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Exploring undergraduate students' usage and perceptions of AI writing tools

Elias Bensalem [a1], Northern Border University, Saudi Arabia, bensalemelias@gmail.com
Radhia Harizi [b], Northern Border University, Saudi Arabia, Rafifradhia@gmail.com
Amel Boujlida [c], Northern Border University, Saudi Arabia, amelb.graa@hotmail.com

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Abstract

Artificial intelligence (AI) technologies have seen significant integration in various fields, particularly in higher education. The current study aims to explore the extent of students' usage patterns of AI writing tools, their overall experience of using AI writing tools, and challenges and concerns about using AI writing tools. In addition, the study aims to examine the ways AI writing tools have affected students' writing skills and features or improvements that they would like to see in AI writing tools to enhance their writing experiences. A survey of 161 undergraduate students from a public university in Saudi Arabia revealed the widespread and regular use of AI writing tools for written assignments. In addition, the majority of participants reported their adoption of AI tools, citing their convenience and efficacy in enhancing writing proficiency. However, qualitative analysis of the participants' learning experiences revealed concerns regarding the potential negative impact on the development of writing skills and ethical considerations. In light of the findings, researchers discuss pedagogical implications.

Keywords: Artificial Intelligence (AI); AI writing tools; EFL students; students' perceptions.

* ADDRESS FOR CORRESPONDENCE: Elias Bensalem, Northern Border University, Saudi Arabia
E-mail address: bensalemelias@gmail.com

1. INTRODUCTION

Artificial intelligence (AI) refers to computer systems that can perform complex tasks that normally require human intelligence, such as making decisions, language translation, and speech recognition (Russel & Norvig, 2010). AI is a rapidly developing field that has revolutionized modern society by influencing different domains, including education (Makridakis, 2017; Cope et al., 2020; Jia et al., 2022). AI tools enable personalized learning tailored to individual needs and enhance content (Ruiz-Rojas et al., 2023). In the field of second language learning, AI has the potential to open windows of learning opportunities for students, making learning a foreign language an engaging and dynamic experience (Woolf et al., 2013). The introduction of AI writing tools has completely changed how students approach assignments and writing projects, making their tasks more efficient (Gustilo et al., 2024). Students can now create, edit, and polish written content more quickly and easily than ever before using these tools powered by sophisticated natural language processing algorithms.

However, over-dependence on AI reduces the cognitive ability of the students (Zhai et al., 2024). While some research (Kurniati & Fithriani, 2022; Wang et al., 2022; Zhao, 2022) suggests that students can write more effectively by utilizing AI-powered writing tools, other studies (Liu et al., 2022; Lund & Wang, 2023; Qadir, 2022) have raised concerns about the tools' possible drawbacks. GenAI may pose a threat to academic integrity since even detection methods like ZeroGPT may not effectively identify content produced by ChatGPT (Chan & Hu, 2023; Perkins, 2023; Elkhatat et al., 2023; Ibrahim, 2023). There was even an emergence of AI detector and humanizer tools such as AI Humanizer and Humanize AI Text that help modify content to make it appear to be written by a human. The fact that GenAI tools are unable to produce objective results free of fabrications and correct references (Lund & Wang, 2023) may be more concerning. In addition, over-reliance on GenAI tools may compromise students' capacity to develop proper writing skills (Warschauer et al., 2023) and negatively impact their creativity and autonomy (Smith, 2023).

To successfully integrate these technologies into language education programs and enhance language learning results, it is essential to comprehend students' experiences with AI technology (Chen & Wei 2021; Sun & Hoelscher, 2023). However, because of the recent release of important tools like ChatGPT (Strzelecki, 2023), there is a dearth of studies on the usage of writing tools and their perceived effects on students' writing abilities. By eliciting students' perspectives, educators and policymakers can address these concerns and develop guidelines and frameworks that promote the ethical and responsible use of AI writing tools in education (Escalante et al., 2023).

1.1. Literature review

1.1.1. Students' use of AI writing tools

Most of the research that examined AI writing tools focused on their use and impact on students' writing. AI-powered writing tools, such as grammar checkers, style analyzers, and content generators, have become ubiquitous in educational settings, offering students instant feedback and support in their writing endeavors (Malik et al., 2023; Evmenova et al., 2024). These tools not only assist in detecting grammatical errors and syntactical issues but also provide suggestions for improving clarity, coherence, and stylistic consistency in writing (Malik et al., 2023). Furthermore, ChatGPT and other AI-powered technologies can help students create material and offer recommendations for improved vocabulary and sentence patterns (Marzuki et al., 2023). By automating routine tasks and offering real-time guidance, AI technologies enable students to focus on higher-order thinking skills, such as critical analysis, argumentation, and creative expression (Dwivedi et al., 2023).

Research has indicated that artificial intelligence (AI)-driven language learning instruments have the potential to facilitate language acquisition, specifically about writing abilities (Chang et al., 2021; Dwivedi

et al., 2023; Klekovkina & Denié-Higney, 2022; Liu et al., 2021; Gayed et al., 2022). Das et al., (2023) found that students who utilized AI-based writing tools showed improvements in writing quality, accuracy, and coherence compared to those who relied solely on traditional methods. Liu et al., (2021) have demonstrated that AI-powered writing assistants improve students' writing fluency, productivity, and overall writing proficiency. These findings are consistent with those of Chang et al., (2021) and Reis and Huijser (2016), who demonstrated that Grammarly offered more comprehensive feedback and practical functions for English writing.

1.1.2 Students' perceptions of the use of AI writing tools

Given the recent introduction of AI writing tools in education, there is a dearth of studies regarding students' perceptions of the use of such AI tools (Smith & Johnson, 2023). In a study that examined the perceptions of generative AI (GenAI) technologies on 399 students from different fields in Hong Kong, Chan and Hu (2023) found that participants reported a positive attitude towards tools such as ChatGPT since they used it as a writing assistant, which helped them in brainstorming and writing. Specifically, researchers reported that such a tool was useful because it provided students with feedback on their writing, which resulted in better writing skills. Similarly, Fithriani's (2023) study reported positive perceptions, indicating that English major students thought QuillBot was helpful. A popular AI writing assistant, helped them overcome their writing difficulties and improve their writing skills. They appreciate the capability of QuillBot to improve content, minimize grammatical errors, and enhance language usage in their manuscripts.

Other studies explored the perceptions of students regarding the use of AI-powered tools such as Google Translate and Grammarly (Lee, 2019; Lee, 2020; Lee & Briggs, 2021; Kim & Han, 2021). Overall, the perceptions were positive. O'Neill and Russell's (2019) study indicated that college students responded favorably to Grammarly's grammar comments, finding the tool to be both easy to use and helpful. According to Reis and Huijser's (2016) research, Grammarly offered more comprehensive feedback and practical features for writing in English. According to Reis and Huijser (2016), it provides more thorough feedback as well as useful features for writing in English.

According to Jeong's (2021) research, language learners felt more at ease utilizing automatic translators like Google Translate, which helped their English writing skills. In a more recent study, Lee et al., (2024) reported positive perceptions of Korean college students regarding Google Translate since they found it especially helpful for improving their vocabulary, translating, employing complex idioms, understanding grammar, and becoming proficient writers in English. In addition, many Korean students thought that Grammarly helped them learn idioms or structures thanks to the feedback provided by the tool. They appreciated the capability of this tool to spot and fix errors (Fahmi & Cahyono, 2021).

However, some participants reported incorrect translations as well as strange idioms or grammatical constructions. Some students also need assistance honing their English writing abilities and are concerned about becoming unduly reliant on AI-based solutions. Other researchers focused on the perceptions of college students about the ethical use of AI writing tools, namely ChatGPT (Dwivedi et al., 2023). For instance, Črček and Patekar (2023) revealed that some students acknowledged the fact that using ChatGPT to write an assignment is unethical since it is a form of cheating. Despite the growing body of literature on AI and writing, there remain gaps in understanding the nuanced effects of AI on student writing practices. This study aims to fill these gaps by capturing students' perspectives and experiences with AI-powered writing tools.

1.2. Purpose of study

The research gap addressed in this study pertains to the evolving landscape of writing instruction amidst the integration of Artificial Intelligence (AI) technologies. While existing literature acknowledges the

increasing adoption of AI writing tools, there remains a dearth of studies examining students' perceptions and attitudes toward these technologies. Prior research has predominantly focused on the technical aspects and functionalities of AI tools, overlooking the nuanced perspectives of end-users, particularly students. Consequently, there exists a notable gap in understanding how students perceive and utilize AI tools in their writing processes, as well as the broader implications for teaching. This study seeks to bridge this gap by conducting a mixed methods analysis to elucidate students' perspectives on AI's influence on writing proficiency, thereby contributing to a more holistic understanding of the role of AI in contemporary writing instruction. The following research questions will guide the current study:

RQ1. To what extent do students use AI writing tools? What are the most frequently used tools by students?

RQ2. How do participants perceive their overall experience of using AI writing tools? How do students perceive the impact of using AI writing tools on their writing skills?

RQ3. What are the perceptions of students regarding the potential challenges and concerns of using AI writing tools?

2. METHODS AND MATERIALS

2.1. Participants

The researchers recruited through snowball sampling 161 students (102 females and 59 males) from different majors, namely English, medicine, engineering, and computer science, at a public university in Saudi Arabia. Respondents' ages ranged from 18 to older than 29, with the majority falling within the 18–21 (46.0%, n = 74) and 22–25 (42.9%, n = 69) age brackets. Most of the participants were 45 freshmen (28%), followed by 42 seniors (26.1%), 38 juniors (23.6%), and sophomores (23.6%). The demographics of the participants are presented in Table 1. Data collection took place via an online survey during the fall semester of 2024. We utilized a convenience sampling approach to recruit participants, considering their accessibility and willingness to respond to the survey. Participants were recruited using WhatsApp groups.

2.2. Data collection instrument

In this study, the researchers used a composite survey to investigate the students' AI readiness and attitudes toward the impact of AI tools on their writing skills. The survey items were adapted from the "Technology Acceptance Model" (TAM) by Davis (1989) and the "Unified Theory of Acceptance and Use of Technology" (UTAUT), which was formulated by Venkatesh et al., (2003). These models offer reliable measures that ensure accuracy in assessing attitudes, challenges, and outlooks regarding AI writing tools. The participants completed a survey consisting of 17 closed-ended and open-ended questions. The closed-ended questions of the survey covered topics related to familiarity with AI writing tools, usage, challenges, and concerns about the impact of AI on writing skills. One survey item measured students' frequency of using AI writing tools. Other items employed a 5-point Likert scale ranging from "strongly agree" to "strongly disagree." The two open-ended questions collected additional insights to complement the data gathered from the multiple-choice questions. According to Creswell & Plano (2012), the questionnaire has a few open-ended questions that allow the researcher to investigate the rationale behind the closed-ended answers and find any additional remarks that participants may have. To generate more responses, we made the survey available in both Arabic, the native language of participants, and English.

2.3. Data analysis

To analyze the quantitative data from 161 students, we calculated descriptive statistics such as mean, standard deviation, frequency, and percentages using SPSS. We used thematic analysis (Braun & Clarke, 2006) to examine the replies to the survey's open-ended questions.

3. RESULTS

The investigation's findings will appear in two sections. The first section will present quantitative data on how participants use AI writing tools, their writing habits, the extent of AI integration, overall experiences with AI writing tools, and challenges and concerns related to their use. The second section will cover how AI writing tools have affected students' writing skills and the features or improvements they want to see in AI writing tools to enhance their writing experiences.

3.1. Quantitative results

3.1.1. Usage Patterns of AI Writing Tools

The overwhelming majority of participants (81%) expressed familiarity with AI writing tools, emphasizing the ubiquity of these tools in contemporary writing practices. As illustrated in Table 1, the data revealed that a substantial percentage of participants reported using AI writing tools regularly, with 34.2% utilizing them daily and 41.6% using them weekly. The prevalence of daily usage indicates a significant integration of AI writing tools into participants' writing routines. This high level of engagement underscores the widespread adoption of AI technologies in facilitating writing processes.

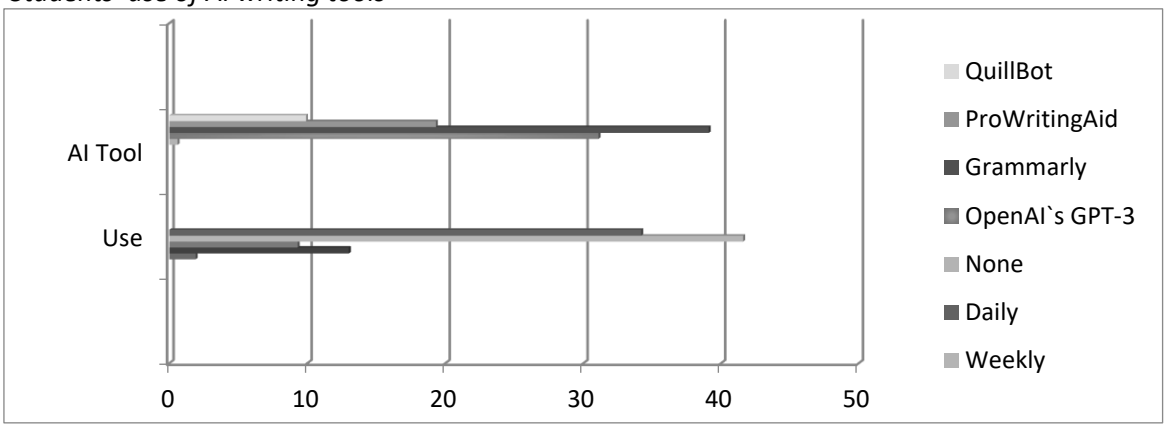
Table 1

Frequency count, mean, and standard deviation of students' usage of AI writing tools

Question	Never	rarely	Monthly	weekly	daily	Mean
How often do you use artificial intelligence tools for writing?	3	21	15	67	55	3.93
Question	**None**	**OpenAI's GPT-3**	**Grammarly**	**ProWritingAid**	**QuillBot**	**Mean**
What specific AI writing tools do you use, if any?	1	50	63	31	16	4.17

Figure 1

Students' use of AI writing tools



As seen in Figure 1, tools such as Grammarly, OpenAI's ChatGPT, and ProWritingAid were among the preferred choices. Among the AI writing tools mentioned, Grammarly was the most commonly used (39.1%), followed by OpenAI's ChatGPT (31.1%) and ProWritingAid (19.3%). This suggests a preference for AI tools known for their grammar correction and style suggestions.

3.1.2. Participants' overall experience of using AI writing tools

As reported in Table 2, the findings show that the majority of students (70.8%) perceived AI tools to have a positive influence on their writing abilities. They reported experiencing improvements in various aspects, including grammar, coherence, and productivity. This suggests that many individuals view AI as a valuable resource for refining and streamlining their writing processes. Conversely, a smaller percentage of participants (11.2%) reported experiencing a negative experience while using AI tools to complete their writing assignments. The rest of the participants (18%) indicated that they were neutral about their experience using AI tools on their writing skills. In other words, these students were undecided on whether using AI tools had any impact on their skills. Their responses underscore the variability in individuals' experiences with AI and suggest that not all users may perceive significant changes in their writing practices due to AI integration.

Table 2

Summary of students' evaluation of their overall experience of using AI tools

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Interpretation	SD
My experience with using AI writing tools has been positive so far.	1	6	26	60	68	3.96	Strongly agree	1.06

3.1.3. Challenges and concerns about using AI writing tools

The majority of participants (87%) reported that they had never encountered any technical challenges or noticed particular drawbacks when using AI writing tools. This indicates that a large percentage of the surveyed individuals found AI writing tools to be effective and user-friendly, without significant barriers hindering their use. However, a smaller percentage (13%) admitted to encountering challenges or drawbacks. When asked about the potential concerns about heavy reliance on AI tools, about half of the participants (46%) indicated that they did not believe heavy reliance on AI tools would hinder the development of their writing skills. This perspective suggests that some Saudi students share the view that AI is a valuable resource that can aid in tasks like grammar correction, content organization, or language refinement without necessarily replacing essential writing skills. A smaller percentage of participants (26.1%) expressed concern that heavy reliance on AI tools could indeed impede the development of writing skills. This group worried that excessive dependence on AI for writing tasks could lead to a decline in critical thinking, creativity, or mastery of language conventions. About a third of participants (28%) expressed uncertainty about the potential impact of heavy AI tool reliance on traditional writing skills. This uncertainty may stem from a lack of clarity about how AI tools interact with writing processes, concerns about the evolving nature of technology's role in education, or a need for more evidence-based research on the topic.

While the survey results highlighted a strong ethical stance against plagiarism, with the majority of participants (87%) reporting never engaging in such practices, over half of the students were undecided about whether using AI tools is ethical when generating a whole essay or even parts of it. In other words, they were not sure about the ethical use of AI tools, while only 31% thought using such tools was unethical. Students' opinions about the challenges and concerns of using AI tools are reported in Table 3.

Table 3

Summary of students 'opinions about challenges and concerns

Question	NO	Yes	May be
Have you encountered any challenges when using AI writing tools?	140	21	-
Are you concerned that heavy reliance on AI tools may hinder the development of writing skills?	74	42	45
Do you think that using AI to write parts or whole essays is ethical?	17	50	94

3.2. Quantitative results

The survey comprised two open-ended questions. The first one asked the respondents in what ways AI writing tools have affected their writing skills, and the second looked for additional features or improvements that they would like to see in AI writing tools to enhance their writing experiences.

3.2.1. Impact of AI writing tools as perceived by students

The qualitative data demonstrated how employing AI tools had a good effect on students' writing, which was consistent with the quantitative results. Qualitative data regarding how AI writing tools have affected their writing skills offer valuable insights into the perceived benefits of integrating these tools into the writing process. Firstly, many participants highlighted the improvement in grammar facilitated by AI tools. For instance, one of the respondents reported that AI writing tools have helped him identify and correct grammatical errors in his writing. This suggests that the automated grammar-checking feature of these tools has been effective in identifying and rectifying grammatical errors, thereby enhancing the overall quality of written content. Secondly, the mention of enhanced clarity indicates that AI writing tools have contributed to making participants' writing more coherent and concise. One of the respondents asserted, "AI tools made my writing clearer and more concise by suggesting improvements in sentence structure and coherence."

By suggesting improvements in sentence structure and coherence, these tools have likely helped writers communicate their ideas more effectively, ensuring that their message is clear and easily comprehensible to readers. Additionally, some respondents indicated that AI writing tools have saved them time by automating certain writing tasks or streamlining the editing process. The reported increase in productivity suggests that AI writing tools have enabled them to complete tasks more efficiently. One of the participants noted, "AI tools have exposed me to new words or phrases, enriching my writing vocabulary." This suggests that AI tools not only assist with error correction but also contribute to the overall improvement of writing skills by facilitating language learning and vocabulary expansion. Furthermore, another respondent mentioned, "AI tools have helped him organize his thoughts and ideas more effectively, leading to more structured and coherent writing."

4. DISCUSSION

The first research question examined the extent of students' use of AI writing tools. Results show that the majority of participants used AI writing tools, namely OpenAI's ChatGPT and ProWritingAid, respectively, regularly. Students seem to be aware of these new technologies, even though GenAI is still relatively young (Chan & Hu, 2023). Indeed, a sizable portion of participants were aware of the advantages of AI writing tools, and most of them agreed that these tools improve grammar by giving students immediate feedback on syntactical and grammatical errors, enabling them to produce content that is more polished and error-free. Marzuki et al., (2023) and Liu et al., (2023), who claimed that AI improves students' proficiency in English writing, support this conclusion.

The second research question addressed students' overall experience of using AI writing tools. Both quantitative and qualitative data reveal that the majority of students perceived AI tools to have a positive influence on their writing abilities. Participants reported improvements in various aspects of their writing, including grammar, coherence, and productivity. These findings corroborate the findings reported by researchers from different educational settings, namely South Korea (Lee et al., 2024), Hong Kong (Chan & Hu, 2023), and Vietnam (Le Phan, 2023).

Qualitative data shed light on how AI writing tools affected students' writing skills. Participants reported that AI tools helped them identify and correct grammatical errors, thus improving the quality of their writing. Other students thought that AI tools made their writing more coherent and concise. Additionally, some respondents indicated that AI writing tools saved them time by automating certain writing tasks or streamlining the editing process. The reported increase in productivity suggests that AI writing tools enabled them to complete tasks more efficiently. Students appreciated how AI algorithms analyze writing patterns, offer style suggestions, and accelerate the writing process (Marzuki et al., 2023).

The third research question outlines the challenges and concerns of using AI writing tools as perceived by students. About one-third of students had concerns about their heavy reliance on AI tools, which could impede the development of their writing skills. Specifically, students worried that excessive dependence on AI for writing tasks could lead to a decline in critical thinking, creativity, or mastery of language conventions (Talayhan, 2023). Participants in the studies conducted by Chan and Hu (2023) and Lee et al., (2024) expressed similar concerns. Students were also concerned about the possible loss of creativity and innovation. They stress how crucial it is to preserve human judgment and inventiveness when writing. This is consistent with Angulo et al., (2023), who pointed out that in the field of joint cognitive systems, a methodical approach is necessary because the human cognitive component needs to be defined alongside intelligent devices. While students appreciated the efficiency of AI tools in generating content, they complained that some of these tools cannot generate customized output that matches their needs in terms of level of readability. In other words, some of the generated content was too difficult to understand, so students could not use it to complete their writing assignments.

Another concern was the issue of plagiarism. Consistent with findings reported in other studies, the majority of Saudi students took a strong stand against plagiarism. However, when it comes to the ethical aspects of using AI tools, there was no consensus among students whether the usage of such tools to generate parts or a whole essay was ethical, echoing the perceptions of Croatian students reported by Črček and Patekar (2023), who delegated the decision of the ethics of using the tool to their instructors. Even students who believed that it was a questionable practice were engaged in using AI tools. One possible explanation is that the use of AI writing tools is a recent phenomenon. Saudi universities have not yet set clear guidelines about the responsible use of AI tools. Therefore, some instructors may not have briefed students about the ethical uses of such tools (du Boulay, 2023). Instructors who are not techy may not be even aware of the capabilities of AI tools, let alone discuss their ethical use.

5. CONCLUSIONS

This study aimed to investigate the use and perceptions of Saudi university students from different majors towards AI-powered writing tools. The findings reveal a wide use of popular AI writing tools, such as OpenAI's ChatGPT and ProWritingAid. Overall, students reported having a positive experience using AI tools and thought that they had concrete positive effects on their writing skills. They felt such tools helped them produce better writing thanks to the multiple features that make writing assistants very useful.

However, participants shared concerns about overreliance on AI for writing tasks, which may affect their creativity as well as the aspects of using AI tools.

The findings of this study, which uncovered that students' perceptions of AI writing tools encompass both positive and negative sentiments, offer implications. To address students' concerns regarding the overuse of AI tools, students must receive adequate training on using these tools effectively to maximize their learning. In addition, teachers should consider designing activities that engage students in critical analysis of AI-generated content. The ability to discern between trustworthy and untrustworthy sources is key to the development of critical thinking skills. The ethical issues raised by students provide compelling evidence for the need for educators and stakeholders to devise ethical guidelines that can mitigate the irresponsible use of AI-powered tools. AI tools are part of today's reality. It is only through the collaboration of AI experts and researchers that we can leverage AI tools in ways to support student learning.

This study has limitations, however, notably the reliance on a sample of students from one educational environment. Therefore, we should interpret the findings with caution. Future research should gauge students' perceptions from geographic locations and educational backgrounds to capture a more comprehensive perspective. Second, the researchers relied only on quantitative data and open-ended questions. To gain deeper insights into the role and impact of AI in academic writing, we should conduct focus group discussions. Finally, the study did not account for variables that might have influenced students' usage and perceptions of AI writing tools. Future studies may be undertaken to examine the potential effect of gender, GPA, and technology-self efficacy in adopting and using AI tools and students' overall experience of integrating such tools into their learning.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: The study provided students who agreed to participate with an informed consent form before they completed the survey. We ensured that participation was entirely voluntary and that respondents' identities remained anonymous.

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