Unveiling the Role of Copilot in Enhancing EFL Learners' Writing Skills: A Content Analysis

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Abstract

As artificial intelligence continues to transform educational practices, understanding its learning implications has become increasingly important, particularly in language learning contexts. AI-powered tools such as Copilot can support English as a Foreign Language (EFL) students in multiple domains. Yet, there is a lack of understanding regarding how Copilot shapes the writing abilities of EFL students. To bridge this gap, this study examines the effectiveness of the Copilot tool in improving the writing skills of EFL learners in light of SCT. Following an exploratory-descriptive qualitative research methodology, data was gathered from 48 participants using content analysis. The intervention involved approximately eight weeks, during which the experimental group's students were instructed to complete their writing activities with the help of Copilot. In contrast, the control group did not use it. The results indicated that the Copilot application significantly improved the writing skills of EFL learners across multiple aspects compared to those who received traditional instruction. The findings suggest that educators should consider incorporating AI tools like Copilot into their curricula to create supportive writing environments, enhancing student engagement and writing proficiency. However, in order to ensure substantial language outcomes, dependence on AI tools must be balanced with conventional learning techniques. The study also encourages future research into innovative approaches to teaching, tools' long-term effects and broader applications in diverse educational contexts.

Keywords: Copilot, artificial intelligence, writing skills, EFL learners, educational technology, EFL Learning, content analysis

1. Introduction

Technology integration in education has transformed traditional teaching methodologies in recent years to meet the global needs (Akram et al., 2021, 2022). This paradigm shift is particularly pronounced in the context of EFL instruction, where digital tools such as writing assistants (Xu & Thien, 2025) and other AI-driven applications (Ma et al., 2024) are increasingly utilized to strengthen language learning (AbdAlgane & Jabir Othman, 2023; John & George, 2024). These technologies not only make instructional practices more effective (Liu & Ma, 2024), but they also foster learners' engagement (Aslam et al., 2021, 2022), develop collaborative learning atmosphere (Dai & Liu, 2024), strengthen learning experiences (Akram & Abdelrady, 2023, 2025), foster self-regulated learning (Al-Adwan et al., 2022), boost motivation (Muthmainnah et al., 2024), enhance language proficiency (Moussa & Belhiah, 2024), and improve EFL learning outcomes (Fan & Zhang, 2024).

Given the significance of English as a global language, its proficiency holds more importance now than ever before (Li & Akram, 2023, 2024). Furthermore, the ability to write proficiently in English becomes much more crucial in higher education (Shepard & Rose, 2023). Students at this level are supposed to complete a variety of academic projects and research theses as part of their degree requirements. Students who struggle with the English language frequently face difficulties in managing their academic matters (Ramzan et al., 2025). Therefore, being able to write in English is crucial for students to succeed academically in an EFL context. Since students from nations where English is regarded as a foreign language frequently struggle with the major obstacle of having few opportunities to utilize the language in their daily lives, which makes it difficult for them to practice and advance their language proficiency (Tao & Gao, 2022). A dearth of practical application chances stops students from acquiring writing abilities and applying the language in actual circumstances (Lin & Morrison, 2021).

In the meantime, Copilot emerged as an innovative AI-powered writing assistant established by Microsoft. It was formerly known as Bing Chat, an artificial conversational intelligence platform that was later rebranded as Copilot. Similar to ChatGPT, Copilot utilizes Large Language Model (LLM) technology, which was launched in 2023. Incorporating high advancement, this tool has demonstrated a significant role in enhancing language teaching and learning practices at different levels. It provides learners a personalized environment and helps

learners build their own chatbots to assist in their respective queries (Seo, 2024). Besides, its interactive features significantly enhance their level of enjoyment and keep them engaged (Alshraah et al., 2024). Its language assistance improves the communication skills of L2 learners (Kovačić & Bubaš, 2024). In another study, Al-Kadi and Ali (2024) support the use of Copilot for motivational learning. Despite this, a gap exists in understanding the role of Copilot in developing EFL learners' writing skills. This study thus intended to explore the following questions:

1. How does the application of the Copilot tool influence the overall writing skills of EFL learners?
2. What are the key differences in the writing patterns between the experimental and the control group?

2. Literature Review

2.1 EFL Teacher as a Stimulus for Transformative Learning in the Digital Age

Teachers are essential in shaping EFL students' minds, providing a universal cornerstone in the learning process throughout all subjects. Integrating innovative technologies, including writing styles, has become crucial to teaching and learning in today's landscape. Abdelrady & Akram (2022) suggest that their findings demonstrate coherence with the findings of previous research, which indicate that the availability of advanced technical applications, gadgets, and internet accessibility plays a key role in attaining students' academic achievement and learning satisfaction. This trend underscores the continuous incorporation of technology into instructional communication and signifies a significant advancement in the teaching process. According to Akram et al. (2022), authorities should address the needs and gaps that hinder educational practices from effectively integrating technology to acquire the maximum benefits from technology-integrated teaching and learning.

2.2 The Role of Copilot to Enhance Writing

Esfandiari and Allaf Akbary (2024) applied the Microsoft Copilot AI tool to Iranian EFL students in terms of assessing and practicing on a text made by EFL learners in the course of writing using the Data-Driven Learning (DDL) approach. They made EFL learners involved in the study by using Copilot to examine interactional meta-discourse markers (IMMs) in their writing feedback. The results favored the students who used Copilot's hands-on approach, as they provided more observable written feedback. They outperformed those exposed to traditional learning methods in recognizing and employing IMMs, which are essential for improving academic writing. This emphasizes that deeper interactivity with language construction can be promoted by AI techniques, resulting in better writing feedback achievement. Similarly, Al-Kadi and Ali (2024) conducted a study on GenAI tools and their effective role in enhancing teaching and learning the English language. They used three AI tools, Copilot, ChatGPT, and Gemini, with a holistic approach in order to provide in-depth insights into analysis. Several studies cited and supported the importance of these tools. The findings concluded that the third AI-powered tool helped in facilitating and consolidating teaching and learning practices. The study also recommended that English teachers and educators be updated to apply AI-generated tools in education. Recent findings and a literature review on Microsoft copilot and other AI-powered tools' effects on language competence suggest that using AI tools in EFL writing instruction can improve students' writing skills and motivation. Despite these tools giving basic benefits such as prompt feedback and personalized learning experiences, teachers need to execute them thoughtfully to reinforce their effect. By adopting an equivalent strategy that incorporates AI support with standard teaching practices, educators can more effectively help EFL learners refine their writing skills through feedback.

2.3 The Effectiveness of AI Writing Tools on Learners' Writing Feedback

In the same way, Seufert et al. (2021) explored how EFL students' academic writing abilities were developed through teacher and peer criticism combined with feedback from intelligent tutoring systems. The feedback provided by the intelligent tutoring system in an AI-assisted language learning environment significantly influenced the growth of the student's academic writing skills. To investigate the impact of an AI-based writing feedback tool on the writing performance of undergraduate EFL students, Hwang et al. (2023) carried out an experimental study with a control group. The findings showed that the experimental group performed better on writing tasks than the control group when using the AI-assisted tool. The AI tool's personalization aspect was essential in helping students edit and revise their writing tasks.

AI writing tools play a vital role in enhancing students' writing skills. A study was conducted by Widiati et al. (2023). They conducted an empirical study on how several types of AI writing tools enhanced students' writing abilities and feedback. They used a qualitative approach to handle this study via interviews with EFL teachers to explore what AI tools could improve students' writing skills. As EFL teachers have stated, employing many AI writing tools can enhance learners' writing competencies. For example, the use of QuillBot and WordTune is essential in teaching paraphrasing techniques and promoting sentence flow. Jenni AI can help students develop their intellectual abilities and critical thinking. On the other hand, Copy.ai and Essay Writer assist learners in being capable of writing in many different styles. ChatGPT effectively impacts students' engagement in developing speaking and writing skills. Based on this study, it can be indicated that applying multiple AI-powered writing tools is very important in promoting students' writing skills in particular and facilitating learning and teaching English as a foreign language in general. Another study, handled by Rahayu et al. (2023), boosted the impact of Artificial Intelligence in improving students' writing skills. The study indicated that using WordTune supported students in developing their writing abilities and gave real-time feedback.

2.4 Theoretical Background

This study is grounded in sociocultural theory (SCT) presented by Vygotsky (1978), which emphasizes the importance of interpersonal

interactions and technologies in educational pathways. At its core, the theory argues that learning occurs when individuals and their social surroundings interact dynamically, particularly while working together. Learners construct knowledge through mediated activities within their Zone of Proximal Development (ZPD), which accounts for a distinction between what they might achieve on their own and what they can accomplish with assistance. Engaging in collaborative language learning with the help of Copilot as a technological mediator enables learners to effectively reach their ZPD (see Figure 1). Ponman and Geetha's (2022) insights further showcase that EFL learners' ability to work independently in an ICT-driven learning context demonstrates their mastery of ZPD, which encourages their active participation in the educational process and proficient understanding. Affirming this, Poehner and Lantolf's observation (2021) illustrates how students are encouraged to become self-directed learners in English classes by combining ZPD with ICT.

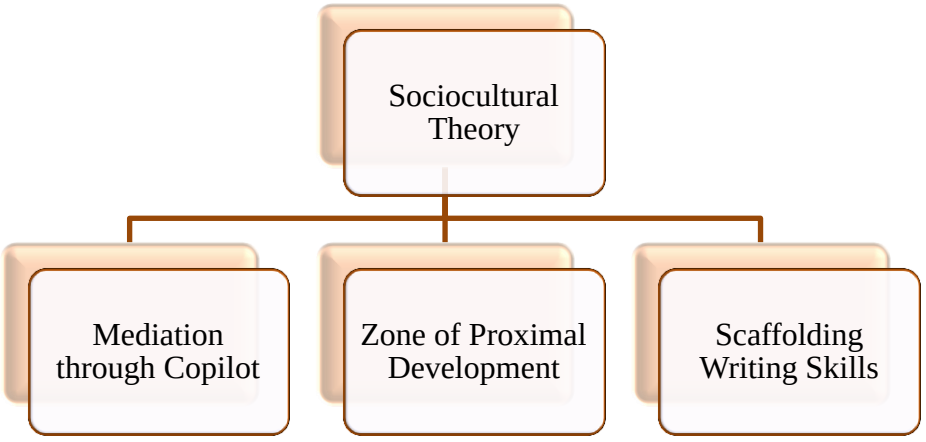

Figure 1. Conceptual framework

In addition, Copilot is not just a tool but a more capable peer that provides immediate, context-sensitive feedback, guiding students toward higher-order writing abilities. Several studies have demonstrated how digital tools act as mediational agents in L2 learning environments. Using an experimental study, Narayanan and Kumar's study (2019) specified that the machine translation tool serves as a scaffold for EFL learners in India. Aligning with this, Madhavi et al. (2023) observed that digital tools offer scaffolding that helps learners move toward more independent and sophisticated learning. Shepard and Rose (2023) further assert that students frequently gain significant advantages from social contact in EFL classes, which helps them improve their speaking and writing abilities. SCT's conceptualization emphasizes the importance of the ZPD, which allows learners to achieve progress with the help and collaboration of more competent peers. In modern learning environments, AI tools serve as more capable peers (Al Ghaithi et al., 2025), guiding learners through the writing process by suggesting revisions and offering immediate feedback and assistance similar to peer support (Esfandiari & Allaf-Akbary, 2024). Engaging with such tools, learners take part in interactive exchanges while also receiving a competent and adaptable digital companion (Akram & Li, 2024). While Copilot is traditionally seen as a customized learning application, our investigation dives into its possibilities for its contribution to writing skill development by nurturing a sense of collaboration and social engagement among learners (John & Anna, 2024). This combination of social constructivism and artificial intelligence is a prerequisite because it allows for the investigation of the possible overlap between established learning theories and new technologies. By leveraging AI capabilities, learners can benefit from a collaborative learning environment, potentially increasing their efficacy in language learning and writing proficiency.

3. Materials and Methods

The present study employed an exploratory-descriptive qualitative methodology to examine the writing proficiency of EFL learners in Saudi Arabia concerning the use of the Copilot application. This approach involves exploring a specific topic and identifying key themes (Stevens & Wrenn, 2013). Using this approach, a content analysis technique was integrated to provide a nuanced understanding of the potential benefits and challenges associated with integrating such AI tools in EFL education. Content analysis is a systematic method for evaluating extensive texts, communications, or speeches and categorizing them into distinct themes (Drisko & Maschi, 2016). Following meticulously, this approach allows researchers to analyze the potential traits, strengths, and patterns in certain texts efficiently.

3.1 Research Participants

A purposive sampling method was used to choose the required participants. According to Rai and Thapa (2015), this approach helps to choose participants based on specific characteristics that align with the research objectives. Following this strategy, a sample of 48 EFL learners from a Saudi Arabian University was recruited. The study participants were female students aged 18 to 22 in their second year of undergraduate studies, divided into two groups: experimental and control groups. The experimental group consisted of 24 students who used the Copilot interface to complete writing activities over eight weeks in the first semester of 2024, whereas the control group consisted of half of the students who did not utilize any AI platforms. These activities included a range of tasks, such as essays and creative writing, to enhance their writing skills.

3.2 Measure

The written test was selected as the study's instrument across both samples, i.e., learning with Copilot users and learning without using any AI platform, because it enables the examination of learners' writing processes, style adaptation, and overall proficiency (Inoue, 2015). To generate a more genuine writing sample, all the students were instructed to write a 200-word passage any one of three topics, i.e., the advantages and disadvantages of the internet, your favorite hobby, and how you spent your last holiday. Each student was given 30 minutes to complete their writing task in a classroom setting under identical conditions.

3.3 Ethical Considerations

The study adhered to all ethical standards in accordance with the Declaration of Helsinki (World Medical Association, 2013), which are universally accepted guidelines for human research. Moreover, participants were thoroughly briefed about the nature and scope of the research as well as the academic analysis of their written texts. Their participation was completely voluntary, and was guaranteed the anonymity of their responses and writing samples. In addition, written informed consent was taken from the participants after explaining the objective of the study. They were also informed of their freedom to discontinue and withdraw from the study at any time without any academic or personal repercussions. Likewise, their anonymity was preserved by assigning coded identifiers to each participant, and no personal or identifiable information was collected or disclosed in the reporting of results.

3.4 Data Analysis

Following the framework laid out by Saldaña (2021), the study followed the following important steps to analyze the data (see Figure 2):

1. Identification

Understanding writing patterns is an essential part of analyzing content. This step involves a detailed analysis of the data to determine the participants' strengths and weaknesses. Their writing samples were assessed from both samples as part of this study and observed a variety of writing skills (e.g., grammar, structure, vocabulary usage). They were then highlighted to make those elements more evident.

2. Classification

The second phase entails classifying each of the study's major themes. This stage is essential since it helps find the most prevalent elements of writing structure as well as trends and patterns in the data. Subsequently, we meticulously categorized all of the writing samples according to their different forms into all of the important linguistic structure components that were supplied.

Figure 2. Saldaña's (2021) approach for data analysis

3. Tabulation

The third step facilitated a thorough analysis of the data and allowed for the extraction of valuable insights for future research. In this stage, a comprehensive table was created that showed all the key incidents falling under each key aspect. The table gave a clear visual representation of how the key incidents were spread across different categories. By identifying the major strengths and problems, the study was able to arrive at research findings.

4. Calculation

In the last phase, a thorough examination of the important elements was carried out. This involved figuring out the proportion of significant incidents that students made overall and within each particular category. These analyses revealed writing proficiency in both samples, offering important insights into the scope of the process. The data was further enhanced through meticulous processing, which helped to provide a thorough evaluation of the findings of the study.

3.5 Trustworthiness of the Instrument

Trustworthiness, also known as the degree of reliability of the study's conclusions, is a critical component of a content analysis. According to Creswell & Creswell (2017), for an instrument to be considered useful, it must have both validity and reliability. Furthermore, Noble and Smith (2015) stress how important inter-coder reliability is, particularly when working with open-ended research questions. Three peers and

two specialists in related fields were chosen to assess the coding process in order to guarantee the reliability of the coding methodology and study results. Although it deviates from the cutoff point stated by O'Connor and Joffe (2020), the degree of agreement between these investigators and subject-matter authority surpasses 80%, indicating a satisfactory degree of reliability. Furthermore, the study adhered to all ethical guidelines to ensure the anonymity of the participants. After confirming the validity and reliability of the analysis process, a consent letter and the content analysis test were presented to each participant in the study. Additionally, steps were taken to guarantee that the content analysis process was reliable and followed established research protocols.

4. Results

After careful assessment of the writing cases, the study identified several prevalent key aspects across both samples (see Figure 3). This radar chart visually compares the performance of an experimental group and a control group across eight key writing aspects: Coherence and Organization, Style, Grammar, Vocabulary, Structure, Punctuation, Spelling. For the control group, scores across all aspects cluster in the 2.0–2.5 range. This indicates that, on average, the control group demonstrated limited writing proficiency. Their performance shows only basic or ordinary command of elements like grammar, vocabulary, and coherence, with no single area standing out as particularly strong. In contrast, the experimental group (shown by the blue polygon) achieved scores above 4.0 in every category. It demonstrates that Copilot application effectively enhanced students' writing.

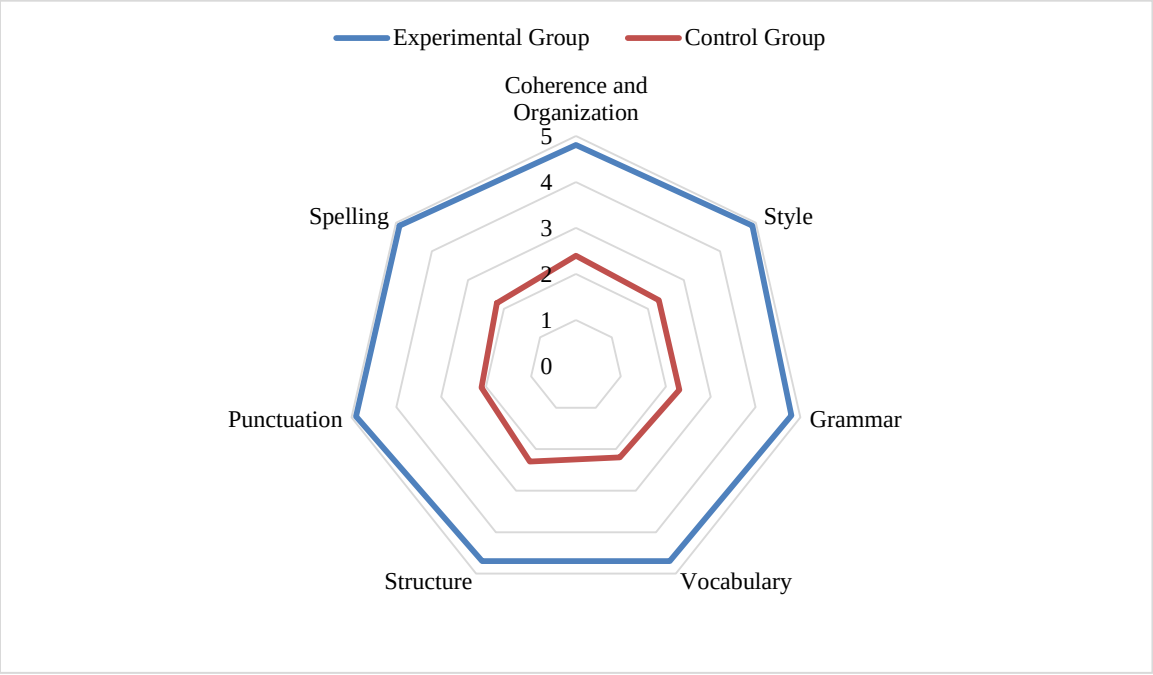

Figure 3. Radar chart overview illustrating writing proficiency across groups

4.1 Coherence and Organization

According to the findings, the control group's writing samples generally maintained a clear structure, comprising an introduction, body, and conclusion, but the transitions between paragraphs were often weak, resulting in a disjointed flow of ideas. In contrast, the samples from the experimental group, which utilized the Copilot interface, demonstrated superior coherence and organization. The structure of essays was more effective, facilitating smoother transitions and a logical progression of ideas among them. This improvement highlights the Copilot's role in enhancing the overall coherence and organizational quality of the students' writing. The examples for both groups are shown below:

Control Group:

> *"Reading new books is my favorite hobby. I feel relaxed after reading. It is a good way of passing time. I can learn so many things by reading."*

Experimental Group:

> *"Reading also allow a sense of escape and relaxation. Besides, it allows readers to unwind from daily stress, offering a peaceful retreat into the world of words. For some it is solitary journey, while others find joy in book clubs and discussions."*

4.2 Style

Upon analyzing the students' writing styles, the control group's compositions were characterized by basic and repetitive patterns, with limited variation in sentence structures and vocabulary, leading to a monotonous reading experience. In contrast, the experimental group, which utilized the Copilot tool, exhibited a more engaging and varied writing style. The Copilot application encouraged the use of diverse sentence structures and a richer vocabulary, significantly enhancing the overall readability and appeal of the essays. This variation not only

made writing more dynamic and interesting but also demonstrated the potential of AI-assisted tools in fostering improved writing skills among learners. Examples of both groups are provided below:

Control Group:

"Reading is better. I usually go to the public library in my town. I read books there. My friend Gemmy always comes with me."

Experimental Group:

"Reading enhances cognitive skills, vocabulary, and empathy. It challenges the mind and broaden the horizons, fostering a lifelong love for learning. Weather enjoying a classic on a cozy evening or exploring a modern bestseller on a sunny day, reading is a hobby that enriches the mind and soul."

4.3 Grammar

Analyzing grammatical aspects, the control group frequently encountered grammatical problems including incorrect verb tenses, subject-verb agreement, and article usage. These persistent errors significantly detracted from the overall quality of their writing. Conversely, the experimental group, which utilized the Copilot tool, demonstrated enhanced accuracy in the use of verb tenses, subject-verb agreement, and articles. This improvement not only elevated the overall quality of the students' writing but also underscored the efficacy of AI-assisted applications in addressing common grammatical challenges. Some instances of both groups are provided below:

Control Group:

"The last holiday wasn't good for me, it was a badest holiday in my life, although I didn't do anything (not reading, not drawing and not learning)."

Experimental Group:

"Last holiday, I immersed myself in the joy of exploration and learning. Though I cant physically travel, I ventured through digital realms, uncovering fascinating facts about the world's hidden gems."

4.4 Vocabulary

Regarding vocabulary, the usage of control group's vocabulary was basic and limited, with students frequently repeating the same phrases and struggling to incorporate more advanced vocabulary into their writing. In contrast, the experimental group demonstrated a significant enhancement in their vocabulary usage. These students employed a greater variety of words and selected vocabulary that was more contextually appropriate, thereby enriching their essays and contributing to a more sophisticated and nuanced writing style. This improvement underscores the effectiveness of the Copilot tool in expanding the lexical resources of EFL learners and enhancing the overall quality of their written work. A few instances for each group are shown below:

Control Group:

"My favorite hobby is reading stories and novels because it has some advices to me and other readers. I love reading story."

Experimental Group:

"The holiday was a blend of adventure and creativity, a perfect escape from routine. It reinforced my love for learning and the endless possibilities it offers. Every moment was filled with discovery and inspiration, making it a memorable experience that will stay with me."

4.5 Structure

Analyzing the structure of the sentences, distinct differences in their organizational quality were observed. The control group adhered to a basic structural framework; however, their essays often lacked depth in paragraph development. Topic sentences were occasionally unclear, and transitions between paragraphs were weak, resulting in a disjointed flow of ideas. In contrast, the experimental group wrote well-structured essays characterized by clear topic sentences and cohesive paragraph development. Each paragraph effectively contributed to the overall argument or narrative, demonstrating a logical progression of ideas and a more sophisticated organizational structure. This contrast highlights the Copilot tool's role in enhancing the structural quality of students' writing, fostering clearer and more coherent essays. The examples for both groups are shown below:

Control Group:

"My favorite hobby is going to shopping with my family for buy new clothes and materials cooking. My favorite hobby is riding horses with my brother at the farm."

Experimental Group:

"We traveled to the mountains during our semester break. The journey took six hours, but the view was worth it. Each day had a new adventure, hiking, exploring, or simply enjoying the sunset."

4.6 Punctuation

With respect to punctuation, errors were more common in the writing of the control group than in that of the experimental group. The

misuse of commas, periods, and other punctuation marks significantly hindered the readability and overall quality of their essays. On the other hand, the experimental group demonstrated significant improvements in punctuation usage, showing a polished version and easier to read. This improvement underscores the tool's effectiveness in enhancing the technical aspects of writing, contributing to a more professional and refined final product. Examples of both groups are:

Control Group:

> *"Internet is a great invention of this century it has reformed several areas around the world for example online shopping online learning and online trading."*

Experimental Group:

> *"The internet has profoundly reshaped the landscape of modern life, bringing both remarkable benefits and notable challenges. On the plus side, the internet democratizes access to information, enabling individuals from all corners of the globe to learn and grow in unprecedented ways."*

4.7 Spelling

Analyzing the spellings, the control group demonstrated a higher number of spelling mistakes in their writings. These errors, while occasionally hindering comprehension, primarily detracted from the overall professionalism and polish of the writing. In contrast, the experimental group demonstrated a significant reduction in spelling mistakes. This improvement not only enhanced the precision of their writing but also contributed to a more professional and polished appearance of the essays. A few instances for each group are presented as follows:

Control Group:

> *"My holiday was very interesting and cool. I spend my holiday in Eygpt with my father and mother. We visited several places. We wnet to the largest library in Eygpt and visited the king Farooq's garden."*

Experimental Group:

> *"My trip to Alexandria with my parents was a delightful blend of history, adventure, and family bonding. Arriving in this historic Mediterranean city, we were greeted by a perfect mix of modernity and ancient charm."*

5. Discussion

Technology integration in education has transformed traditional teaching methodologies in recent years, significantly impacting language learning and acquisition. This paradigm shift is particularly pronounced in the context of EFL instruction, where digital tools such as writing assistants and AI-driven applications are increasingly utilized to enhance linguistic skills. In Saudi Arabia, the growing demand for English proficiency, fueled by economic diversification efforts and globalization, has prompted educators and policymakers to explore innovative approaches to English language teaching. The advent of AI-powered tools like Copilot represents a pivotal development in language education, offering learners personalized, interactive, and context-sensitive support. The study thus provides a detailed insight regarding the Copilot tool's practical application in light of SCT in enhancing Saudi EFL learners' writing skills. The findings underscore the effectiveness of Copilot in enhancing the writing quality across multiple aspects, including coherence, organization, style, grammar, vocabulary, structure, punctuation, and spelling accuracy. This insight corresponds with Zhang & Hyland's (2023) observation, which highlights a significant role of AI-assisted writing tools in strengthening students' writing abilities. In line with this, Zhao (2023) recommends using AI platforms to help language learners write more effectively because they offer real-time feedback. Similarly, the application of Copilot in English language writing tasks yielded several notable benefits across multiple aspects.

Regarding coherence and sentence structure, the experimental group demonstrated improved consistency and organization in their writing. Coherence is a strong indicator of writing proficiency, which informs how ideas are logically connected and develop throughout a text. Chatbots and other AI-supported tools can also help in maintaining coherence, ensuring appropriate transitions, helping to reorganize the writing, and providing prompts for maintaining the logical flow (Song & Song, 2023). This result is in line with the findings by Moussa and Belhiah (2024), who contend that ChatGPT assists in enhancing coherence by providing structural suggestions and reinforcing arguments. Hence, teachers are advised to use AI tools as a pre-writing brainstorming guide to help with the organization of thoughts before writing. They should also train students on how to evaluate AI-generated recommendations critically to strike a balance between coherence and originality.

In addition, results also disclosed a notable improvement in students' writing style in the experimental group. Writing style is another important aspect of writing skill, which involves adding variations to sentences to get more vivid text (Arsyad & Adila, 2018). Literature further suggests that Chatbots are likely to facilitate language learners in improving their writing style by suggesting adding variations in sentences (Pitychoutis, 2024). In line with this, Guo and Li (2024) recommend using self-made chatbots to enhance learners' writing fluency as well as their lexical creativity, which are considered the key aspects of advanced writing proficiency. Given these, learning practices ought to integrate AI-powered solutions that allow students to get real-time feedback as they are writing essays, which should be further supplemented by the instructor's feedback to examine the developments.

Academic writing further depends on precise grammar and syntax to make certain that statements are readily understood and are not nonsensical or vague. The findings indicated that the writing of students in the experimental group showed significant improvement in

grammar accuracy. This result supports the findings of Toscu (2024), who emphasizes the value of chatbots in helping language learners by decreasing grammatical errors. A possible reason might be that AI-based writing tools offer instant feedback, which allows students to identify their grammatical errors and enhance their interest. Aligning with this notion, Abdelrady and Akram's (2022) study illuminated an effective role of the instant response system in strengthening EFL learners' learning experiences. In this regard, teachers are advised to encourage students to give their reflection on corrections received from the AI program to strengthen their understanding.

Vocabulary acquisition pertains to another crucial aspect of EFL writing performance, which also affects students' speaking skills. The prominence of vocabulary usage was observed to be greater in the experimental group than the control group, demonstrating the significance of AI-driven applications in language learning. Our findings are corroborated by Duong and Chen's (2025) study, which shows that students' engagement with chatbots positively affects their vocabulary acquisition. Waziana et al. (2024) also affirm that AI chatbots enable learners to bring diversity of vocabulary in their writing. Hence, students should be encouraged to make creative use of AI platforms to expand their lexis knowledge. Teachers should also utilize vocabulary-building activities with the help of AI platforms to examine their acquisition.

A large decrease in punctuation and spelling mistakes in the experimental group further reveals the importance of Copilot's automated error detection. Punctuation, in particular, proves to be a difficult task for EFL students, as it involves knowledge of syntactic rules that can vary from their language of origin (Khan, 2022). AI-based tools address this void by offering immediate corrections, conditioning correct use in the long run. Related results were presented by Al Ghaithi et al. (2025), in which AI-based spelling and punctuation checkers drastically diminish surface-level errors in EFL learners' text generation. The immediacy of feedback fosters self-correction practices in students, leading to long-term improvement in writing. Corresponding with SCT, the observations found in the study suggest that learners were operating within their Zone of Proximal Development (ZPD), where Copilot acted as a more knowledgeable peer or teacher. Through continuous guidance, Copilot helped students become more proficient writers and helped them gradually internalize academic writing standards. The findings also reflect the internalization process described in SCT, wherein external support transforms into competence over time. This scaffolding effect aligns with Liu et al's (2022) assertion that digital tools can serve as cognitive agents in the learning process, allowing students to monitor their progress. Furthermore, the enhancement in multiple aspects of English writing also supports learners' engagement and autonomy in working with Copilot. Meaningful engagement, according to SCT, not only develops learners' skills but also plays a key role in enhancing learner agency. This reflects a move from other-regulation to self-regulation, a fundamental developmental pathway according to Vygotsky. Therefore, AI-powered tools should be incorporated into editing and proofreading exercises to allow students to hone their own error-checking abilities.

6. Limitations and Future Studies

Although the findings of the present study advance knowledge about how Copilot can contribute to learners' EFL writing skills, the following limitations are recognized. Firstly, the research used a restricted sample of a small group size, due to which results cannot be generalized adequately. In future studies, a more heterogeneous sample of participants, e.g., students from various institutions or cultural backgrounds, should be recruited to better investigate the overview of the use of AI-assisted writing tools. Secondly, the study was limited to second-year students, so it may not be wholly reflective of how students at other levels interact with these tools. Further research could investigate differences at various language levels. Another weakness is that this study only adopts content analysis to evaluate students' writing progress. Although this approach provided a detailed perspective of text features, it did not include triangulated information from interviews or learners' reflections. Implementing those designs (or other similar designs) in future research would yield a broader picture of what students do when they engage with the tool. In addition, although a nuanced qualitative experimental design was adopted, which limits the strength of causal inferences. Future research could adopt a mixed-methods design, combining both quantitative and qualitative methods to enhance the reliability of findings.

7. Conclusions

The transformations in the field of technology highlight the potential long-term implications of AI-assisted writing in the writing industry. Given this, the present study figured out the role of Copilot in strengthening EFL learners' writing skills through SCT's lens. The findings suggest that Copilot served as a digital scaffold tool that guides learners through their Zone of Proximal Development (ZPD) by offering immediate language support, illuminating several notable benefits and some limitations. Firstly, Copilot enhances grammar, syntax, and overall writing quality, significantly contributing to improved clarity and readability. Additionally, Copilot ensures consistency in style and tone, thereby creating a cohesive reading experience. The tool also streamlines the writing process, allowing EFL learners to concentrate on higher-level creative decisions rather than being bogged down by the mechanics of writing. Furthermore, Copilot can help generate fresh ideas, making it an invaluable resource for creative endeavors. However, several limitations should be acknowledged. Over-reliance on AI tools could impede the development of learners' writing skills. While Copilot offers useful suggestions, they may not always align perfectly with the learner's intent or context, potentially leading to misunderstandings. Therefore, while Copilot is a powerful tool, it should be employed thoughtfully to complement rather than supplant human creativity. The use of AI-assisted writing tools like Copilot significantly enhances the writing experience for EFL learners by providing suggestions, correcting grammar, and improving style. The findings therefore recommend employing some pedagogical interventions to overcome EFL learners' challenges and improve their writing skills with the help of AI platforms. However, reliance on AI tools must be balanced with traditional learning methods to ensure comprehensive language development. Integrating the Copilot tool in EFL writing instruction demonstrates promising results in enhancing writing styles. Future research should explore the long-term effects and the application of such tools in different language-learning contexts.

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