Effectiveness of ChatGPT in Improving Academic Writing Among EFL Libyan Tertiary Female Learners

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Abstract

This study investigates the effectiveness of ChatGPT in enhancing English academic writing skills among 17 female students from the English Language Department, Faculty of Arts, at Al-Asmarya Islamic University in Zliten, Libya. All participants were in their fourth semester and enrolled in the "Writing 4" course, which focuses on academic essay writing. The study also aims to explore students' perceptions and experiences in using ChatGPT as a writing tool. A mixed-methods research design was adopted, combining both quantitative and qualitative approaches. Quantitative data were collected through pre- and post- writing tests which were analyzed statistically using SPSS version 21. Qualitative data were gathered through semi-structured interviews which were analyzed using thematic analysis. The results revealed a statistically significant improvement in students' writing performance following the use of ChatGPT, suggesting the tool provided effective and personalized support. Additionally, participants expressed positive perceptions regarding ChatGPT, noting its role in idea generation, vocabulary enhancement, and increased writing confidence. An important implication is that the potential for integrating ChatGPT into writing instruction in Libyan higher education, where it can foster learner autonomy, improve academic writing outcomes, and offer valuable assistance in resource-limited educational settings.

فعالية شات جي بي تي في تحسين الكتابة الأكاديمية لدى الطالبات الليبيات الدارسات للغة الإنجليزية

كلغة أجنبية في المرحلة الجامعية

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الملخّص

تتناول هذه الدراسة فعالية استخدام ChatGPT في تحسين مهارات الكتابة الأكاديمية باللغة الإنجليزية لدى 17 طالبة من قسم اللغة الإنجليزية، كلية الآداب، بجامعة الأسمرية الإسلامية في زليتن، ليبيا. كانت جميع المشاركات في الفصل الدراسي الرابع وملتحقات بمقرر "الكتابة 4"، الذي يركز على كتابة المقالات الأكاديمية. كما تهدف الدراسة إلى استكشاف تصورات الطالبات وتجاربهن في استخدام ChatGPT كأداة للكتابة. تم اعتماد تصميم بحثي متعدد المنهج، يجمع بين الأساليب الكمية والنوعية. تم جمع البيانات الكمية من خلال اختبارات كتابة قبلية وبعدية، وتم تحليلها إحصائيًا باستخدام برنامج SPSS الإصدار 21. أما البيانات النوعية، فتم جمعها من خلال مقابلات شبه منظمة، وتم تحليلها باستخدام التحليل الموضوعي. أظهرت النتائج تحسنًا ملحوظًا من الناحية الإحصائية في أداء الطالبات في الكتابة بعد استخدام ChatGPT، مما يشير إلى أن الأداة قدمت دعمًا فعالًا وشخصيًا. بالإضافة إلى ذلك، عبّرت المشاركات عن تصورات إيجابية تجاه ChatGPT، مشيرات إلى دوره في توليد الأفكار، وتعزيز المفردات، وزيادة الثقة في الكتابة. ومن النتائج المهمة أن دمج ChatGPT في تعليم الكتابة في التعليم العالي الليبي يحمل إمكانيات واعدة، حيث يمكن أن يعزز استقلالية المتعلم، ويحسن نتائج الكتابة الأكاديمية، ويقدم دعمًا قيمًا في البيئات التعليمية ذات الموارد المحدودة.

Introduction

In today's educational landscape, technology is essential, particularly in language learning, by offering innovative opportunities to both teachers and students. The integration of digital tools such as computers, the internet, and multimedia resources significantly enhances the learning experience by granting access to authentic materials, promoting interactive engagement, and encouraging learner autonomy (Ghwela, 2023). In addition, Ghwela (2023) emphasizes that in the

context of education, technology provides educators with an opportunity to create learner-centred environments where students are empowered to develop problem-solving skills and become more independent in their learning processes, rather than relying solely on traditional teaching methods. By providing diverse resources and enabling meaningful language practice, technology facilitates cultural understanding, real-world application, and individualized learning pathways. As educational practices advance, embedding technology into teaching not only raises the quality of education but also prepares students with the digital competencies essential for thriving in a globally connected environment.

The incorporation of artificial intelligence into language education has transformed traditional educational paradigms, particularly in English writing proficiency. Research highlights that technology helps overcome common obstacles in language learning, such as time constraints in writing tasks (Wang, 2022; Rahimi & Fathi, 2022). AI-powered tools particularly ChatGPT offer automated feedback on organization, vocabulary , grammar, and coherence, enabling users to enhance their writing proficiency (Zhao, 2022; Salvagno et al., 2023). Furthermore, AI fosters an interactive and engaging learning environment by addressing challenges in traditional teaching methods and encouraging lifelong learning skills (Jia et al., 2022). While AI tools open new opportunities in academic writing (Osorio, 2023), they also present challenges, requiring educators to balance technology integration with critical thinking and creativity (Abolkasim & Shtewi, 2023).

Academic writing is essential for enhancing the language proficiency of English learners, as it demands mastery in organizing ideas, ensuring coherence, and applying accurate grammar and vocabulary. (Campbell, 2019). This type of writing is very important in education because it helps readers learn, critique, and build on new knowledge. With the development of new technologies like ChatGPT, writing academically has become much easier for students. Generative AI tools provide valuable assistance throughout the academic writing process, supporting tasks like brainstorming research ideas and questions, as well as refining drafts through grammar corrections, proofreading, and editing (Dale & Viethen, 2021;

Rowland, 2023). ChatGPT is an advanced tool that aids in idea generation, essay organization, and language improvement. These AI-powered writing tools deliver automated suggestions to enhance writing quality by improving structure, clarity, grammar, and vocabulary, thereby helping users achieve better overall performance in their writing tasks (Salvagno et al., 2023; Zhao, 2022). They also correct grammar mistakes, offer suggestions for better writing, and simplify complex topics, making writing less stressful and more productive. Montenegro-Rueda et al. (2023) highlighted the growing interest in ChatGPT within educational contexts, attributing its popularity to its capacity to enhance student learning and support academic development. By using ChatGPT, students can focus more on their own ideas while still meeting the demands of academic work. ChatGPT's ease of use and helpfulness has made it an essential tool for students working on academic writing.

Problem Statement

Mastering academic writing presents a considerable challenge for English as a Foreign Language (EFL) learners, especially among Libyan tertiary students (Ashour & Fatima, 2016). Many Libyan EFL learners struggle with structuring their essays, maintaining clarity and coherence across paragraphs, and using the correct academic tone. This skill is crucial for academic success and global communication, yet traditional teaching methods, which often emphasize memorization and rule-based instruction rather than practical application, do not adequately address individual students' needs (Imaniah, 2022). In the current digital era, artificial intelligence (AI) stands as a transformative force across numerous domains, notably education. By enabling personalized and adaptable learning experiences, AI enhances both the effectiveness and efficiency of teaching and learning (Al-Qahtani, 2016). Within this context, AI tools like ChatGPT have emerged as innovative solutions to enhance learning by providing personalized assistance and feedback. ChatGPT's potential to act as a virtual tutor could offer substantial support in developing academic writing skills by refining students' arguments, improving essay structure, and adopting an academic tone (Montenegro-Rueda et al., 2023).

Although AI tools are increasingly utilized in educational environments, empirical studies

assessing their impact within the Libyan EFL context remain limited (Abolkasim & Shtewi, 2023). This study explores the influence of ChatGPT on enhancing the academic writing skills of Libyan tertiary EFL learners. It also examines their perceptions regarding the use of ChatGPT for academic purposes. By evaluating the benefits and limitations of ChatGPT, this study intends to provide valuable insights into the effective and responsible integration of AI-based writing tools in academic settings to enhance learning outcomes and writing proficiency. As highlighted by Al-Qahtani (2016) and Ghwela (2023), the integration of technology into language classrooms significantly increases student engagement and improves learning outcomes. Investigating the effectiveness of ChatGPT in this context may encourage its wider adoption, offering a complementary approach to conventional teaching methods and addressing existing gaps in pedagogical practices.

Objectives of the Study

1. To investigate the impact of interaction with ChatGPT on the English academic writing performance of EFL Libyan tertiary learners.
2. To explore the perceptions of EFL Libyan tertiary learners regarding the use of ChatGPT as a writing tool.

Research Questions

Guided by its objectives, this study seeks to address the following questions:

1. Does interaction with ChatGPT improve the English academic writing performance of EFL Libyan tertiary learners?
2. How do EFL Libyan tertiary learners perceive the use of ChatGPT as a writing tool?

Literature Review

This chapter reviews relevant literature concerning theories and empirical research to establish the conceptual foundation of the present study.

Impact of Chatbots and ChatGPT in Language Learning

Chatbots represent a cutting-edge application of artificial intelligence, designed to engage users in audio or text-based interactions (Haristiani, 2019). Although they may appear to be a recent innovation, their development dates back several decades. In an early evaluation, Coniam (2004) examined two pioneering chatbots, Dave and Lucy, as tools for language learning. Dave, created by the ALICE Artificial Intelligence Foundation, was envisioned as an ideal personal tutor; however, it exhibited limitations such as syntactic inaccuracies and communication challenges. Lucy provided initial help by manually addressing L2 learners' mistakes and suggesting corrections for specific grammar errors.

In 2022, OpenAI introduced ChatGPT (Chat Generative Pre-Trained Transformer), an advanced chatbot built on large language model (LLM) architecture. Trained on an extensive corpus of textual data, ChatGPT is capable of producing sophisticated and contextually relevant written responses (van Dis et al., 2023). It represents the latest development in a series of AI models released by OpenAI, a leading artificial intelligence company based in San Francisco. The model is available in two primary versions: GPT-3.5 and the more advanced GPT-4.

ChatGPT, as a conversational AI system, presents promising opportunities in language education by delivering personalized and interactive learning experiences for students (Montenegro-Rueda et al., 2023). It can propose enhancements, provide alternative wording, and explain corrections, aiding learners in understanding English writing conventions more thoroughly (Imran & Almusharraf, 2023). Furthermore, it helps in structuring ideas, enhancing the flow of writing, and improving overall clarity and coherence (Lund & Wang, 2023). By using ChatGPT, learners can build confidence, hone their language skills, and strive for higher proficiency.

Students' Increasing Reliance on AI Tools in Academic Contexts

University students, particularly EFL learners, have increasingly depended on artificial intelligence (AI) tools to support them in performing academic writing tasks. These learners often face difficulties related to grammar, organization, coherence, and vocabulary. As a

result, many students have begun to rely on AI tools like ChatGPT to receive instant suggestions, corrections, and support (Lund & Wang, 2023). While such tools offer clear benefits, including faster idea generation and language accuracy, this growing reliance raises concerns about the students' independent writing abilities and critical thinking skills (Xu & Jumaat, 2024). Some scholars warn that excessive dependence on AI technologies may undermine students' long-term language development and writing autonomy. Employing ChatGPT as a tool to enhance writing skills in EFL learners presents multiple difficulties, one of which is the tendency of students to become overly dependent on the technology (Baskara, 2023). Therefore, it is essential to explore how EFL learners are using ChatGPT, and whether it enhances their academic writing or fosters overreliance.

Theoretical Framework

The theoretical underpinning of this study is based on constructivism, a learning theory that highlights learners' active involvement in building knowledge through experiential and social interaction (Bruner, 1996). By promoting engagement, collaboration, and problem-solving over passive information intake, constructivism aligns well with the interactive and supportive features of ChatGPT as an academic writing assistant. By encouraging active participation in the writing process, facilitating user-tool interaction, and providing scaffolding through tailored suggestions and feedback (Vygotsky, 1980), ChatGPT supports the constructivist approach to learning.

Vygotsky's (1984) social constructivist theory centers on the Zone of Proximal Development (ZPD), which refers to the distance between what a learner can achieve independently and what they can accomplish with support from more knowledgeable individuals. This framework emphasizes that meaningful learning takes place within the ZPD, where guidance and collaboration foster cognitive growth. Within this context, AI tools function as scaffolding mechanisms, assisting learners in navigating their ZPD and gradually internalizing essential academic writing skills.

Furthermore, ChatGPT enhances the writing process by enabling students to organize ideas, refine arguments, and improve coherence,

fostering skill development within meaningful and contextually relevant tasks. This alignment positions ChatGPT not merely as a writing aid, but as an interactive partner that engages learners in a process of co-constructing knowledge, thereby fostering learners' critical thinking and and problem-solving skills. However, from a constructivist perspective, the use of AI tools like ChatGPT must be balanced to ensure they supplement, rather than replace, independent cognitive efforts in the learning process.

Previous Studies

A growing body of research has examined ChatGPT's role in language learning; however, due to the novelty of this research area, investigations are understandably confined to the past few years. Kim et al. (2024) conducted a comprehensive study involving 20 Chinese university students who engaged with a ChatGPT-4-integrated writing platform. The findings revealed that students envisioned AI fulfilling diverse roles, functioning as a versatile writing assistant, a virtual tutor, and a collaborative peer. Participants reported improvements in their writing processes, overall performance, and emotional engagement. Nonetheless, they encountered challenges stemming from the AI system itself, individual learner factors, and the nature of the writing tasks. This research provides a nuanced perspective on the influence of generative AI in academic writing and offers valuable insights for the development of educational AI tools and instructional design strategies.

Similarly, Artian and Fakhrurriana (2024) explored the perspectives of undergraduate English as a Foreign Language (EFL) students regarding the use of AI-powered ChatGPT in academic writing. Through qualitative analysis involving in-depth interviews and examination of academic writing documents, the study revealed both the benefits and challenges associated with ChatGPT's use. It provided valuable insights into how EFL learners engage with this AI tool in their academic tasks, informing strategies for its effective integration into educational environments to support the development of academic writing skills.

In terms of effectiveness, Masoudi (2024) examined the role of ChatGPT in enhancing the writing abilities of Saudi university students. The

study highlighted the potential of AI-powered tools, particularly ChatGPT, in delivering personalized feedback and tailored support to improve students' English writing skills. Employing a mixed-methods design comprising pre- and post-assessments, semi-structured interviews, and open-ended questionnaire, Masoudi analyzed the data thematically to assess learners' perceptions, experiences, and outcomes. The findings revealed that ChatGPT significantly improved participants' writing performance by providing individualized assistance and fostering greater engagement, emphasizing the transformative potential of AI in advancing English learning for EFL students.

Similarly, Özçelik and Ekşi (2024) investigated ChatGPT's impact on developing writing skills, focusing on formal register knowledge. The study utilized a single-case pre-experimental design, involving 11 Turkish participants selected through convenience sampling. The findings underscored ChatGPT's effectiveness in teaching register-specific writing tasks while noting participants' reduced reliance on the tool for informal contexts. This study reinforces the view that AI tools like ChatGPT serve as valuable learning assistants, providing personalized and context-specific support for writing.

Moreover, Quynh and Hien (2024) evaluated ChatGPT's effectiveness in supporting English writing skills among students at Ho Chi Minh City University of Physical Education and Sports. This study integrated ChatGPT into a seven-week writing practicum as part of the English module curriculum. Utilizing a mixed-methods approach including pre- and post-test assessments, surveys, and interviews, the researchers evaluated the tool's effectiveness. The results indicated a marked improvement in students' writing performance, showcasing the capacity of AI tools to support language learning and teaching practices.

In Libyan context, Abolkasim and Shtewi (2023) investigated the potential influence of ChatGPT on online learning among Libyan computer science students, focusing on its benefits and limitations. Through two experimental trials, the researchers identified notable limitations in ChatGPT's ability to produce reliable academic content for scientific writing in both Arabic and English. Despite these limitations, ChatGPT

provided personalized and interactive learning experiences, although it required learners to invest additional effort to succeed.

Methodology

This study employs a mixed-methods design, integrating both quantitative and qualitative approaches to investigate the influence of ChatGPT on students' writing skills. Researchers utilized various research instruments to ensure a thorough understanding of the findings and to enhance the validity of the results through methodological triangulation (Creswell, 2012). The quantitative phase involves a quasi-experimental design with pre-tests, an intervention using ChatGPT, and post-tests to assess students' writing performance before and after the intervention. According to Fraenkel et al. (2012), quasi-experimental methods are appropriate in educational settings where random assignment is not feasible. During the intervention, students use ChatGPT for idea generation and feedback integration. The qualitative phase includes semi-structured interviews to explore students' perceptions of ChatGPT's effectiveness and usability in academic writing. As Patton (2015) explains, semi-structured interviews allow for flexibility while maintaining a consistent line of inquiry.

Data collection began at the onset of the autumn semester during the 2024–2025 academic year and was carried out within students' writing classes. Quantitative data, obtained through pre- and post-tests measuring participants' writing performance, were analyzed using SPSS version 21. In parallel, qualitative data gathered from semi-structured interviews were examined through thematic analysis to uncover patterns and insights.

Participants

This study employed purposeful sampling, a strategy recommended by Creswell (2005) for selecting individuals who can provide rich and relevant information related to the central phenomenon. The researchers have chosen Libyan learners to investigate the effectiveness of using ChatGPT in enhancing their academic essay writing skills. The participants of this study consisted of 17 female students, aged around 20 and 21, in their fourth semester at the English

Language Department, Faculty of Art, Al-Asmarya Islamic University in Zliten, Libya. These students were selected specifically because they were enrolled in the "Writing 4" course, which focuses on academic essay writing. The rationale behind the selection of this group of students as subjects for the study was due to the alignment between the course objectives and the research focus, making them ideal candidates for evaluating the influence of ChatGPT on academic writing. The participants shared a similar educational background and were at a comparable level of English language proficiency, which contributed to the consistency and reliability of the study's findings (Merriam & Tisdell, 2016).

Results of the study

❖ Academic Writing Performance of EFL Libyan Tertiary Learners

The central objective of this study was to investigate how interaction with ChatGPT affects the English academic writing performance of Libyan EFL tertiary students. To evaluate this effect, participants' writing scores from pre-test and post-test assessments were compared. A Paired T-Test was utilized to determine the statistical significance of the differences between the two sets of scores.

Table (1)   Paired Samples Statistics for Overall Pre- and post- Tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre	17.4118	17	7.08042	1.71725
	Post	22.9412	17	5.40221	1.31023

The table (1) indicates increase in the mean from 17.4118 to 22.9412 suggests a positive impact between the two paired measurements. A lower standard deviation in the post-test hints that the values became more consistent after the intervention.

Table (2)   Paired Samples Test for Overall Pre- and post- Tests

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre - Post	-5.52941	3.22331	.78177	-7.18668	-3.87214	-7.073	16	.000

As presented in Table 2, the results of the Paired T-Test reveal a statistically significant difference between the pre-test and post-test scores, with the post-test mean notably higher. The T-value of -7.073 and a p-value of 0.000 (below 0.05) indicate that the intervention had a highly significant positive effect on the English academic writing performance of Libyan students.

The findings suggest that the participants' writing skills improved following the intervention. Figure (1) illustrates the overall results of the pre-test and post-test scores for 17 female Libyan EFL learners.
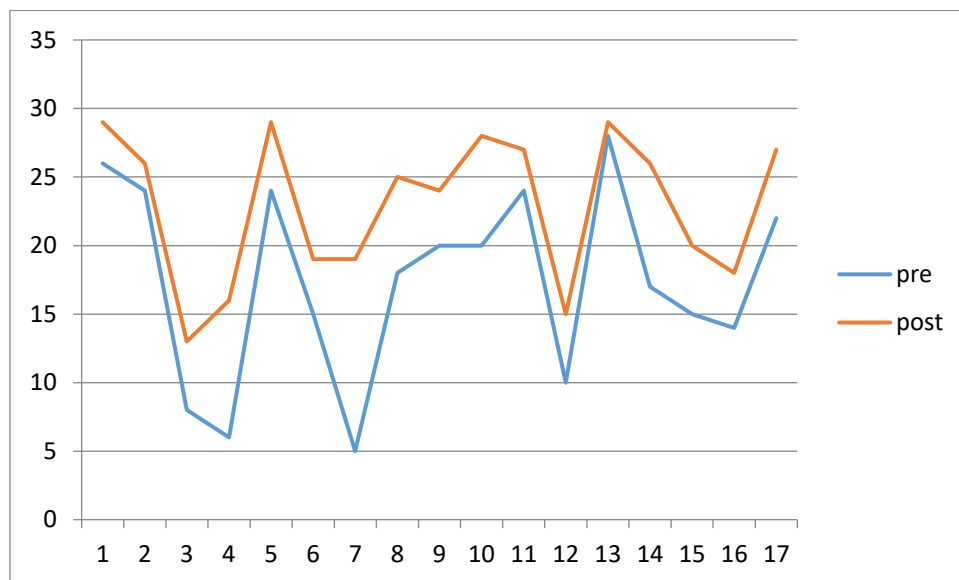
Figure (1)   The Impact of ChatGPT on the English Academic Writing Performance of EFL Libyan Tertiary Learners (Pre-test vs. Post-test)

Figure (1) illustrates the comparison between pre-test and post-test scores of 17 EFL Libyan tertiary learners. The results show a clear improvement in learners' academic writing performance after using ChatGPT, with post-test scores consistently higher than pre-test scores. This visual evidence supports the findings from the Paired Samples T-Test, which confirmed a statistically significant difference between the two sets of scores. The observed improvement highlights the effectiveness of ChatGPT in enhancing learners' English academic writing skills. The findings demonstrate that the intervention produced a statistically significant improvement in overall post-test scores.

❖ **Learners' Perception on using ChatGPT as a Writing Tool**

A thorough examination of the transcripts from the semi-structured interviews was conducted to ensure a dependable and meaningful exploration of how students perceived the intervention overall, with particular attention to its impact on their writing abilities. To interpret and organize the qualitative data, a thematic analysis approach was employed. The central focus of this section revolves around students' perception of using ChatGPT as a writing tool. From this core theme, five subthemes were identified: the effectiveness of ChatGPT, students' reliance on ChatGPT in academic writing, students' perceptions of

ChatGPT, future perspectives, and the challenges associated with its use.

1. Effectiveness of ChatGPT

Some students highlighted that ChatGPT played an effective role in improving various aspects of their academic writing. It supported them in organizing their thoughts and generating ideas, especially at the beginning stages of writing tasks. For example, S1 stated that "It helped me write more clearly and choose better words," referring to how ChatGPT supported her in expressing her ideas more effectively. Likewise, S3 emphasized that "It significantly improved my writing skills by explaining to me how to write correctly and use vocabulary properly," indicating how ChatGPT contributed to enhancing her writing structure and coherence by providing clear explanations and examples, helping her understand correct academic writing conventions and vocabulary use.

Furthermore, several participants mentioned that ChatGPT contributed to their vocabulary development and grammatical accuracy, which increased their confidence and motivation in writing. S4 expressed that "…when I write something and ChatGPT tells me what is wrong and corrects me, I feel more confident," suggesting that the tool's feedback served both as a learning guide and a source of encouragement. Moreover, S5 noted that "ChatGPT gives quick help, better ways to say my ideas, and shows me

how to fix my mistakes" illustrating that the tool enhanced her ability to express ideas more clearly and improved her writing organization through instant feedback. In general, students viewed ChatGPT as a valuable tool that not only helped them correct errors but also motivated them to improve and refine their writing over time.

2. Students' Reliance on ChatGPT in Academic Writing

The participants expressed different levels of dependence on ChatGPT in their academic writing, with some using it frequently and others relying on it more cautiously. S1 mentioned that "I strongly depended on ChatGPT because it noticeably improved my writing , expanded my vocabulary, and expressed my ideas more clearly and effective", revealing a high level of reliance on the tool due to its significant impact on her writing skills. It indicates that ChatGPT not only enhanced the clarity and effectiveness of her expression but also contributed to her vocabulary development, resulting in a more fluent and well-structured writing style. S6 shared a similar experience "Yes, it helped me improve my writing, correct mistakes, and give different ideas from my own, "suggesting that the student benefited from ChatGPT in multiple ways, including enhancing writing quality and accuracy. She also indicated that the tool served as a source of inspiration, broadening the student's perspective and supporting idea development beyond their initial thoughts. These responses indicate that for some students, ChatGPT has become an integral part of their writing practices and learning routines.

However, not all students demonstrated the same level of reliance. S2 stated that "I didn't depend heavily on ChatGPT. I used it only a few times for specific tasks, such as organizing paragraphs, writing outlines, and learning new vocabulary," demonstrating a limited but purposeful use of the tool. Although her reliance was minimal, she recognized its usefulness in supporting key writing skills like structure, planning, and vocabulary acquisition. Likewise, S3 explained that "I didn't completely depend on ChatGPT. I usually write the first draft using my own style, then use ChatGPT to get feedback, correct my mistakes, explaining why they were wrong, and suggesting better ideas when needed," showing a balanced and strategic use of the tool. It shows that she relied on her own writing skills first,

then used ChatGPT as a supportive resource for revision, learning from its explanations and improving her content through its suggestions. In addition, students (S2, S3, S4, S5, and S6) viewed that the teacher's guidance was irreplaceable and that ChatGPT served more as a supplementary tool. For example, S4 asserted that "I think that ChatGPT cannot substitute the role of the teacher, who is the essential source of knowledge and instruction. ChatGPT just acts as a supportive and guiding tool that can assist when needed". S5 also added that "actually, it is true that ChatGPT has great role in the world of writing, but it can't fully replace a teacher". Based on these perspectives, these insights reveal that while ChatGPT is widely utilized and appreciated, many students remain aware of its limitations and strive to maintain a balanced, responsible use of the tool in their academic work.

3. Students' Perceptions of ChatGPT in Academic Writing

Students expressed generally positive perceptions of ChatGPT in the context of academic writing, often describing it as a supportive and effective resource. S2 stated that " ChatGPT has been a great tool for improving my writing skills. It's essential for students to first master the basics of writing and provides additional support and examples to improve writing quality," highlighting the student's appreciation of ChatGPT as a helpful resource in developing writing skills. At the same time, it reflects an awareness that the tool is most effective when used after gaining foundational writing knowledge, as it offers supplementary guidance and examples to enhance the quality of written work. S4 mentioned that "AI tools as ChatGPT is considered excellent resources for language learning and writing skill development. These tools also help in building strong linguistic knowledge", highlighting the perceived value of Al tools in enhancing both language learning and writing abilities. It also suggests that such tools contribute to the development of a solid linguistic foundation, supporting students in improving their overall language proficiency. Additionally, S5 viewed that " ….ChatGPT is very useful , and I think it becomes necessary method for learning in modern world," expressing a strong belief in the tool's value and effectiveness.

The students regard ChatGPT as more than a supportive tool, it is viewed as a vital component

of modern learning, underscoring its increasing relevance in today's educational landscape. Therefore, these viewpoints suggest that students perceive ChatGPT not merely as a supplementary tool, but as a vital element of their educational journey, enhancing conventional learning approaches and providing ongoing assistance in refining their writing skills.

4. Future Perspectives

Many students shared useful ideas about how ChatGPT could be improved in the future to better support their learning. One of the most common suggestions was making the responses easier to understand. For example, S1 said that "ChatGPT should give answers that match the student's level and avoid using difficult words or complex language," reflecting a concern about language accessibility and comprehension. It suggests that for ChatGPT to be more effective as a learning tool, its responses need to be simplified and adapted to the learner's proficiency level. S2 also pointed out that " some answers were hard to understand because the language was too advanced, and I hope ChatGPT would use simpler words," reflecting a challenge faced when interacting with the tool due to complex vocabulary. This suggests that simplifying language could enhance the tool's accessibility and make it more helpful for learners with lower proficiency levels. S3 agreed and said that "ChatGPT should respond in a way that fits my level as a learner, so I can benefit more from using it," showing the importance of level-appropriate responses for effective learning. It suggests that adapting the language and complexity of ChatGPT's answers to match the student's proficiency can enhance understanding and maximize the tool's educational benefits.

Some students also hoped for more useful features in the future. S5 suggested that "It would be better if Chat GPT could give practice based on my weak points and show how my writing gets better over time," highlighting a desire for more personalized and adaptive learning support. It reflects the student's interest in tracking progress and receiving targeted practice that addresses specific areas of weakness to improve writing skills gradually. S6 added that " it would be more helpful if ChatGPT could give different ways to write, explain why something is wrong, and offer exercises to help students learn and practice more,"

demonstrating the student's desire for a more interactive and educational experience. These ideas show that students like using ChatGPT but hope it can become more flexible and supportive for different learning needs in the future.

5. Challenges of ChatGPT

The students expressed different views about the difficulties they faced when using ChatGPT. Some of them found it challenging, especially when the responses were too difficult or used advanced language. For example, S1 said that " one of the main issues I faced was that ChatGPT sometimes gave answers that were too complex or academic, making them hard to understand," highlighting a challenge where the complexity and academic nature of ChatGPT's responses made them difficult to comprehend. It suggests that for the tool to be more effective, it needs to tailor its answers to a simpler, more accessible level for learners. In the same way, S4 said that "ChatGPT didn't give me exactly what I needed. So, if I want to get a good answer, I must ask clear and specific questions and If the answer was too difficult or complex, I would ask ChatGPT to make it simpler," revealing the student's realization of the need for clear communication with ChatGPT to obtain useful responses. It also demonstrates an adaptive approach, where the student actively manages the complexity of the responses by requesting simpler explanations when needed. She also added that " sometimes I wasn't sure if the information was correct, so I used it carefully and didn't rely on it too much," reflecting the student's cautious approach to using ChatGPT, as she expressed uncertainty about the accuracy of the information provided. It highlights the importance of critically evaluating the tool's responses and suggests that while ChatGPT can be useful, the student prefers not to rely on it too heavily without verifying the information. S5 shared a similar view, saying that " ChatGPT didn't always understand what I mean, or it gave very general answers. This made me realize the importance of asking clear questions and checking the answers properly," indicating the student's frustration with the tool's occasional lack of understanding and overly broad responses. It highlights the need for clear communication with ChatGPT and emphasizes the importance of verifying the information received for accuracy and relevance.

On the other hand, some students reported experiencing no difficulties while using the tool. For instance, S2 said that " ChatGPT was easy to use and always gave me the necessary support ," . S3 agreed, saying that "I did not face any challenges when using ChatGPT. It was an excellent and easy-to-use tool that effectively supports me in improving my writing," expressing positive experiences with ChatGPT, highlighting its ease of use and effective support. S2 appreciates how the tool consistently provided the help she needed, while S3 emphasizes that she encountered no challenges and found it to be an excellent resource for improving her writing skills. Likewise, S6 said that " ChatGPT easy and flexible, which made it available and useful at any time," emphasizing the student's appreciation for the tool's accessibility and adaptability. These different experiences show that while some students found it hard to understand or get accurate answers from ChatGPT, others found it easy and helpful. The challenges seemed to depend mostly on how the students used the tool and how clear their questions were.

Discussion

The findings of this study demonstrate that the intervention produced a statistically significant improvement in learners' post-test scores, confirming ChatGPT's effectiveness in enhancing academic writing performance. These results are consistent with prior studies (Kim et al., 2024; Masoudi, 2024; Quynh & Hien, 2024), which similarly reported gains in writing proficiency and engagement. Within the framework of constructivist learning theory (Vygotsky, 1980), ChatGPT can be understood as a scaffold that supports learners' progression through the Zone of Proximal Development (ZPD), offering guided assistance that facilitates the co-construction of knowledge and the gradual acquisition of advanced writing skills.

However, the growing reliance on ChatGPT raises important pedagogical challenges. As Abolkasim and Shtewi (2023) caution, students may accept AI-generated feedback uncritically, which risks diminishing their autonomy and capacity for self-regulation. This concern is echoed by Kim et al. (2024), who argue that ChatGPT's feedback often oversimplifies disciplinary conventions, encouraging formulaic writing rather than fostering deeper critical thinking. Such findings highlight a tension between the promise of personalized support and the limitations of algorithmic feedback, suggesting that improvements in performance may not always translate into enhanced critical or independent writing skills.

The variability of reliance further complicates the narrative of effectiveness. Özçelik and Ekşi (2024) observed that learners demonstrated decreased dependence on ChatGPT in informal contexts, indicating that its utility is shaped by task type, learner confidence, and prompt clarity. This resonates with the present study, where challenges were often linked to how students formulated their questions and interacted with the tool. Similarly, Artian and Fakhrurriana (2024) reported that unclear prompts and overuse of ChatGPT limited its effectiveness, underscoring the importance of learner agency in maximizing its pedagogical value.

Conflicting literature also raises broader concerns regarding originality, academic integrity, and equitable access. While some scholars emphasize ChatGPT's potential to democratize writing support, others warn that excessive reliance may blur the line between assisted writing and plagiarism. Moreover, unequal access to AI tools risks exacerbating disparities in academic performance across socio-economic contexts. Masoudi (2024) further notes that learners themselves have called for improvements in ChatGPT's natural language processing capabilities to provide more precise and contextually relevant feedback, reflecting both appreciation for its utility and recognition of its current limitations.

Taken together, these insights suggest that while ChatGPT can serve as an effective scaffold within the ZPD, its pedagogical value depends on balanced, critical use. Learners must be guided to treat AI feedback as a resource for reflection rather than a definitive solution. This study contributes to the ongoing debate by providing empirical evidence of improved academic writing performance, while also highlighting the challenges of reliance and the importance of fostering critical awareness of AI's limitations. Future research should explore strategies for integrating ChatGPT into writing pedagogy in ways that promote learner autonomy, critical engagement, and equitable access.

Implications

The results of this study highlight the potential advantages of incorporating ChatGPT intervention in writing classes, offering valuable insights for researchers, educators, material developers, and teachers. One notable implication is the need to integrate such interventions into writing instruction at Libyan higher education institutions.

Another key implication relates to the EFL curriculum in Libyan schools: the integration of ChatGPT as a pedagogical aid in academic writing instruction. Teachers can employ ChatGPT to assist students in generating ideas, organizing content, paraphrasing complex sentences, and expanding academic vocabulary. It also lends itself well to collaborative peer and group writing tasks, fostering engagement and cooperative learning. This integration supports learner autonomy by enabling learners to work independently and allowing for individualized pacing, both in and out of the classroom. Moreover, it encourages greater involvement in the writing process, boosting student motivation and confidence.

For effective implementation, students should receive clear guidance on ethical and critical use of ChatGPT, ensuring it enhances, rather than replaces, their writing efforts. Additionally, using ChatGPT can alleviate teachers' workloads in basic error correction, allowing them to focus more on developing students' higher-order writing competencies, including critical thinking and coherent organization.

ChatGPT can also be a valuable asset in curriculum development by assisting teachers in designing writing lessons, suggesting relevant tasks, examples, and topics, and adapting materials for learners at varying proficiency levels. This enhances instructional flexibility and aligns with contemporary teaching approaches. Consequently, collaboration between material designers, curriculum developers, teachers, and students is essential for creating more effective programs, tailored resources, and diverse activities that foster a more dynamic and supportive language learning environment.

Limitations of the study

While this study provides valuable insights, it has several limitations that must be acknowledged. First, the research was conducted at a single academic institution, the Faculty of Arts at Al-Asmarya Islamic University, limiting the applicability of the results to other universities or faculties in Libya. Second, the focus on fourth-semester students restricts the diversity of the participants, particularly in terms of their academic levels and experiences. Additionally, the small sample size, with only 17 female students, means the findings cannot be generalized to the broader population of Libyan tertiary EFL learners. This limitation affects the ability to draw broader

conclusions about the effectiveness of ChatGPT in improving academic writing for all Libyan students.

Another limitation is the absence of a control group, which means the study could not directly compare the performance of students using ChatGPT with those not using it. As a result, it is difficult to attribute the improvements in writing skills solely to the use of ChatGPT. Finally, the relatively short duration of the study may not have been enough to observe the long-term effects of ChatGPT on academic writing development.

Conclusion

This study demonstrated a clear and significant effect of ChatGPT intervention on the academic writing performance of Libyan tertiary EFL learners. Students' perceptions, gathered through interviews, further highlighted the benefits of integrating ChatGPT into writing classes. Learners reported noticeable improvements in areas such as organization, clarity, and vocabulary, indicating that AI tools like ChatGPT can serve as valuable supplementary resources for language development. students' feedback also provided useful insights into practical applications of ChatGPT as a learning aid. However, while the findings are encouraging, the study emphasizes that the tool's effectiveness largely depends on how it is implemented and the degree of teacher support. Notably, ChatGPT should be viewed as a complement, not a replacement, for essential human feedback in the writing process.

Overall, the research supports the idea that, when used appropriately, ChatGPT can enhance writing skills among Libyan EFL learners. Nonetheless, additional research is warranted to explore the long-term implications of ChatGPT and to refine its application across diverse educational settings. In summary, this study offers valuable contributions to the existing body of literature, illuminating the evolving role of AI in enhancing academic writing instruction.

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