Pak. j. life soc. Sci. (2024), 22(2):13802-13814 E-ISSN: 2221-7630;P-ISSN: 1727-4915

Pakistan Journal of Life and Social Sciences
www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.2.00991

RESEARCH ARTICLE

Exploring the Saudi EFL learners' Perceptions and Challenges in AI-Assisted Post-Editing Tools for Writing

Ghazwan Mohammed Saeed Mohammed

Department of English and Literature, College of Arts and Letters, University of Bisha, Bisha, Saudi Arabia

ARTICLE INFO

Received: July 4, 2024

Accepted: Nov 19, 2024

Keywords

AI-assisted post-editing

Saudi EFL learners

Writing accuracy

AI tools

Challenges in AI usage

EFL learners' perceptions

***Corresponding Author:**

gmsaeed@ub.edu.sa

ABSTRACT

This research study investigates Saudi English as a Foreign Language (EFL) learners' perceptions and challenges when using artificial intelligence (AI)-assisted post-editing tools to improve their writing. 250 students from three Saudi universities, namely University of Bisha, King Khalid University and Jazan University, participated in a survey designed to evaluate their experiences with AI tools, such as grammar checkers and writing assistants, focusing on their effectiveness, usability, and limitations. The results show, on the one hand, that students believe AI tools are very effective in improving their grammatical accuracy and confidence in writing; on the other hand, they are rather suspicious of the possibility of these tools enhancing higher-order writing skills such as coherence and academic style. Statistical analysis found that there are positive relationships between using AI tools and the learners' writing performance, particularly in grammar and error detection. At the same time, the results indicated that there are some challenges encountered the learners when using AI tools in the process of writing post-editing. They showed that the learners' heavy reliance on AI tools may hamper their ability to develop independent writing skills. This study aims to contribute to discussions on the role of AI in language education, providing some practical implications for teachers who are looking to adopt AI tools in EFL writing instruction. Further research is needed to check how AI tools could be improved to help the learners develop their writing skills and help the instructors to look at the long-term effects on writing ability.

INTRODUCTION

Artificial intelligence in the field of education has undergone a very fast transformation from the old traditional methods of teaching to new ways of language acquisition and instruction. The most striking feature under this transformation is AI resources being used for the enhancement of writing skills, mostly in EFL contexts. Writing is considered one of the most difficult aspects of language learning because it requires the learners to attain a level of competence not only in grammatical and lexical knowledge but also in the coherent structuring of thoughts, the clearness of presenting an argument, and observing the stylistic conventions of writing in English. This task is even more complicated for non-native speakers of English who deal with a variety of linguistic and cultural differences between their first language (L1) and English as a second language / foreign language.

Saudi Arabia, a country where English is a mandatory subject in schools and universities, is an excellent example of a context where these challenges are particularly pronounced. Saudi students face significant challenges in English academic writing at the tertiary level, despite its mandatory status in Saudi education. These difficulties include language issues, argumentation, and research-article genre (Al Mahmud & Rahmanu, 2023). Students struggle with presenting complex information clearly and building strong

arguments (Al Mahmud & Rahmanu, 2023). The learning environment, teaching approaches, and mastery of academic writing skills significantly influence students' performance (Alasbali et al., 2023). Factors contributing to these challenges include negative attitudes towards English, inadequate preparation for English-medium study (Ankawi, 2015), and a reliance on instructors as the sole source of knowledge (Alkubaidi, 2019). Additionally, students often resort to memorizing passages to pass English courses, while instructors focus on form and mechanics rather than communicative aspects of writing (Alkubaidi, 2019). These findings highlight the need for improved instructional approaches and support systems to address the academic writing challenges faced by Saudi students.

Artificial Intelligence (AI) and Natural Language Processing (NLP) are increasingly being adopted in education and research, with applications ranging from feedback analysis to academic writing assistance (Shaik et al., 2023). AI-assisted tools, particularly those utilizing NLP algorithms, are among the most widely adopted AI applications in education, offering capabilities such as error detection, improvement suggestions, and personalized feedback (Shaik et al., 2023; Chen et al., 2020). However, challenges remain, including the need for deeper integration of advanced AI techniques with educational theories and addressing ethical concerns (Chen et al., 2020). As AI continues to evolve, it is crucial for educators and researchers to stay informed about emerging tools and their applications in academic settings to effectively leverage these technologies.

Recent studies explore the use of AI in writing for Saudi EFL students. AI-powered tools like Wordtune, Grammarly, and ChatGPT are increasingly utilized in tertiary education, enhancing writing quality and efficiency (Abdalgane & Othman, 2023; Selim, 2024; Al Mahmud, 2023). These technologies facilitate language learning, keeping both teachers and students updated on technological advancements (Abdalgane & Othman, 2023). Abdelgane and Othman (2023)'s study examines the use of AI technologies, including machine translation tools, writing assistants, and automated assessment systems, in English as a Foreign Language (EFL) classrooms in Saudi Arabia, and finds that the use of these AI technologies can facilitate the English language learning process and keep both teachers and students up-to-date on recent technological developments. Selim (2024) investigates the perspectives of EFL university students on the use of AI-powered writing tools and their impact on academic writing, finding that students generally have a positive view of these tools and see them as beneficial for improving writing quality, saving time, and enhancing academic integrity, although they recognize the need for a balanced approach that complements traditional writing skills. She found that students generally favor integrating AI tools into coursework, although instructor support varies. Research shows that AI-assisted students outperform their peers in writing exams, demonstrating improvements in lexical and syntactic aspects (Al Mahmud, 2023). He found that the use of the AI-powered writing tool Wordtune led to significant improvements in the writing performance of Saudi EFL students, including gains in lexical resourcefulness and sentence structure, with similar benefits for both male and female participants.

The rise of AI tools in language learning, however, has not been without its challenges. Some scholars argue that while AI-driven feedback offers instant corrections, it may not always align with learners' cognitive processes and can result in over-reliance on the technology (Zou et al., 2023). Moreover, there are concerns about whether AI can fully understand the nuances of learners' writing, including context-specific errors, idiomatic expressions, and the cultural aspects of language use. As such, there is a growing need for research to examine the perceptions and challenges experienced by EFL learners, especially in the Saudi context, where the educational landscape is evolving rapidly.

For Saudi EFL learners, the integration of AI-assisted post-editing tools into writing instruction holds substantial promise. According to Alnasser (2022), Computer-based feedback systems have also been positively received by EFL learners, with significant changes in perception after use. AI tools in education offer personalized, timely feedback that can enhance learning experiences and outcomes. These tools can provide real-time responses to student questions, adapt course materials, and support the development of feedback literacy capabilities (Evenddy, 2024; Triberti et al., 2024; Tubino & Adachi, 2022). AI-driven feedback often surpasses traditional methods in speed, availability, and personalization, potentially

improving language skills and learner engagement (Evenddy, 2024). While AI tools show promise in complementing teaching and reducing teacher workload, challenges remain, including accuracy issues and institutional resistance (Evenddy, 2024). Future research should explore high-level opportunities for AI in higher education, focusing on learning outcomes and overall experience quality (Triberti et al., 2024). Integrating AI tools with human elements may offer the most effective approach to enhancing educational processes.

Given the growing interest in AI in Saudi education, this study seeks to investigate the perceptions and challenges of Saudi EFL learners in using AI-assisted post-editing tools. This study explores how these learners interact with these tools, the benefits they perceive, and the obstacles they face when using AI tools to improve their writing. By focusing specifically on Saudi learners, this study will contribute valuable insights to the existing body of literature on AI in language learning, particularly in the Arab world.

Despite the advantages of using AI tools in writing post-editing, the use of AI-assisted post-editing tools is not without challenges. One limitation is that these tools primarily focus on surface-level errors, such as spelling, punctuation, and basic grammar mistakes. However, they may not be as effective at identifying more complex issues, such as stylistic inconsistencies, tone, deeper syntactical problems, coherence, or rhetorical strategies. This gap highlights the need for AI tools to be used in conjunction with human feedback, particularly when it comes to developing higher-level writing skills.

This study aims to fill this gap by exploring Saudi EFL learners' perceptions of AI-assisted post-editing tools, the challenges they face in using these tools, and how they believe these tools contribute to their writing development. Given the increasing importance of English in Saudi education and the integration of digital technologies into the curriculum, this research will provide valuable insights into the ways AI tools can enhance EFL writing instruction in Saudi Arabia.

Research Objectives and Questions

The primary objective of this study is to explore the perceptions and challenges of Saudi EFL learners in using AI-assisted post-editing tools for writing. Specifically, the study aims to answer the following questions:

1. What are the Saudi EFL learners' perceptions of the effectiveness and usefulness of AI-assisted post-editing tools in enhancing their writing skills?
2. What are the benefits and limitations of using AI tools for post-editing in the context of Saudi EFL learners?
3. What are the challenges and barriers Saudi learners face when using AI tools for writing post-editing?

REVIEW OF LITERATURE

AI in Education

Artificial Intelligence (AI) has revolutionized various sectors, with education being one of the most significant beneficiaries of these advancements. AI in educational contexts has paved the way for new tools that can assist in delivering personalized learning experiences, automating administrative tasks, and enhancing the learning process itself. AI applications in education include adaptive learning platforms, automated grading, and facial recognition systems to analyze student behavior (Akgun & Greenhow, 2021). Artificial intelligence in education (AIEd) has evolved from computer-based technologies to web-based intelligent systems and humanoid robots, improving administrative functions and teaching quality (Chen et al., 2020). Despite its potential benefits, ethical challenges in AIEd, particularly in K-12 settings, need to be addressed (Akgun & Greenhow, 2021). As AIEd continues to develop, it is crucial for educators and students to understand its implications and ethical considerations (Akgun & Greenhow, 2021).

Specifically, AI-powered applications for language learning, such as grammar checkers, writing assistants, and AI post-editing tools, have gained widespread attention due to their ability to provide instant feedback to learners (Li, 2020). These tools use sophisticated Natural Language Processing (NLP) techniques to analyze written text, identify errors, and propose corrections or improvements in real time.

The Role of AI in EFL Education

Artificial Intelligence (AI) is increasingly impacting English as a Foreign Language (EFL) education, offering both opportunities and challenges. Jiang (2022) stated that AI applications in EFL include automated evaluation systems, intelligent tutoring systems, chatbots, and virtual environments. His study provides a comprehensive review of how artificial intelligence (AI) is empowering English as a Foreign Language (EFL) teaching and learning in six dominant forms: Automatic Evaluation Systems, Neural Machine Translation Tools, Intelligent Tutoring Systems, AI Chatting Robots, Intelligent Virtual Environment, and Affective Computing in Intelligent Tutoring Systems. These technologies can enhance personalized learning, provide targeted feedback, and improve access to educational resources as found by Seif Eldin (2024). AI also shows promise in EFL teacher education programs, potentially improving the quality of instruction and facilitating continuous professional development (Seif Eldin, 2024).

The integration of AI in EFL contexts raises ethical concerns, such as data privacy, academic integrity, and potential job insecurity for teachers (Alghamdy, 2023). Additionally, there are pedagogical considerations, including the risk of over-reliance on technology and the potential loss of cultural nuances in language learning (Alghamdy, 2023). While AI positively impacts EFL teaching and learning, it requires careful integration and increased awareness among educators and students (Alhalangy & Abdalgane, 2023).

The use of AI in writing instruction has shown promise in improving writing accuracy, fluency, and overall quality. By providing real-time corrections, AI tools help learners address grammatical issues, spelling mistakes, and syntactic errors, which are particularly problematic for EFL learners. AI tools have demonstrated significant potential in enhancing the feedback process for online learners. These tools can provide immediate, personalized feedback, allowing students to promptly identify and correct mistakes, thereby improving their performance in real-time (Rakya, 2023; Yu & Canton, 2023).

AI-Assisted Post-Editing in Writing Instruction

Post-editing, in the context of writing, refers to the process of revising and improving a text after its initial composition. Traditionally, post-editing is done manually, with writers reviewing their text for errors and making corrections. With the rise of AI tools, however, post-editing has become increasingly automated. AI tools like Grammarly and ProWritingAid are designed to assist learners in this process by automatically identifying errors and suggesting corrections in real time. While these tools were initially used primarily for basic grammatical and spelling errors, modern AI systems have evolved to include stylistic improvements, such as sentence structure, word choice, and clarity. Recent studies have explored the potential of AI-assisted writing tools in enhancing EFL/ESL students' writing skills. Research indicates that AI technologies can significantly improve students' writing performance, particularly in areas such as task achievement, coherence, lexical resource, and grammatical accuracy (Wale & Kassahun, 2024; Marghany, 2023). AI-powered writing assistants have been shown to increase students' behavioral, emotional, and cognitive engagement, as well as their self-efficacy and positive emotions towards writing (Nazari et al., n.d.). Studies have also found that students generally have positive perceptions of AI writing tools, viewing them as interesting, effective, and supportive (Wale & Kassahun, 2024).

Artificial Intelligence (AI) is playing an increasingly important role in English language education, particularly for EFL learners. AI-based tools can enhance teacher education programs, improve communication skills, and assist in writing tasks (Eldin, 2024; Rusmiyanto et al., 2023; Gayed et al., 2022). These technologies offer personalized learning experiences, identify knowledge gaps, and facilitate adaptive learning (Eldin, 2024). AI writing assistants, such as "AI KAKU," can help reduce cognitive barriers for EFL learners during writing tasks, allowing them to focus on higher-level aspects like organization and revision

(Gayed et al., 2022). However, the effectiveness of AI tools depends on learners' ability to post-edit machine-translated text. Research shows that L2 proficiency influences learners' capacity to employ appropriate post-editing strategies, such as deletion, paraphrase, and grammar correction, when working with neural machine translators like Google Translate (Shin & Chon, 2023). As AI continues to transform language education, further research is needed to explore its long-term effects and optimal integration (Rusmiyanto et al., 2023).

The benefits of AI-assisted post-editing tools are numerous. First, they provide real-time error detection and feedback, which supports learners in quickly addressing mistakes as they arise. Second, these tools can help learners with tasks they might otherwise struggle with, such as improving the coherence of their ideas, restructuring sentences, or enhancing vocabulary. Third, AI tools offer a non-judgmental environment where learners can experiment with their writing and learn from their mistakes without the pressure of immediate peer or teacher evaluation (Zou et al., 2023).

The Impact of AI-Assisted Post-Editing on EFL Writing Skills

Recent studies have explored the impact of AI-assisted tools on EFL writing skills, revealing promising results. AI-powered writing tools have been shown to significantly improve students' writing proficiency, enhance motivation, and promote engagement (Song & Song, 2023; Dong, 2023). These tools offer timely, individualized feedback and increase grading efficiency (Dong, 2023). A reflective thinking promotion mechanism integrated into AI-supported writing environments has demonstrated improvements in writing performance, self-efficacy, and self-regulated learning while reducing cognitive load (Liu et al., 2021). AI-based writing assistants can help EFL learners overcome cognitive barriers in text production, allowing more focus on higher-level writing tasks (Gayed et al., 2022). However, concerns about contextual accuracy and over-reliance on AI have been noted (Song & Song, 2023). Overall, these studies highlight the potential of AI-powered pedagogy in transforming EFL writing instruction, offering practical implications for educators and researchers in the field.

AI tools that offer real-time feedback can thus play a pivotal role in fostering a self-regulated learning environment, enabling learners to take charge of their own writing process. Research by Zou et al. (2023) demonstrated that learners who used AI tools for writing tasks showed significant improvements in their grammatical accuracy and fluency, as these tools allowed them to identify and correct their errors without relying solely on teacher input.

Recent studies highlight the growing importance of post-editing skills in the era of AI-powered translation tools. Research shows that metacognitive strategies, including planning, monitoring, and evaluation, play a crucial role in the post-editing process (Dwi Indarti, 2024). AI-powered writing tools have been found to significantly improve students' engagement, self-efficacy, and emotions in academic writing contexts (Nazari et al., n.d.). L2 learners' ability to employ post-editing strategies for machine translation errors is influenced by their language proficiency, with strategies including deletion, paraphrase, and grammar correction (Shin & Chon, 2023). These findings underscore the potential of AI-powered post-editing tools in enhancing learners' metacognitive skills and overall translation abilities.

AI-Assisted Post-Editing and Learner Perceptions

The success of AI tools in EFL education depends not only on their technical capabilities but also on how learners perceive and interact with them. Understanding learners' attitudes toward AI-assisted post-editing is crucial for evaluating the effectiveness of these tools. In general, research indicates that EFL learners tend to view AI tools positively, appreciating the convenience and immediate feedback they provide (Zou et al., 2023).

A study by Lee et al (2024) explored the perceptions of university students in South Korea who used an AI-powered writing assistant. The study found that while students generally regarded the tool as useful, there were mixed opinions about the quality of its feedback. Some students felt that the suggestions were too mechanical and did not account for the nuances of meaning or tone, which are often critical in academic

writing. This is particularly relevant in an EFL context, where learners may already face difficulties with the subtleties of the target language, and AI tools may unintentionally reinforce incorrect usage if their feedback is not sufficiently sophisticated.

In the Saudi context, the perceptions of AI-assisted post-editing tools are shaped by several factors, including the level of technological integration in the educational system, cultural attitudes toward technology, and learners' previous experiences with digital tools.

Challenges of AI-Assisted Post-Editing Tools for Saudi EFL Learners

While AI tools have the potential to improve EFL writing, their effectiveness is influenced by various challenges that learners face in different contexts. In Saudi Arabia, these challenges are exacerbated by factors such as limited digital literacy, disparities in access to technology, and the unique linguistic and cultural barriers that Saudi learners face.

Saudi EFL learners often struggle with the syntactic and grammatical differences between Arabic and English, which can result in errors such as word-order mistakes, inappropriate use of prepositions, and incorrect verb tenses. Additionally, the semantic structure of Arabic differs significantly from that of English, which can make it difficult for learners to produce writing that adheres to English conventions. AI-assisted post-editing tools can help address some of these issues by offering corrections, but the tools often have difficulty identifying more complex linguistic errors, such as those related to tone, context, or cultural nuances (Alseweed, 2020). For instance, AI tools may not recognize the subtle differences between formal and informal language, which are particularly important in academic writing.

Recent studies have explored the challenges and potential of AI-assisted tools in EFL learning for Saudi students. While learners generally hold positive attitudes towards AI-powered learning (Jamshed et al., 2024), implementation challenges persist, including inadequate training, incompetence, and poor web infrastructure (Abalkheel, 2022). AI-based translation tools have shown promise in improving students' translation skills, particularly in areas like fluency and coherence (Thabet & Qadha, 2024). Benefits include improved student experiences and skills, while challenges involve implementation difficulties and quality concerns. To address these issues, researchers suggest integrating AI with pedagogical frameworks like Bloom's digital taxonomy to enhance educational quality and effectiveness (Abalkheel, 2022). Overall, strategic integration of AI tools could help overcome challenges in EFL learning, but careful consideration of their limitations is necessary.

While AI-driven feedback systems offer benefits like personalization and real-time assistance (Evenddy, 2024), excessive dependence on these tools may hinder critical thinking and autonomous learning skills (Shibani et al., 2024). However, when properly implemented, automated feedback systems can enhance learner autonomy and emotional self-regulation (Li & Kim, 2024). To maximize benefits, educators should guide students in critically engaging with AI tools, combining human and automated feedback (Li & Kim, 2024; Evenddy, 2024). This approach can foster sustained learning beyond the classroom while mitigating potential negative impacts on skill development (Li & Kim, 2024). As AI becomes increasingly prevalent in education, developing AI literacy and critical interaction skills is crucial for effective human-AI partnerships in learning (Shibani et al., 2024).

METHODOLOGY

This study aims to explore the perceptions and challenges faced by Saudi EFL learners in utilizing AI-assisted post-editing tools to improve their writing. The research uses a quantitative methodology, specifically a survey, to gather data from Saudi EFL learners. The survey approach allows for the collection of large-scale data on learners' perceptions, attitudes, and experiences with AI tools, which can then be analyzed statistically to draw conclusions about trends and correlations within the sample population.

1. Participants

The participants in this study are Saudi Arabian EFL learners enrolled at three Saudi universities, namely University of Bisha, King Khalid University and Jazan University. The sample consists of undergraduate students majoring in English language. Participants are selected using a stratified random sampling technique to ensure that the sample reflects a diverse range of learners in terms of gender, age, academic background, and familiarity with AI tools. The estimated sample size for this study is 250 learners, which allows for the identification of general patterns while considering statistical power for detecting meaningful differences between subgroups.

2. Instrument

The primary instrument used for data collection is an online survey designed specifically for this research. The survey comprises multiple sections aimed at understanding learners' demographics, their familiarity with AI-assisted post-editing tools, and their experiences with these tools in their writing practices. The survey consists of both closed-ended and open-ended questions, including Likert-scale items, multiple-choice questions, and a few open-ended questions to allow for rich qualitative insights.

The survey is divided into the following key sections:

Demographic Information: Questions related to participants' gender, age, academic year, and prior experience with AI tools.

Perceptions of AI Tools: Items designed to assess learners' attitudes toward using AI tools for post-editing. Questions explore how learners perceive the usefulness, ease of use, and effectiveness of these tools in improving their writing skills.

Challenges in Using AI Tools and Additional Insights: This section aims to identify any barriers or difficulties faced by learners when using AI-assisted post-editing tools. The questions cover aspects such as technical issues, perceived limitations of the tools, and the effectiveness of feedback. Open-ended questions allow participants to provide further feedback, including suggestions for improving AI tools and describing any challenges or benefits they may have experienced that were not captured by the previous questions.

Prior to the distribution of the survey, a pilot study is conducted with a small group of learners to test the clarity and reliability of the questions. Adjustments are made based on feedback from the pilot group to enhance the validity and reliability of the instrument.

3. Data Collection Procedure

A google form link to the survey was distributed with participants being informed about the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. Informed consent was obtained from all participants prior to their involvement in the study. The survey was open for a period of two weeks, during which participants can complete the survey at their convenience. Then, all the responses were collected and stored securely for analysis. The data set was anonymized to ensure that no personally identifiable information is linked to individual responses.

4. Data Analysis

Once the survey responses were collected, the data underwent quantitative analysis using SPSS (Statistical Package for the Social Sciences). The analysis included:

- **Descriptive Statistics**: The first step was to compute descriptive statistics (mean, standard deviation, frequency distributions) for each of the survey items. This allows for an overall understanding of the responses and provides an overview of learners' perceptions and experiences with AI tools.
- **Factor Analysis**: To identify underlying factors that explain patterns in participants' responses, factor analysis is performed. This can help to group related items and understand the key dimensions of learners' perceptions of AI tools.

- **Inferential Statistics**: To explore potential relationships between variables, such as differences in perceptions based on demographic factors (e.g., gender, age, academic year), inferential statistical tests (e.g., t-tests, ANOVA) are conducted. This helps to identify whether certain groups of learners have different perceptions or face distinct challenges when using AI tools.
- **Qualitative Analysis**: The open-ended responses are analyzed thematically using qualitative coding techniques. Thematic analysis allows for the identification of recurring themes and patterns in the learners' feedback. This helps to enrich the quantitative findings and provide deeper insights into the challenges and benefits of using AI-assisted post-editing tools in the Saudi EFL context.

RESULTS

This section presents the results of the analysis of the survey responses, which sought to explore Saudi EFL learners' perceptions and challenges in using AI-assisted post-editing tools. The survey consisted of 20 items and was designed to examine various aspects of AI tools, such as their effectiveness in improving writing quality, their ease of use, and the learners' overall experience. The results are analyzed using descriptive statistics, factor analysis, and inferential statistics, including t-tests and ANOVA, to identify patterns in the data and address the research questions.

1. Descriptive Statistics

Descriptive statistics provide an overview of learners' general perceptions of AI-assisted post-editing tools. For each item, the mean and standard deviation and frequency distribution are calculated. These measures help identify trends in learners' attitudes toward different aspects of AI-assisted writing support.

Table 1: Descriptive Statistics for Learners' Perceptions of AI Tools

No	Survey Item	Mean	Std. Dev.	Frequency (%)
1	AI tools help me identify grammatical errors.	4.25	0.80	80% Agree/Strongly Agree
2	AI tools improve my writing accuracy.	4.15	0.85	75% Agree/Strongly Agree
3	AI tools help me improve my sentence structure.	4.05	0.88	72% Agree/Strongly Agree
4	I feel more confident in my writing after using AI tools.	3.75	0.90	68% Agree/Strongly Agree
5	AI tools provide helpful suggestions for vocabulary improvement.	3.85	0.82	70% Agree/Strongly Agree
6	I find AI tools easy to use.	4.50	0.75	85% Agree/Strongly Agree
7	AI tools assist in improving my writing fluency.	3.80	0.84	73% Agree/Strongly Agree
8	AI tools help me improve the coherence of my writing.	3.45	0.95	65% Agree/Strongly Agree
9	AI tools are effective for detecting spelling mistakes.	4.30	0.76	82% Agree/Strongly Agree
10	AI tools help me develop my academic writing style.	3.65	0.92	70% Agree/Strongly Agree
11	I often rely too much on AI tools for writing corrections.	2.80	1.05	50% Disagree/Strongly Disagree
12	AI tools are not helpful in correcting stylistic errors.	2.90	0.99	45% Disagree/Strongly Disagree
13	I am satisfied with the feedback provided by AI tools.	4.00	0.85	75% Agree/Strongly Agree
14	AI tools improve my grammar knowledge over time.	3.55	0.90	68% Agree/Strongly Agree

15	I feel that AI tools can replace human feedback in my writing.	2.60	1.10	55% Disagree/Strongly Disagree
16	AI tools are useful for understanding the rules of academic writing.	3.70	0.92	72% Agree/Strongly Agree
17	I would prefer to use AI tools over traditional proofreading methods.	3.50	0.98	68% Agree/Strongly Agree
18	I would like to have more training in using AI tools for post-editing.	4.10	0.89	78% Agree/Strongly Agree
19	AI tools are not effective in improving overall writing quality.	2.85	1.03	50% Disagree/Strongly Disagree
20	I would recommend using AI tools for writing improvement to other students.	4.25	0.83	80% Agree/Strongly Agree

Key Findings from Descriptive Statistics:

- **Effective in Grammar and Accuracy**: The responses to items like "AI tools help me identify grammatical errors" (Mean = 4.25), and "AI tools are effective for detecting spelling mistakes" (Mean = 4.30) indicate that learners perceive AI tools as highly effective in addressing basic grammatical issues. A significant percentage (80%-82%) of respondents agreed or strongly agreed with these items.
- **Usability**: Learners expressed high satisfaction with the usability of AI tools, with "I find AI tools easy to use" scoring the highest mean (4.50) and 85% of participants agreeing with this statement. This suggests that learners find these tools accessible and user-friendly.
- **Writing Confidence**: Learners also reported a moderate improvement in their writing confidence, with a mean score of 3.75 for "I feel more confident in my writing after using AI tools." This result suggests that AI tools have a positive effect on students' self-perception of their writing abilities.
- **Limitations in Writing Quality**: Items related to more advanced writing skills, such as "AI tools help me improve the coherence of my writing" (Mean = 3.45) and "AI tools help me develop my academic writing style" (Mean = 3.65), received lower scores. This indicates that learners feel AI tools may be less effective in enhancing the quality of their writing in terms of coherence and academic style.

2. Factor Analysis

To uncover the underlying patterns in learners' perceptions of AI-assisted post-editing tools, a Principal Component Analysis (PCA) was conducted. This method is commonly used in social sciences to reduce data dimensions and identify latent variables that influence responses.

The PCA identified three factors, which together explained 68.1% of the total variance in the dataset.

Table 2: Factor Loadings for AI Tool Perception Items

	Grammar & Accuracy	**Usability & Confidence**	**Quality & Style)**
%Variance	40.5%	19.2%	8.4%

- **Factor 1: Grammar and Accuracy** (40.5% variance): Items related to grammar, sentence structure, and writing accuracy loaded highly on this factor. This factor highlights the learners' perception that AI tools are effective in improving basic grammatical aspects of their writing.
- **Factor 2: Usability & Confidence** (19.2% variance): Items focusing on the ease of use of AI tools and the learners' self-reported increase in confidence after using them were grouped under this factor. This suggests that learners associate AI tools with positive writing experiences in terms of accessibility and self-assurance.

- **Factor 3: Quality & Style** (8.4% variance): Items related to writing coherence and academic writing style clustered under this factor. Learners seem to perceive AI tools as less effective in improving these higher-order writing skills, as reflected in the lower factor loadings for these items.

3. Inferential Statistics

Inferential statistics were conducted to explore whether demographic variables, such as gender and academic year, had a significant impact on learners' perceptions of AI tools. Two tests were used: independent samples t-tests to compare the perceptions of male and female learners, and one-way ANOVA to assess differences based on academic year.

Table 3: Gender Differences in AI Tool Perceptions (Independent-Samples t-test)

Grouping Variable	t-value	p-value
Gender	-1.15	0.25

The results of the independent samples t-test show no significant differences between male and female participants on the survey items (p-value 0.25 > 0.05). The data suggests that gender does not influence learners' perceptions of AI tools in terms of their effectiveness, ease of use, or impact on writing confidence. Both male and female learners report similar levels of satisfaction with AI tools.

Table 4: Academic Year Differences in AI Tool Perceptions (One-Way ANOVA)

Grouping Variable	F-value	p-value
Academic Year	0.15	0.92

The results from the one-way ANOVA reveal no significant differences in learners' perceptions of AI tools based on academic year (p-value 0.92 > 0.05). This indicates that regardless of their year in university, learners from different academic levels have similar attitudes toward the effectiveness and usability of AI tools.

4. Correlation Analysis: Relationship Between AI Tool Perceptions and Writing Performance

To explore potential relationships between learners' perceptions of AI tools and their self-reported writing performance, Pearson's correlation analysis was conducted. The analysis aimed to identify whether positive perceptions of AI tools correlate with higher self-reported writing proficiency.

Table 5: Correlation Between AI Tool Perceptions and Writing Performance

		Perceptions	Writing Performance
Perceptions	Person Correlation		0.68**
	N	250	250
Writing Performance	Person Correlation	0.68**	
	N	250	250

*p < 0.05, **p < 0.01

The results of the Pearson correlation analysis show significant positive correlations between learners' perceptions of AI tools and their self-reported writing performance. This suggests that learners who perceive AI tools as effective in writing tend to report higher levels of writing proficiency.

5. Qualitative Responses: Challenges and Suggestions

In addition to the closed-ended questions, the survey also included open-ended questions where participants provided qualitative feedback on their experiences with AI tools. Common themes emerged from these responses, including challenges related to:

- **Limited support for advanced writing skills:** Many students mentioned that while AI tools are helpful for basic grammar and spelling, they struggle with providing support for advanced aspects of writing, such as coherence, logical flow, and academic style.

- **Overreliance on AI tools:** A number of respondents expressed concern about becoming overly reliant on AI tools for corrections, leading to a reduced focus on developing their own writing skills.
- **Need for more training:** Several learners indicated that they would benefit from more training on how to effectively use AI tools to improve their writing, particularly in terms of understanding the suggestions provided by the tools.

DISCUSSION

The results of this study provide valuable insights into the perceptions and challenges faced by Saudi EFL learners when using AI-assisted post-editing tools. The findings highlight both the strengths and limitations of AI tools in the context of language learning, particularly writing enhancement. The statistical analysis of the survey data reveals several key findings:

- **Perceptions of Effectiveness:** The majority of participants had a positive view of AI tools in terms of their ability to identify grammatical errors, improve writing accuracy, and enhance writing confidence. These findings align with previous studies that have shown that AI tools are perceived as helpful for basic language correction (Lee et al, 2024).
- **Limitations in Writing Quality:** Although students recognized the benefits of AI tools for technical aspects of writing, many were less convinced of their ability to improve higher-level writing skills such as coherence and academic style. This reflects the ongoing limitations of current AI technology in fully addressing the complexity of academic writing and this go in parallel with Selim (2024).
- **Impact of Demographic Variables:** The analysis revealed no significant differences in AI tool perceptions based on gender or academic year, suggesting that these factors do not substantially influence how learners view AI tools. This finding contrasts with some previous studies that found differences in technology acceptance based on demographic variables, like Daher & Hussein (2024) and Ofosu-Ampong (2023).
- **Correlation with Writing Performance:** There was a significant positive correlation between learners' perceptions of AI tools and their self-reported writing performance, particularly with regard to grammar and accuracy. This finding suggests that learners who use AI tools to address grammatical issues may experience improvements in their overall writing proficiency.

Recommendations and Pedagogical Implications

The findings from this study have several implications for educators and researchers in the field of language learning. First, educators should consider integrating AI-assisted post-editing tools into their teaching practices, particularly for grammar and spelling correction. Given the positive perceptions of AI tools for these purposes, they can serve as valuable aids in helping learners improve their writing accuracy. However, educators should also be mindful of the limitations of AI tools in enhancing higher-order writing skills, such as coherence and academic writing style. To address this, AI tools should be used in conjunction with traditional teaching methods, such as peer review and instructor feedback, to provide comprehensive support for writing development.

In terms of future research, studies could explore how AI tools can be improved to support more advanced writing skills. There is a need for further development of AI tools that can better assess and provide feedback on issues like argumentation, style, and cohesion. Moreover, longitudinal studies could investigate the long-term effects of AI tool usage on writing proficiency, especially in terms of learners' ability to transfer the skills gained through AI feedback to their independent writing practice.

CONCLUSION

This study has provided a detailed examination of Saudi EFL learners' perceptions of AI-assisted post-editing tools. The findings suggest that while learners find AI tools effective for improving grammar,

spelling, and writing confidence, they remain skeptical about their ability to enhance more complex aspects of writing. Moreover, learners expressed concerns about overreliance on AI tools and the need for more training in using these tools effectively. These findings contribute to the growing body of research on AI in education, highlighting both the benefits and limitations of AI-assisted language learning. Future research should focus on improving AI tools to address more complex writing tasks and explore ways to integrate AI feedback with traditional pedagogical methods for optimal writing development.

REFERENCES

Abalkheel, A. (2022). Amalgamating Bloom's taxonomy and artificial intelligence to face the challenges of online EFL learning amid post-COVID-19 in Saudi Arabia. *International Journal of English Language and Literature Studies*, *11*(1), 16-30.

AbdAlgane, M., & Jabir Othman, K. A. (2023). Utilizing artificial intelligence technologies in Saudi EFL tertiary level classrooms. *Journal of Intercultural Communication*, *23*(1).

Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, *2*(3), 431-440.

Al Mahmud, F. (2023). Investigating EFL students' writing skills through artificial intelligence: Wordtune application as a tool. *Journal of Language Teaching and Research*, *14*(5), 1395-1404.

Al Mahmud, F., & Ur Rahman, M. A. (2023). Academic Writing of Saudi Graduate Students: Issues and Improvements. *Arab World English Journal (AWEJ)*, *14*(1), 409-427.

Alasbali, A. A. et al (2023). Challenges of English Academic Writing among Saudi Higher Education Students. *International Journal of Academic Research: Business and Social Sciences, 13*(4), 1989-2004.

Alghamdy, R. Z. (2023). Pedagogical and Ethical Implications of Artificial Intelligence in EFL Context: A Review Study. *English Language Teaching*, *16*(10), 1-87.

Alhalangy, A., & AbdAlgane, M. (2023). Exploring the impact of AI on the EFL context: A case study of Saudi universities. *Alhalangy, AGI, AbdAlgane, M.(2023). Exploring The Impact Of AI On The EFL Context: A Case Study Of Saudi Universities. Journal of Intercultural Communication*, *23*(2), 41-49.

Alkubaidi, M. (2019). An action research on EFL writing dilemmas: A case of Saudi students and instructors. *Arab World English Journal (AWEJ) Volume*, *10*.

Alnasser, S. M. (2022). EFL Learners' perceptions of integrating computer-based feedback into writing classrooms: Evidence from Saudi Arabia. *SAGE Open*, *12*(3), 21582440221123021.

Ankawi, A. (2015). The academic writing challenges faced by Saudi students studying in New Zealand.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Daher, W., & Hussein, A. (2024). Higher Education Students' Perceptions of GenAI Tools for Learning. *Information (2078-2489)*, *15*(7).

Dong, Y. (2023). Revolutionizing academic English writing through AI-powered pedagogy: practical exploration of teaching process and assessment. *Journal of Higher Education Research*, *4*(2), 52.

Evenddy, S. S. (2024). Investigating AI's Automated Feedback in English Language Learning. Foreign Language Instruction Probe, 3(1), 76-87.

Gayed, J. M., Carlon, M. K. J., Oriola, A. M., & Cross, J. S. (2022). Exploring an AI-based writing Assistant's impact on English language learners. *Computers and Education: Artificial Intelligence*, *3*, 100055.

Hassan Seif Eldin, A. (2024). Using Artificial Intelligence in EFL Teacher Education Programs. *Sustainability Education Globe*, *2*(1), 26-35.

Indarti, D. (2024). Investigating the Metacognitive Strategies During Post-Editing Translation Process: An Application of Think-Aloud Protocols (TAP). *Journal of Languages and Language Teaching*, *12*(2), 765-778.

Jamshed, M., Alam, I., Al Sultan, S., & Banu, S. (2024). Using artificial intelligence for English language learning: Saudi EFL learners' opinions, attitudes and challenges. *Journal of Education and e-Learning Research*, *11*(1), 135-141.

Jiang, R. (2022). How does artificial intelligence empower EFL teaching and learning nowadays? A review on artificial intelligence in the EFL context. *Frontiers in Psychology*, *13*, 1049401.

Lee, Y. J., Davis, R. O., & Lee, S. O. (2024). University students' perceptions of artificial intelligence-based tools for English writing courses. *Online Journal of Communication and Media Technologies*, *14*(1), e202412.

Li, L., & Kim, M. (2024). It is like a friend to me: Critical usage of automated feedback systems by self-regulating English learners in higher education. *Australasian Journal of Educational Technology*, *40*(1), 1-18.

Li, R. (2020, November). Using artificial intelligence in learning English as a foreign language: an examination of IELTS LIULISHUO as an online platform. In *Conference Proceedings. Innovation in Language Learning 2020*.

Liu, C., Hou, J., Tu, Y. F., Wang, Y., & Hwang, G. J. (2023). Incorporating a reflective thinking promoting mechanism into artificial intelligence-supported English writing environments. *Interactive Learning Environments*, *31*(9), 5614-5632.

Marghany, M. M. (2023). Using artificial intelligence-based instruction to develop EFL higher education students' essay writing skills. *CDELT Occasional Papers in the Development of English Education*, *82*(1), 219-240.

Nazari, N., Shabbir, M. S., & Setiawan, R. (2021). Application of Artificial Intelligence powered digital writing assistant in higher education: randomized controlled trial. *Heliyon*, *7*(5).

Ofosu-Ampong, K. (2023). Gender differences in perception of artificial intelligence-based tools. *Journal of Digital Art & Humanities*, *4*(2), 52-56.

Rakya, Z. H. (2023). Exploring the impact of artificial intelligence (AI) on learner-instructor interaction in online learning (Literature Review). *International Journal of Emerging Multidisciplinary: Computer Science & Artificial Intelligence*, *2*(1), 1-14.

Rusmiyanto, R., Huriati, N., Fitriani, N., Tyas, N. K., Rofi'i, A., & Sari, M. N. (2023). The role of artificial intelligence (AI) in developing English language learner's communication skills. *Journal on Education*, *6*(1), 750-757.

Selim, A. S. M. (2024). The transformative impact of AI-powered tools on academic writing: Perspectives of EFL university students. *International Journal of English Linguistics*, *14*(1), 14.

Shaik, T., Tao, X., Li, Y., Dann, C., McDonald, J., Redmond, P., & Galligan, L. (2022). A review of the trends and challenges in adopting natural language processing methods for education feedback analysis. *Ieee Access*, *10*, 56720-56739.

Shibani, A., Knight, S., Kitto, K., Karunanayake, A., & Buckingham Shum, S. (2024, May). Untangling Critical Interaction with AI in Students' Written Assessment. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems* (pp. 1-6).

Shin, D., & Chon, Y. V. (2023). Second language learners' post-editing strategies for machine translation errors. *University of Hawaii National Foreign Language Resource Center*, *27*(1), 1-25.

Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology*, *14*, 1260843.

Thabet, M. A., & Qadha, A. M. (2024). The Influence of AI-Based Translation Tools on the Translation of Dr. Ghazi Al-Qusaibi's Poetry by Saudi EFL Learners. *Journal of Educational Sciences and Humanities,* (38), 772-799.

Triberti, S., Di Fuccio, R., Scuotto, C., Marsico, E., & Limone, P. (2024). "Better than my professor?" How to develop artificial intelligence tools for higher education. *Frontiers in Artificial Intelligence*, *7*, 1329605.

Tubino, L., & Adachi, C. (2022). Developing feedback literacy capabilities through an AI automated feedback tool. *ASCILITE Publications*, e22039-e22039.

Wale, B. D., & Kassahun, Y. F. (2024). The Transformative Power of AI Writing Technologies: Enhancing EFL Writing Instruction through the Integrative Use of Writerly and Google Docs. *Human Behavior and Emerging Technologies*, *2024*(1), 9221377.

Yu, E. (2023). Intelligent Enough? Artificial Intelligence for Online Learners. *Journal of Educators Online*, *20*(1), n1.

Zou, B., Reinders, H., Thomas, M., & Barr, D. (2023). Using artificial intelligence technology for language learning. *Frontiers in Psychology*, *14*, 1287667.