ومع ذلك، ورغم الفوائد، كشف الطلاب أيضاً عن تحديات، مثل الاعتماد المفرط على التكنولوجيا ووجود بعض الأخطاء العرضية في المعلومات المقدمة. تدعو هذه النتائج إلى ضرورة توفير تدريب مكثف حول كيفية استخدام تشات جي بي تي بفعالية في مجال تدريس اللغة الإنجليزية كلغة أجنبية. تقدم هذه الدراسة معلومات قيمة للمعلمين والإداريين ومطوري المناهج الذين يهدفون إلى استخدام الذكاء الاصطناعي لتعزيز تعلم اللغات. في الختام، تبرز هذه الدراسة إمكانات أدوات الذكاء الاصطناعي مثل ChatGPT في تعزيز تعلم اللغة، مع نداعيات هامة على ممارسات التدريس والبحث المستقبلي، لا سيما في تحسين دمجها مع معالجة التحديات مثل الاعتماد المفرط والدقة.

الكلمات المفتاحية: تشات جي بي تي، درشة آلية، الذكاء الاصطناعي، تعلم اللغة الإنجليزية كلغة أجنبية.

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Introduction

English as a Foreign Language (EFL) instruction and learning have been significantly transformed by the of artificial intelligence (AI) technologies. Among these technologies, ChatGPT, a conversational generative AI tool developed by OpenAI, has emerged as a promising asset in enhancing second language acquisition (Barrot, 2024; Han, 2024; Li et al., 2024; Mosaiyebzadeh et al., 2023; Sain et al., 2024). As the field of Teaching English to Speakers of Other Languages (TESOL) continues to evolve with the constantly developing capabilities of these tools, it is crucial to explore the true potential of such AI-driven tools in supporting language learners and educators alike (Han, 2024).

The rapid advancement of AI technologies in education has opened up new possibilities for personalized learning experiences and innovative pedagogical approaches (Choi et al., 2024; Huang et al., 2023; Kuddus, 2022). With its ability to generate human-like textual input, ChatGPT offers unique opportunities for EFL students to engage in interactive language practice (Zou, Guan, et al., 2023; Zou, Reinders, et al., 2023), receive instant feedback (Muthmainnah et al., 2024; Wei, 2023), and access a wealth of information in their target language (Alshammari, 2024; Junaidi, 2020). Moreover, AI tools like ChatGPT can be effective in addressing issues like lack of confidence and fear of making mistakes, which are common challenges in EFL contexts in Saudi Arabia (Alrabai, 2016), by providing a non-judgmental, private environment for students to practice their speaking and pronunciation skills and potentially boost their self-confidence and reduce anxiety levels (Zhang et al., 2024).

While previous studies have examined the general applications of AI in language learning, there is a need for more focused research on the specific role of ChatGPT in EFL contexts (Alshumaimeri & Alshememry, 2024; Xiong, 2024). The present study aims to address this gap by exploring the experience and perceptions of students at the University of Hail in Saudi Arabia after utilizing ChatGPT in their language learning journeys. This study examines both the positive and negative aspects of using ChatGPT in an attempt to offer useful information to TESOL instructors, administrators, and curriculum developers.

The findings of this study have the potential to inform best practices for integrating AI technologies like ChatGPT into EFL programs and teaching methodologies. As the demand for effective and innovative language learning and teaching approaches continues to grow, understanding the impact of AI-driven tools becomes increasingly important for shaping the future of English language education (Edmett et al., 2023; Moybeka, 2023). This is particularly relevant in Saudi Arabia, where recent educational reforms (e.g., Saudi Vision 2030) have emphasized the importance of the importance of English language skills and the integration of technology in education (Al-Shehri, 2020). This research study contributes to the ongoing discussion about the role of AI in TESOL and offers practical implications for using these technologies to enhance language learning outcomes.

The remainder of this article is structured as follows: First, the literature review section presents the current state of research on the applications of ChatGPT in EFL education. The methodology section then details the research design, including information about the participants, data collection procedures, and the thematic analysis approach used in data analysis. Following this, the results and discussion section presents the key findings of the study and critically analyzes them considering existing research and the Saudi Arabian context. Finally, the conclusion summarizes the main insights and discusses the implications for EFL teaching and learning in Saudi Arabia and beyond, addresses the limitations of the study, and suggests directions for future research.

Literature Review

The integration of AI technologies in EFL settings has been a subject of growing interest among researchers and practitioners, mostly due to the advanced capabilities of these tools in enhancing instructional practices (Hastomo, 2024). The potential of AI technologies, specifically ChatGPT, to improve language learning outcomes and personalised learning has been investigated in recent studies. (e.g., Barrot, 2024; Han, 2024; Li et al., 2024; Pack & Maloney, 2023). A review of the relevant literature indicates that generative AI tools have shown considerable promise in providing language practice opportunities (Meniado, 2023), improving language skills (Li et al., 2024), and offering personalized learning experiences (Limo et al., 2023).

Research on the use of ChatGPT in EFL classrooms has revealed both opportunities and challenges. A study conducted at Tishk International University in Iraq demonstrated significant improvements in

grammar learning when ChatGPT was integrated into EFL classes (Kucuk, 2024). The experimental group's success rate was three times more than that of the control group, suggesting that ChatGPT could help with grammar learning. However, this study was limited to teaching grammar and did not explore other language skills and systems.

The impact of ChatGPT on student engagement and teaching efficacy has also been studied in the relevant literature. Findings suggest that ChatGPT positively influences both constructs and creates a highly engaging and personalized learning environment (Ghimire et al., 2024). Nevertheless, there are concerns about over-reliance on AI technologies, cultural and contextual misalignments perpetuated by these tools, and potential impacts on creativity and critical thinking (Hieu & Thao, 2024). In a similar vein, a recent review (Kasneci et al., 2023) argued that large language models like ChatGPT can offer considerable benefits by enhancing immersive learning experiences, improving natural language interaction, and facilitating the integration of diverse digital applications, while also listing several significant challenges linked to their use, including copyright issues, bias, overreliance, privacy, and computational costs. These concerns highlight the need for a balanced approach in integrating AI in language education.

Earlier research also indicated that the benefits offered by generative AI tools like ChatGPT may not be the same for all learners. For instance, a recent study (Wang et al., 2023) investigated how students of different learning styles interacted with an AI coach for language learning and identified key factors influencing their success. The results indicated that not all students benefitted equally from AI-supported learning. Students who actively engaged with the AI coach and adopted a deep approach to learning, which was characterized by critical thinking and reflection, achieved higher performance and experienced greater satisfaction. In contrast, those who passively followed the AI coach's instructions and focused on rote memorization struggled to integrate new knowledge and performed poorly.

The use of ChatGPT for academic studies, including in EFL education, has led to significant ethical debates. A key concern is the potential for academic dishonesty, with some arguing that using AI-generated content in academic writing constitutes a form of plagiarism, especially when authors do not acknowledge the AI tool for its contributions with proper citation (Jarrah et al., 2023). Another critical ethical challenge is the potential for AI to convey and present existing biases. As AI systems are trained on massive datasets of human-generated content that may contain societal biases, these biases can be reflected in the AI-generated content (Ray, 2023). The issue of bias in AI-generated content is particularly noteworthy in the Saudi context, where cultural sensitivities and linguistic nuances may not be sufficiently represented in ChatGPT's training data (Urman & Makhortykh, 2023)*. Privacy concerns also feature commonly in the ethical discourse surrounding AI in education. The use of AI tools often involves collecting and processing considerable amounts of students' data, which raises questions about data security and student privacy rights. These concerns are crucial for Saudi institutions where data protection regulations and cultural attitudes toward privacy differ from other contexts (Alzahrani, 2024).

Faculty perspectives on using ChatGPT in EFL classrooms reveal mixed opinions. While some professors recognize the benefits in terms of materials, resources, and enhanced time management, others express concerns about plagiarism and reduced student effort (Elsaadany, 2024). Another study that investigated into the way EFL faculty members felt about ChatGPT's efficacy in supporting student learning (Mohamed, 2023) also showed mixed feelings among professors. Although some thought ChatGPT was a useful tool for giving prompt and precise answers, others were worried that it could hinder critical thinking and reinforce biases. This divide in opinion underscores the importance of developing guidelines for effectively integrating AI tools like ChatGPT, "robust regulatory frameworks are needed that address ethical, legal and privacy issues associated in AI" (Romero, 2023, p. 7). Addressing developing policies to encourage the appropriate use of generative AI technologies by educators and students is essential for fostering ethical and innovative learning environments. Alshammri (2024) found a similar divide among Saudi students. While many appreciated ChatGPT's assistance with content structuring, feedback, and personalized support, others expressed concerns about potential academic dishonesty, overreliance on the tool, and doubts about the accuracy of AI-generated content. This divide in opinion among both teachers and learners reflects the multifaceted nature of AI integration in EFL education, where perceived benefits are often counterbalanced by ethical concerns.

* This article was corrected on October 23, 2025, by Amazonia Investiga. The correction does not affect the results or conclusions of the study.

Despite the growing body of research only two years after the release of ChatGPT, there are notable gaps in the current literature. Most studies have focused on specific aspects of language learning, such as grammar or writing, without providing a comprehensive view of ChatGPT's impact across all language skills. In addition, the long-term impacts of ChatGPT on language learning and learner autonomy have not been thoroughly studied. The ethical implications and potential biases in AI-generated content for language learning also require further investigation, particularly in diverse cultural contexts like Saudi Arabia.

The present study aims to address these gaps by exploring the holistic impact of ChatGPT of EFL teaching-learning at the University of Hail. By exploring students' experiences across various language skills and investigating both benefits and challenges, this research seeks to provide a more comprehensive understanding of ChatGPT's role in EFL education. Furthermore, the study will contribute to the ongoing discussion about best practices for integrating AI tools in language teaching and address the critical need for practical guidelines and ethical considerations in their use, with a particular focus on the unique cultural and educational context of Saudi Arabia.

Methodology

This study adopted a qualitative research approach with a case study design to explore the role of ChatGPT on EFL learning and teaching at the University of Hail. The qualitative methodology was chosen for its ability to provide rich, in-depth insight (Creswell & Poth, 2024) into the complex and multifaceted experiences of students using AI technologies for language learning. This approach allows for the exploration of nuanced perspectives, attitudes, and behaviours that may not be easily captured through quantitative methods (Allan, 2020).

The case study design was specifically selected for its ability to provide an in-depth and contextualized understanding of a phenomenon within its real setting (Yin, 2014). This approach is particularly well-suited for studying the integration of innovative technologies like ChatGPT in EFL education. Firstly, it allows for a holistic understanding of the complex interactions among technology, learners, and the educational environment. In addition, case studies are ideal for exploring why and how questions (Yin, 2014), which aligns with the aim of this study to explore how students use ChatGPT and why they perceive it as beneficial or challenging. By employing a case study design within a qualitative inquiry approach and focusing on a specific educational context, this research study aims to uncover detailed narratives and contextual characteristics that construct learners' perceptions of the benefits and challenges associated with the use of ChatGPT in EFL learning.

While this case study focuses on the University of Hail, the findings from this research can be transferred to other EFL learning contexts, particularly those with similar cultural, technological, and educational characteristics. By providing detailed accounts of the Saudi EFL context, the specific characteristics of the University of Hail, and the participants' backgrounds, this study enables readers to evaluate the similarity of their contexts to the one studied, which allows for informed judgments about the applicability of the findings to other settings. Furthermore, the insights gained from this study can serve as a foundation for developing frameworks that can be tested and refined in diverse EFL contexts and contribute to a broader understanding of AI integration in language education.

Participants

The participants in this study consisted of six female undergraduate students enrolled in the English program at the University of Hail. Each student was interviewed individually, and in addition, four focus groups were conducted, each comprising four students. These students were selected based on their voluntary and informal use of ChatGPT for their English language learning. It is important to note that the use of ChatGPT was not a formal requirement or initiative from the university but rather a personal choice made by the students to enhance their learning experience. All participants were using the free version of ChatGPT, which is accessible through email registration only, at the time of data collection, ensuring a common baseline among the group.

The selection of participants was conducted through purposeful sampling based on the initial author's observations of classrooms and frequent interactions with students as their professor. This approach allowed for the identification of students who had been actively and consistently using ChatGPT in their English

language studies. Before they participated in the study, all selected students were asked to sign informed consent forms to ensure their voluntary participation and understanding of the research process.

Data Collection

Data for this study were collected through a combination of six semi-structured individual interviews and four focus group discussions with 4 students in each. Collecting data through multiple sources allowed for both in-depth individual insights and collective insights that emerged from group interactions (Baillie, 2019). All interviews were audio-recorded to ensure accurate data capture and to facilitate thorough analysis.

All interviews were conducted in Arabic, the participants' native language, to encourage free, nuanced, and extensive expression of the participants' experiences and opinions on the use of ChatGPT for learning English, which is also supported by the relevant literature indicating that using participants' first language in qualitative studies can lead to richer and more authentic data (Temple & Young, 2004). Subsequently, the interviews were translated into English for analysis and reporting purposes. To ensure the accuracy and confirmability of the translated data, the translations were reviewed by experts in the EFL field, a practice recommended for cross-language qualitative research (Squires, 2009).

Ethical approval was obtained from the University of Hail (ethics approval number: H-2024-431) prior to data collection, to ensure compliance with the institutional research standards and protect participants' rights and well-being.

Data Analysis

The study employed thematic analysis in line with the six-phase approach developed by Braun and Clarke (2006). This method was selected due to its adaptability and efficiency in finding, analysing, and presenting patterns in qualitative data. The use of thematic analysis in this study allowed for a systematic yet flexible approach to understanding the complex experiences of students using AI tools in language learning (Nowell et al., 2017)

Through this rigorous analytical process, four main themes were generated from the data. These themes (Improving Language Skills, Enhancing Self-Learning and Personal Interaction, Developing Research Skills through Artificial Intelligence, and Fostering Curiosity and Knowledge among Students) cover the key findings regarding the role of ChatGPT in EFL teaching-learning at the University of Hail. The six phases of analysis included:

1. Familiarization with the information.
2. Producing initial codes.
3. Looking for recurring themes.
4. Analysing themes.
5. Finding and naming themes.
6. Producing the report.

Results and Discussion

Most students in individual interviews and focus groups indicated explicitly and implicitly that using AI tools contributed to their learning of EFL. Thematic analysis of the data revealed four themes that indicated enhanced learning experiences associated with ChatGPT use. The themes and some examples that indicate the role of ChatGPT in EFL learning are created by the author and presented in Table 1.

Table 1.
The main themes and coded of excerpts samples

| Themes | Total number of coded excerpts | Samples of the coded excerpts |
|--|--------------------------------|--|
| Improving Language Skills | 22 | Learning to read in English feels easier when I use chat GPT. I always ask it to give examples of reading passages, and I spend most of my free time finding and reading extra materials (Entithar). |
| Enhancing Self-Learning and Personal Interaction | 19 | One day, I did not understand a specific topic in English. I went to Chat GPT and asked it to explain the topic to me. It explained the topic thoroughly with supporting details and sources and it also presented some further interactive questions to ensure that I understood the topic clearly (Abeer). |
| Developing Research Skills through Artificial Intelligence | 14 | Sometimes when having difficulty doing my research tasks, I ask for help from Chat GPT. I ask it to suggest some effective keywords, evaluate resources critically and organise information methodically. It helps a lot with my research writing (Aishah) |
| Fostering Curiosity and Knowledge among Students | 9 | Chat GPT encouraged me to read further analytical readings on the assigned articles. As a result, I started to engage in literacy communities online. My interaction with those communities helped me discover exciting and new dimensions in their studies (Abeer) |

Theme 1: Improving Language Skills

The findings showed that ChatGPT can help students improve their English language skills, especially reading and writing skills, by providing additional practice opportunities. Three female students mentioned that they use ChatGPT to generate and read texts in their areas of interest. For example, Abeer said she uses ChatGPT to quickly find additional resources to improve her understanding of the study material. She added that this provides a faster answer to some questions she has compared to the conventional strategies she and her friends had been using before starting to use ChatGPT. In a similar vein, Aishah stated the following to demonstrate how ChatGPT changed her reading practices: “ChatGPT has changed the way I interact with texts. Thanks to it, I am now able to read and understand texts more deeply and quickly, which has significantly enhanced my reading skills.” Additionally, one also mentioned during a focus group interview that she uses ChatGPT like a tutor by asking it to correct texts just like a teacher would:

ChatGPT has helped me correct grammatical and spelling mistakes, improve my writing style, and make my writing clearer and more professional. All I need to do is finish writing a text, paste it into ChatGPT, and ask it to comment on and critique my writing. It shows me the mistakes, explains the corrections, and suggests suitable alternatives (FG4).

Two students mentioned that they use ChatGPT to enhance their speaking skills. One stated that she looks up the pronunciation of words in ChatGPT and uses the audio feature on the mobile app to learn the correct pronunciation. Another mentioned that she uses ChatGPT to find programs that help her learn and practice pronunciation in English:

The sites I used to practice correct word pronunciation were recommended by ChatGPT. These days, I use the Oxford Learner's Dictionaries, Merriam-Webster Dictionary, and Cambridge Dictionary. When I asked ChatGPT about websites that provide pronunciations in different accents, it suggested these excellent sites, and I rely on them for accurate pronunciation (Entithar).

Moreover, Amani said she talks with ChatGPT as if it were a real person. She uses it as a written and spoken conversation tool instead of speaking with people she cannot find to practice the language with. Abeer supported this by stating that ChatGPT has boosted her confidence in conversations. She spends a lot of time chatting with ChatGPT, which has enhanced her practice and communication skills and helped her speak English fluently without hesitation.

Similar remarks were also made in one of the focus group interviews:

ChatGPT is an informal and safe environment that allows us to practice the language without fear of making mistakes. Unlike with a teacher, when we need to ask a teacher a question, it must be well-structured and correctly phrased, but with ChatGPT, the phrasing of the question doesn't matter as much. It understands and responds even if there are mistakes in the question. Sometimes it asks if you mean this or that, and we really like that (FG1).

The use of ChatGPT for speaking practice reflects the Interaction Hypothesis, which posits that language acquisition occurs through meaningful interaction (Long, 1981). By simulating conversations, ChatGPT provides a low-stakes environment for students to engage in language production, which helps lower their affective filter and increase their willingness to communicate.

Lastly, two students mentioned that they use ChatGPT to expand their vocabulary. They said they can request definitions of new words to understand them correctly and sometimes ask for examples of new words and their use in sentences to learn how to use them correctly. Athwa mentioned she uses ChatGPT to enhance spelling as a spell checker. She said that in the past, she paid for and used Grammarly, but now it's easier with ChatGPT. She pastes the written text and asks ChatGPT to check if it is correct. Four students mentioned that ChatGPT has helped enhance their grammar skills through grammar training. They said they can ask questions about English grammar and receive detailed explanations:

Each of us faces difficulty using different tenses in English. I used ChatGPT to ask questions about grammar and practice exercises. I noticed a significant improvement in my understanding of tenses compared to before, which has increased my motivation and commitment to practising the language regularly (Amal).

Theme 2: Enhancing Self-Learning and Personal Interaction

The analysis of the data also revealed that ChatGPT encourages participants' self-learning endeavours by offering personal interaction opportunities. Four students mentioned that they use ChatGPT frequently outside of traditional class times, which has helped them identify their learning needs and start working towards meeting them. They also noted that ChatGPT has enhanced their self-learning, as they no longer need help from the teacher for language learning outside of regular class hours and have become more independent and proactive in their studies:

ChatGPT has become my personal tutor. I can ask it any question about anything I don't understand. It explains things in detail, and if I write "I don't understand that" it provides a more precise explanation until I get it (Athwa).

Similarly, one mentioned that ChatGPT provides individual support and can adapt to students' needs, helping them address their specific weaknesses. Four students in one of the focus groups noted that ChatGPT has made learning more enjoyable and motivating, increasing their engagement:

The games and educational activities that we can design and develop ChatGPT have considerably increased our motivation. I can design language games like puzzles and linguistic challenges and play them with my classmates, making learning more fun for us. We really enjoy using ChatGPT to learn English (FG3).

In a similar comment, Amani mentioned that her interaction with ChatGPT made her more competent as a self-directed learner:

The interactive nature of ChatGPT can make learning more engaging and less intimidating than traditional methods. I have a great time sitting at home writing to ChatGPT, which responds, explains, and clarifies. My motivation to learn has truly increased, and I am trying to learn more about grammar and its uses.

Two students mentioned that ChatGPT has enhanced their self-learning by breaking down the fear and shyness of asking questions in class, as they can ask questions in a non-formal setting anytime and anywhere. One group of students noted that ChatGPT is suitable for all levels of learners because it can adapt its responses according to different levels. Regarding increased student engagement with ChatGPT, one student mentioned that she creates stories in English and then posts them to ChatGPT for review and correction. ChatGPT corrects and critiques the stories, highlighting their strengths and weaknesses. Two

students mentioned that they translate texts from their native language to English using ChatGPT without consulting the teacher, which enhances their understanding of the language quickly and easily.

Previously, I used Google Translate to translate some words and texts, but I didn't really understand them, or a large number of extremely basic linguistic errors were present. Sometimes it would write the same word but in Arabic letters. Now, with ChatGPT, translation is very enjoyable, easy, and clear, and I can also ask for more explanations when I am not sure (FG4).

Based on students' remarks, ChatGPT has also provided support for independent learning at their own pace and capabilities. One student mentioned that she spends a lot of time outside of class working with ChatGPT because she feels her educational level needs additional support in learning English as a foreign language, and she needs to develop it personally and flexibly according to her educational needs.

The participants' experiences in terms of self-learning and personal interaction strongly connect to the concept of learner autonomy in language education, where students take charge of their own learning process. The personalized support offered by ChatGPT aligns with Vygotsky's Zone of Proximal Development theory, which suggests offering scaffolding tailored to individual student needs so that learners can progress beyond their existing skills with support from a more knowledgeable other (Cai et al., 2024).

While ChatGPT has clearly enhanced English language learning experiences, students have encountered several challenges that need careful consideration. These difficulties primarily revolve around issues of accuracy and over-reliance on technology, potentially impacting the overall learning process and social aspects of education.

One significant concern raised by students is the occasional inaccuracy or incompleteness of information provided by ChatGPT. This issue was reported by three participants, who expressed difficulty in comprehending some of the AI-generated responses and explanations. Such instances often require additional support or clarification from external sources, as Athwa described: "Sometimes the information provided by ChatGPT is inaccurate or incomplete. What I do is to copy the information ChatGPT gives me and paste it into Google Search to verify it". This practice of cross-reference highlights the importance of critical thinking and information literacy skills when engaging with AI-generated content.

Another challenge that emerged from the study is the potential for over-reliance on technology. Students reported a growing dependence on ChatGPT, which may reduce opportunities for peer collaboration, idea exchange, and seeking help from human sources. One participant specifically noted that this dependence has led to a perceived decline in her social communication skills. The individual nature of interaction with ChatGPT, while beneficial for personalized learning, may reduce valuable face-to-face interactions and collaborative learning experiences that are crucial for language learning and social skill development.

Theme 3: Developing Research Skills through Artificial Intelligence

The data analysis also revealed that ChatGPT significantly enhanced participants' research abilities. Four students noted that ChatGPT is a useful tool that has developed their research skills through brainstorming. Amani said: "Whenever I am unsure about what topic to write about, I ask ChatGPT to brainstorm with me, elaborate on my ideas, and help me get started. Sometimes I get stuck and don't know how or where to begin". Three students mentioned that ChatGPT helped them search for information and provided quick and accurate answers, which improved their skills in gathering information on a specific topic they wanted to research. Additionally, one student mentioned that ChatGPT was successful in providing a mind map of a specific topic when gathering information about it. A group of students also noted another advantage of ChatGPT as it fostered their creativity, especially in cases where they were asked to choose the topic of the writing task themselves. They would ask ChatGPT about some topics, and it would provide several ideas from which the student could choose and complete the task:

If I am confused about choosing a topic to write a story or an article about, I go to ChatGPT and tell it my interests, such as friendship or daily routines, and it gives me several topics to choose from. I indeed find suitable options from its suggestions and quickly write about them to complete my tasks more efficiently (FG2).

The data from the students also indicated that ChatGPT is a successful tool for providing additional sources for research. Two students mentioned that the premium edition of ChatGPT helped them gather information from various sources, such as books, academic articles, databases, and reliable websites. Amal noted: "ChatGPT premium not only provides me with scientific sources for research but also allows me to check if these sources are reliable by verifying the accuracy and objectivity of the data".

ChatGPT also helped students organize and sequence their ideas in research writing. Two students stated that ChatGPT organizes their ideas logically, classifies them by importance, and helps in arranging them systematically to clarify the logical sequence. Two students also noted that ChatGPT assisted them in refining the content by reviewing texts and providing feedback on how to revise and correct them. One group of students mentioned that ChatGPT facilitated analytical writing practice. They stated that they request help in writing reports and articles by asking ChatGPT for reviews and critiques of these texts:

Sometimes I write articles or short reports on specific topics and then ask ChatGPT to review the text and provide feedback on how to improve the style, structure, or argument presented. I receive immediate comments on my language use, which enhances my correct use of language (FG1).

A positive contribution of using ChatGPT for students is its feature of providing immediate feedback. Two students mentioned that ChatGPT's effective immediate feedback feature helped them correct grammatical and linguistic errors promptly, which reduced their anxiety and increased their confidence by continuously learning from their mistakes when using ChatGPT for this purpose. ChatGPT also assisted students with time management skills. One student mentioned that they asked ChatGPT for advice on how to effectively organize the time when writing an essay or research paper, and it helped them allocate time and tasks in a clear and organized manner. In this theme, it was repeatedly mentioned by most students that ChatGPT enhanced their research skills by suggesting additional questions. When ChatGPT asks additional questions that might be important for improving research and deepening the understanding of the topic, it helps in elaborating on the subjects and broadening perspectives.

Theme 4: Fostering Curiosity and Knowledge among Students

Finally, the analysis revealed that ChatGPT enhanced students' curiosity in learning English. Three students indicated that asking open-ended questions to ChatGPT helps practice the language by exploring various aspects of a topic. They noted that open-ended questions are used to request an analysis of a particular topic, leading ChatGPT to provide detailed information that the student then researches further, which nurtures their curiosity. In this line, Abeer stated the following:

ChatGPT has given me a deeper desire and hunger to search for information. When it provides me with specific information, I don't just stop there; I search and search more for additional details. It has allowed me to delve deeper into learning English compared to traditional methods.

ChatGPT also helped stimulate active thinking among the participants. One student mentioned that she didn't just learn English as a language but also researched other topics, such as social or political issues, in English to extend her sociocultural knowledge from various angles. Two students mentioned that they became more competent at analysing different perspectives using ChatGPT. Aishah said: "I often ask ChatGPT to provide different viewpoints on a particular topic, and then I compile and compare those viewpoints, discussing and analysing the similarities and differences between them." Another student mentioned that when asking ChatGPT to correct grammatical and linguistic errors in her writing, she seeks to understand the reasons behind the corrections to improve her writing skills more broadly. Additionally, the students' data showed that ChatGPT enhanced curiosity through dynamic interaction. One student noted that ChatGPT encouraged discussions and learning more to obtain additional information. Amani said that ChatGPT stimulated her curiosity by presenting challenging questions and language problems in learning English. She mentioned: "When using ChatGPT, I challenge myself by responding to discussion questions it presents on a certain topic. It then responds with another question, and I answer that, and it continues in this way." Similarly, one student said that ChatGPT provides ongoing support and encouragement during interactions, similar to a teacher. It offers continuous motivational phrases, which gave her greater confidence in communicating with it.

Overall, the analysis showed that students' enhanced curiosity in learning which emerged as their interaction with ChatGPT encouraged them to explore various topics and perspectives resonates strongly

with incidental learning in language acquisition, where learners acquire language skills while engaging with content that interests them (Rodgers, 2015).

Discussion

This study explored the role of ChatGPT in EFL learning at the University of Hail and revealed both significant benefits and notable challenges. The results add to the growing body of research on AI integration in language learning and provide information that can guide TESOL practices and future studies.

The improvement of language skills emerged as a primary benefit of ChatGPT use, which aligns with earlier research that highlights AI's potential to enhance language learning outcomes (Barrot, 2024; Han, 2024). Particularly noteworthy is the tool's ability to support multiple language skills simultaneously. The students' experiences with ChatGPT for reading comprehension, writing feedback, and vocabulary expansion demonstrate its versatility in supporting diverse aspects of language acquisition, which addresses a gap identified in earlier research (e.g., Kucuk, 2024) that often focused on language skills or systems in isolation. Moreover, this multifaceted support aligns with the findings of Choi et al. (2024) and Huang et al. (2023), both of whom emphasized AI's capacity to offer personalized learning experiences across various language domains. In this context, educators should consider incorporating AI tools like ChatGPT into their teaching practices for providing additional practice opportunities and personalized feedback.

The theme of enhanced self-learning and personal interaction reflects AI's potential to foster learner autonomy, a crucial aspect often emphasized in TESOL literature (Kuddus, 2022; Zou, Reinders, et al., 2023). The students' reported increase in independence and proactive learning behaviours suggests that ChatGPT may serve as a catalyst for self-directed learning and address the need for more personalized and adaptive learning experiences in EFL contexts. However, this finding also raises questions about the optimal balance between AI-assisted learning and traditional classroom interactions, echoing concerns raised by Kasneci et al. (2023) about the potential over-reliance on technology in instructional settings. Therefore, while creating opportunities for the benefits of AI, it is crucial to maintain opportunities for peer collaboration and teacher-student interaction to ensure holistic language development. Curriculum design can play a critical role in ensuring this balance by offering guidance on how to effectively use AI tools for self-directed learning in order to empower students to take control of their language journey without over-relying on tools.

The development of research skills through AI interaction represents a novel finding that extends beyond typical language learning outcomes. This aspect of ChatGPT use aligns with broader educational goals of fostering critical thinking and information literacy skills, as emphasized by Wang et al. (2023). The tool's ability to assist with brainstorming, data gathering, and analytical writing suggests potential applications beyond language learning, possibly contributing to academic skills development across disciplines. Given these benefits, teaching materials should be designed to encourage students to critically evaluate AI-generated content to enhance critical thinking skills, language skills, and digital literacy skills at the same time.

The theme of fostering curiosity and knowledge among students highlights ChatGPT's emerging role in promoting deeper engagement with learning materials and broader academic topics. This finding resonates with the work of Muthmainnah et al. (2024) and Wei (2023), who emphasized the importance of AI in creating more engaging and motivating learning environments. However, it also underscores the need for careful integration of AI tools to ensure they complement rather than replace human-led instruction and peer interaction.

Despite these positive outcomes, the challenges identified in this study, particularly regarding information accuracy and potential over-reliance on AI, echo concerns also raised in previous research (e.g., Ghimire et al., 2024; Hieu & Thao, 2024). These findings highlight the critical need for developing comprehensive guidelines and ethical frameworks for AI use in EFL contexts, as suggested by Elsaadany (2024) and Mohamed (2023). Furthermore, the concerns about reduced social interaction and collaborative learning opportunities point to the importance of maintaining a balanced approach that integrates AI tools while preserving valuable face-to-face interactions in language learning environments. Teaching materials that include discussions on the ethical use of AI in academic contexts could also be valuable in addressing key issues such as plagiarism and over-reliance on technology.

Finally, the analysis showed that the benefits introduced under the four themes are interconnected in that they can reinforce each other. To illustrate, as students gain confidence in their language abilities through ChatGPT-assisted practice, they become more motivated to engage in independent learning activities (e.g., increased reading comprehension skills may encourage students to explore more complex materials autonomously). As students become more autonomous learners, they become better able to utilize ChatGPT for research purposes through its capabilities such as organizing ideas and analyzing different perspectives on a topic. Moreover, the development of research skills is closely linked to fostering curiosity. As students learn to use ChatGPT for brainstorming and information gathering, they naturally become more curious about various topics. This curiosity, in turn, drives them to further develop research skills and create a positive feedback loop of learning and exploration.

Conclusions

In conclusion, the current study adds to the ongoing debate over the function of generative AI tools in TESOL by offering a sophisticated perspective on the function of ChatGPT, the most popular generative AI tool, in EFL instruction. The findings of the present study are novel in several aspects, particularly in revealing the multifaceted role of ChatGPT in EFL learning. They showed that students obtained benefits not only in language skills development but also through the enhancement of autonomous learning, research skills, and curiosity among students. This holistic view of AI's role in language learning represents a significant contribution to the field of research in TESOL.

According to the results, even if ChatGPT has a lot to offer in terms of improving language proficiency and learner autonomy, integrating it into EFL programmes requires careful management to handle issues and ethical concerns. Future investigations ought to concentrate on identifying and developing best practices for AI integration in EFL, exploring long-term effects on language learning, and investigating strategies to mitigate potential negative impacts on social learning aspects. As AI tools continue to evolve, ongoing assessment and adaptation of their use in language education will be crucial to ensure it enhances rather than diminishes the quality of EFL learning and teaching and students' relevant experiences. In addition, future research should aim to present the perspectives of multiple stakeholders (i.e., students, teachers, educational leaders) together and in relation to each other, which is necessary for developing a comprehensive and holistic view of the challenges and benefits associated with AI use in instructional settings for language learning. In a similar vein, comparative studies across different cultural and educational contexts could provide a more comprehensive understanding of how AI tools can be effectively integrated into diverse EFL settings. Lastly, longitudinal studies that adopt mixed-methods approaches could be helpful in ensuring depth and breadth in evaluating the long-term role of AI integration in language learning and learner autonomy.

The findings of this study have significant implications for various stakeholders in the TESOL field. For educators, the findings underscore the need to develop new pedagogical approaches that effectively integrate AI tools like ChatGPT into their teaching practices while maintaining a balance with conventional approaches. This may involve redesigning teaching programs to incorporate AI-enhanced learning activities and developing strategies to benefit from ChatGPT's strengths in personalized feedback and generating practice activities. For administrators and policymakers, the study emphasises how crucial it is to create precise regulations and ethical guidelines for the use of AI in language instruction, considering concerns like data privacy, academic integrity, and fair access. Additionally, there is a need for professional development programs to equip teachers with the skills necessary to effectively utilize and critically evaluate AI tools in their classrooms. For students, the findings emphasize the potential of AI as a powerful learning assistant, but also the importance of developing critical thinking skills to navigate and verify AI-generated information.

A key limitation of this study is the gender-specific nature of the participant group, which consisted solely of female students. This limitation arose from national regulations that restricted the female researcher's ability to interact with male students due to the gender segregation policy in the research setting. Consequently, the findings may not fully represent the experiences and perspectives of male EFL learners. This gender-specific data collection could overlook potential differences in AI usage, learning preferences, and challenges that may exist between male and female students in EFL contexts. Additionally, the study's focus on a single institution, the University of Hail, may limit the relevance of findings to other educational settings with different cultural, technological, and pedagogical contexts. In this regard, future studies should

try to incorporate a more varied participant pool from different institutions and genders in order to give a deeper understanding of ChatGPT's impact on EFL instruction.

Bibliographic references

- Allan, G. (2020). Qualitative Research. In G. Allan & C. Skinner (Eds.), *Handbook for Research Students in the Social Sciences* (pp. 177–189). Routledge. <https://doi.org/10.4324/9781003070993-18>
- Alrabai, F. (2016). Factors Underlying Low Achievement of Saudi EFL Learners. *International Journal of English Linguistics*, 6(3), Article 3. <https://doi.org/10.5539/ijel.v6n3p21>
- Al-Shehri, S. (2020). Transforming English Language Education in Saudi Arabia: Why Does Technology Matter?. *International Journal of Emerging Technologies in Learning (iJET)*, 15(6), 108-123.
- Alshammari, A. (2024). ChatGPT in English writing: experiences and perceptions of Saudi EFL students. *Amazonia Investiga*, 13(78), 47-57. <https://doi.org/10.34069/AI/2024.78.06.4>
- Alshumaimeri, Y. A., & Alshememry, A. K. (2024). The Extent of AI Applications in EFL Learning and Teaching. *IEEE Transactions on Learning Technologies*, 17, 653–663. <https://doi.org/10.1109/TLT.2023.3322128>
- Alzahrani, R. B. (2024). An Overview of AI Data Protection in the Context of Saudi Arabia. *International Journal for Scientific Research*, 3(3). <https://doi.org/10.59992/IJSR.2024.v3n3p8>
- Baillie, L. (2019). Exchanging focus groups for individual interviews when collecting qualitative data. *Nurse Researcher*, 27(2), 15-20. <https://doi.org/10.7748/nr.2019.e1633>
- Barrot, J. S. (2024). ChatGPT as a Language Learning Tool: An Emerging Technology Report. *Technology, Knowledge and Learning*, 29(2), 1151–1156. <https://doi.org/10.1007/s10758-023-09711-4>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology Virginia. *Qualitative Research in Psychology*, 2(3), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Cai, L., Msafiri, M. M., & Kangwa, D. (2024). Exploring the impact of integrating AI tools in higher education using the Zone of Proximal Development. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-024-13112-0>
- Choi, J.-I., Yang, E., & Goo, E.-H. (2024). The Effects of an Ethics Education Program on Artificial Intelligence among Middle School Students: Analysis of Perception and Attitude Changes. *Applied Sciences*, 14(4), Article 4. <https://doi.org/10.3390/app14041588>
- Creswell, J. W., & Poth, C. N. (2024). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications. <https://uk.sagepub.com/en-gb/eur/qualitative-inquiry-and-research-design/book266033>
- Edmett, A., Ichaporia, N., Crompton, H., & Crichton, R. (2023). *Artificial intelligence and English language teaching: Preparing for the future*. British Council.
- Elsaadany, M. (2024). Usage of Chat GPT in English as a Foreign Language (EFL) Classrooms: Faculty Member's Perspective for its Challenges and Opportunities. *Journal of the Faculty of Arts, Fayoum University*, 16(2), 338–356. <https://doi.org/10.21608/jfafu.2024.280282.2034>
- Ghimire, P. R., Neupane, B. P., & Dahal, N. (2024). Generative AI and AI Tools in English Language Teaching and Learning: An Exploratory Research. *English Language Teaching Perspectives*, 9(1–2), 30–40. <https://doi.org/10.3126/eltp.v9i1-2.68716>
- Han, Z. (2024). Chatgpt in and for second language acquisition: A call for systematic research. *Studies in Second Language Acquisition*, 46(2), 301–306. <https://doi.org/10.1017/S0272263124000111>
- Hastomo, T. (2024). Scrutinizing Indonesian pre-service teachers' technological knowledge in utilizing ai-powered tools. *Journal of Education and Learning (Edulearn)*, 18(4), 1572-1581. <https://doi.org/10.11591/edulearn.v18i4.21644>
- Hieu, H. H., & Thao, L. T. (2024). Exploring the Impact of AI in Language Education: Vietnamese EFL Teachers' Views on Using ChatGPT for Fairy Tale Retelling Tasks. *International Journal of Learning, Teaching and Educational Research*, 23(3), 486–503. <https://doi.org/10.26803/ijlter.23.3.24>
- Huang, A. Y. Q., Lu, O. H. T., & Yang, S. J. H. (2023). Effects of artificial Intelligence-Enabled personalized recommendations on learners' learning engagement, motivation, and outcomes in a flipped classroom. *Computers & Education*, 194, 104684. <https://doi.org/10.1016/j.compedu.2022.104684>
- Jarrah, A. M., Wardat, Y., & Fidalgo, P. (2023). Using ChatGPT in academic writing is (not) a form of plagiarism: What does the literature say? *Online Journal of Communication and Media Technologies*, 13(4), e202346. <https://doi.org/10.30935/ojcm/13572>
- Junaidi, J. (2020). Artificial intelligence in EFL context: rising students' speaking performance with Lyra virtual assistance. *International Journal of Advanced Science and Technology Rehabilitation*, 29(5), 6735–6741.

- Kasneji, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., ... Kasneji, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Kucuk, T. (2024). ChatGPT Integrated Grammar Teaching and Learning in EFL Classes: A Study on Tishk International University Students in Erbil, Iraq. *Arab World English Journal, 1*(1), 100–111. <https://doi.org/10.24093/awej/chatgpt.6>
- Kuddus, K. (2022). Artificial Intelligence in Language Learning: Practices and Prospects. In *Advanced Analytics and Deep Learning Models* (pp. 1–17). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119792437.ch1>
- Li, B., Lowell, V. L., Wang, C., & Li, X. (2024). A systematic review of the first year of publications on ChatGPT and language education: Examining research on ChatGPT's use in language learning and teaching. *Computers and Education: Artificial Intelligence, 7*, 100266. <https://doi.org/10.1016/j.caeai.2024.100266>
- Limo, F. A. F., Tiza, D. R. H., Roque, M. M., Herrera, E. E., Murillo, J. P. M., Huallpa, J. J., Flores, V. A. A., Castillo, A. G. R., Peña, P. F. P., Carranza, C. P. M., & Gonzáles, J. L. A. (2023). Personalized tutoring: ChatGPT as a virtual tutor for personalized learning experiences. *Social Space, 23*(1), 293–312.
- Long, M. H. (1981). Input, Interaction, and Second-Language Acquisition. *Annals of the New York Academy of Sciences, 379*(1), 259–278. <https://doi.org/10.1111/j.1749-6632.1981.tb42014.x>
- Meniado, J. C. (2023). The Impact of ChatGPT on English Language Teaching, Learning, and Assessment: A Rapid Review of Literature. *Arab World English Journal, 14*(4), 3–18. <https://doi.org/10.24093/awej/vol14no4.1>
- Mohamed, A. M. (2023). Exploring the potential of an AI-based Chatbot (ChatGPT) in enhancing English as a Foreign Language (EFL) teaching: Perceptions of EFL Faculty Members. *Education and Information Technologies, 29*(3), 3195–3217. <https://doi.org/10.1007/s10639-023-11917-z>
- Mosaiyebzadeh, F., Pouriyeh, S., Parizi, R., Dehbozorgi, N., Dorodchi, M., & Macêdo Batista, D. (2023). Exploring the Role of ChatGPT in Education: Applications and Challenges. *Proceedings of the 24th Annual Conference on Information Technology Education, 84–89*. <https://doi.org/10.1145/3585059.3611445>
- Moybeka, A. (2023). Artificial intelligence and english classroom: the implications of ai toward efl students' motivation. *Edumaspul - Journal of Education, 7*(2), 2444–2454. <https://doi.org/10.33487/edumaspul.v7i2.6669>
- Muthmainnah, M., Cardoso, L., Alsbbagh, Y. A. M. R., Al Yakin, A., & Apriani, E. (2024). Advancing Sustainable Learning by Boosting Student Self-regulated Learning and Feedback Through AI-Driven Personalized in EFL Education. In A. Alnoor, M. Camilleri, H. A. Al-Abrow, M. Valeri, G. E. Bayram, & Y. R. Muhsen (Eds.), *Explainable Artificial Intelligence in the Digital Sustainability Administration* (pp. 36–54). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-63717-9_3
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods, 16*, 1–13. <https://doi.org/10.1177/1609406917733847>
- Pack, A., & Maloney, J. (2023). Using Generative Artificial Intelligence for Language Education Research: Insights from Using OpenAI's ChatGPT. *TESOL Quarterly, 57*(4), 1571–1582. <https://doi.org/10.1002/tesq.3253>
- Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems, 3*, 121–154. <https://doi.org/10.1016/j.iotcps.2023.04.003>
- Rodgers, D. M. (2015). Incidental Language Learning in Foreign Language Content Courses. *The Modern Language Journal, 99*(1), 113–136. <https://doi.org/10.1111/modl.12194>
- Sain, Z. H., Ikhwan, A., & Serban, R. (2024). Exploring the Role of ChatGPT in Education: A Study on AI-Driven Instruction and Learning. *Asian Review of Social Sciences, 13*(1), 32–38. <https://doi.org/10.70112/arss-2024.13.1.4237>
- Squires, A. (2009). Methodological challenges in cross-language qualitative research: A research review. *International Journal of Nursing Studies, 46*(2), 277–287. <https://doi.org/10.1016/j.ijnurstu.2008.08.006>
- Temple, B., & Young, A. (2004). Qualitative Research and Translation Dilemmas. *Qualitative Research, 4*(2), 161–178. <https://doi.org/10.1177/1468794104044430>

- Urman, A., & Makhortykh, M. (2023). *The Silence of the LLMs: Cross-Lingual Analysis of Political Bias and False Information Prevalence in ChatGPT, Google Bard, and Bing Chat*. OSF. <https://doi.org/10.31219/osf.io/q9v8f>
- Vergara-Romero, A. (2023). Challenges and stakes of artificial intelligence in economic sciences. *Amazonia Investiga*, 12(64), 7-8. <https://doi.org/10.34069/AI/2023.64.04.0>
- Wang, X., Liu, Q., Pang, H., Tan, S. C., Lei, J., Wallace, M. P., & Li, L. (2023). What matters in AI-supported learning: A study of human-AI interactions in language learning using cluster analysis and epistemic network analysis. *Computers & Education*, 194, 104703. <https://doi.org/10.1016/j.compedu.2022.104703>
- Wei, L. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*, 14. <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1261955>
- Xiong, Y. (2024). A Review of the Features and Efficacy of Chat-GPT AI Writing Assistant in Influencing EFL Learners' English Writing Skills. *Transactions on Social Science, Education and Humanities Research*, 11, 177–183. <https://doi.org/10.62051/bxz3th29>
- Yin, R. (2014). *Case study research: Design and methods*. SAGE Publications.
- Zhang, C., Meng, Y., & Ma, X. (2024). Artificial intelligence in EFL speaking: Impact on enjoyment, anxiety, and willingness to communicate. *System*, 121, 103259. <https://doi.org/10.1016/j.system.2024.103259>
- Zou, B., Guan, X., Shao, Y., & Chen, P. (2023). Supporting Speaking Practice by Social Network-Based Interaction in Artificial Intelligence (AI)-Assisted Language Learning. *Sustainability*, 15(4), Article 4. <https://doi.org/10.3390/su15042872>
- Zou, B., Reinders, H., Thomas, M., & Barr, D. (2023). Editorial: Using artificial intelligence technology for language learning. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1287667>