

EFL UNDERGRADUATE STUDENTS' GENDER DIFFERENCES IN THE UTILIZATION OF AI-ASSISTED WRITING APPLICATIONS

**Aulia Putri Yulistia^{1*}, Ahmad Munir², Him'mawan Adi Nugroho³, Syafi'ul Anam⁴,
Slamet Setiawan⁵**

¹aulia.23014@mhs.unesa.ac.id, ²ahmadmunir@unesa.ac.id, ³himmawannugroho@unesa.ac.id,
⁴syafiul.anam@unesa.ac.id, ⁵slametsetiawan@unesa.ac.id

UNIVERSITAS NEGERI SURABAYA

Received: December 26, 2024; Accepted: August 12, 2025

ABSTRACT

Artificial Intelligence (AI) has become a significant development in academic writing practices as it can aid undergraduate students in improving their writing skills. This study examines the gender differences in the usage and effectiveness of AI-assisted writing applications and students' perceptions regarding the benefits and challenges of using these AI tools in academic writing. A mixed-methods approach was employed, combining quantitative data from questionnaires with qualitative insights derived from interviews with 54 students (27 female and 27 male). The findings reveal no significant gender differences when using AI-enhanced writing applications. Both male and female students reported similar satisfaction with the tools, including ease of use, accessibility, and effectiveness in improving their writing. However, nuanced variations in confidence levels and usage patterns emerged. Furthermore, students expressed benefits, highlighting their utility in improving grammar, vocabulary, and overall writing proficiency. Concerns about over-reliance and potential impact on creativity and critical thinking were also noted. The findings also suggest a need for tailored pedagogical strategies incorporating AI while promoting independent thought and creativity.

Keywords: AI-Assisted Writing Applications, Gender Differences, Student Perceptions

A. INTRODUCTION

The rapid advancement of technology has profoundly influenced Education, converting traditional learning methods into more engaging and accessible experiences. Among these advancements, Artificial Intelligence (AI) has emerged as a formidable tool, particularly in language acquisition, where it facilitates the enhancement of writing proficiency (Toboula, 2023). AI, a computer-based human intelligence simulation, is designed to enhance education by driving the 4.0 industrial revolution and facilitating teaching and learning. It

involves the development of intelligent systems, such as computer programs and robots, that mimic human cognitive functions, enabling tasks like prediction, problem-solving, and natural language processing (Fitria, 2021; Karsenti, 2019.; Sak, 2024). AI applications, including technologies such as Automated Writing Evaluation (AWE), Automated Essay Scoring (AES), and AI-assisted Writing Correction Features (AWCF), support grammar, coherence, and structure improvement in students' written works. Popular applications, moreover, such as Grammarly, QuillBot, ChatGPT, and so forth, have become indispensable for EFL learners (Kurniati & Fithriani, 2022), assisting with academic writing tasks while fostering interactive learning experiences. By integrating AI into ELT, educators can enhance students' engagement, promote effective learning, and contribute to the professional development of language educators (Ali, 2020).

Writing skills are essential for academic success in higher education, yet they remain challenging to master due to their complexity. Academic writing requires proficiency in grammar, vocabulary, content organization, and coherence, all of which demand significant effort and practice (Fauziah & Minarti, 2023). For undergraduate students, especially those studying English, mastering writing is a crucial yet intricate process as it involves not only language accuracy but also the ability to convey ideas effectively and persuasively. These difficulties highlight the importance of providing targeted support and resources to help students develop their writing abilities in an academic writing course (Charrouf, 2015). As a result, learners utilize AI to help them gain advanced writing skills. As educators, teachers also need to use technology in their teaching-learning activities to engage learners more during the learning process. Furthermore, to improve teaching efficacy, English teachers incorporate technology into EFL courses (Huang et al., 2020). Technology may support educators and students in successful classroom environments where teachers can create task-oriented activities and students can engage in new learning experiences distinct from those previously utilized (Huang et al., 2020).

Nowadays, learners can use many digital writing tools, and it affects students' writing skills. Ali et al. argued that one AI application, ChatGPT, stimulated and motivated learners to improve their writing skills (Ali, 2020). Moreover, Fauziah and Minarti (2023) claimed that applications like ChatGPT, Publish or Perish, Essaybot, Essay Writer, Jenni AI, Chat PDF, and Grammarly assisted students' academic writing task and each application has their function regarding helping them write essays or scientific articles efficiently and effectively. These AI-assisted writing applications could help enhance students' writing quality, vocabulary, grammar, and punctuation. In addition, Al Mahmud (2023) insisted that using Wordtune increased students' writing quality, making modest lexical and syntactic writing. Further, AI-driven educational tools facilitated the attainment of their learning objectives since students employed AI-based learning tools to enhance their vocabulary and grammar skills in the context of writing (Phan, 2023). However, students became lazy, and their logical reasoning and creativity decreased when utilizing AI (Fauziah & Minarti, 2023).

Utilizing AI-assisted writing applications in writing raises several perceptions from students. According to Robin, quoted by Lindawati et al., (2022) that perception involves individuals acquiring information through sensory organs, followed by analysis, synthesis, and evaluation to derive meaning. Robbin's viewpoint commonly aligns with past opinions, incorporating aspects of assessing or appraising perceived objects. Moreover, there are two types of perceptions: positive and negative. Positive perception arises from individuals' satisfaction with objects, driven by their knowledge and experiences with those objects,

while negative perception results from individual dissatisfaction with objects, limited understanding, and lack of personal experience. AI-assisted writing applications in language education significantly enhance students' writing skills, engagement, and mistake correction.

There are several students' perceptions regarding utilizing AI-assisted writing applications (Burkhard, 2022; Chang et al., 2021; Fitria, 2021; Herwanto et al., 2024; Hwang et al., 2023; Lee et al., 2024; Phan, 2023; Rahman et al., 2022). Burkhard stated that students exhibit varying perspectives on AI-driven writing tools, and tailoring instructional approaches could be beneficial in encouraging or advising caution regarding adopting such tools (Burkhard, 2022). Further, Phan claimed that students generally hold positive attitudes, appreciating the accessibility and adaptability of AI writing tools. They recognize improvements in writing abilities, particularly in vocabulary and grammar. Most agree that AI-based learning tools help them reach their learning goals and enhance engagement in learning English writing (Phan, 2023). Furthermore, Rahman et al., (2022) demonstrated the function of an AI-assisted language learning tool in detecting and rectifying grammatical faults, hence enhancing writing proficiency among EFL learners, a notable improvement in the writing capabilities of EFL learners, who also conveyed favorable impressions of the impact of AI-assisted language learning on their writing proficiency.

A study by Hwang et al. insisted that by using the AI-assisted tool, the experimental group surpassed the control group in writing tasks. The AI tool's customization function significantly aided learners in revising and amending their writing tasks (Hwang et al., 2023). Moreover, an AI-powered language learning tool significantly improved learners' writing skills, with the experimental group outperforming the control group. The tool provided corrective feedback, allowing learners to revise and improve their written texts, highlighting its significant role in enhancing EFL learners' writing performance (Chang et al., 2021; Fitria, 2021). Lee et al.'s findings asserted that AI-based writing tools may enhance the writing skills of English language learners (ELLs), mainly via the accessibility of machine translation and the error-checking functionalities of generative AI (Lee et al., 2024). Another study on English major students' attitudes towards ChatGPT for academic writing indicated that it was beneficial because of its user-friendliness, efficiency in saving time, and capacity to generate ideas and suggestions. Most participants deemed ChatGPT user-friendly, citing features such as suggestions and formatting choices (Herwanto et al., 2024). In summary, although students typically hold favorable views of AI-assisted writing tools, valuing their adaptability, feedback systems, and capacity to improve writing skills, educators must consider these perspectives when incorporating such technologies into English language learning programs to optimize their efficacy.

On the other hand, despite these positive perceptions, several challenges are faced by the students (Herwanto et al., 2024; Nguyen & Dieu, 2024; Phan, 2023; Putra, 2023; Utami et al., 2023). Challenges like technology anxiety and a desire for more tool variety are noted (Phan, 2023). Putra's study insisted that teachers and students appreciate AI writing tools for identifying errors and saving time. Opinions on whether these tools amount to cheating differ. Teachers are divided into incorporating them into teaching, while students favor integration. The study emphasizes the effectiveness of tools like Grammarly and QuillBot but raises concerns about grammar accuracy and tone suggestions (Putra, 2023).

A study from Nguyen and Dieu (2024) highlighted the challenges of using AI, specifically ChatGPT, including dependence, plagiarism, deterioration of critical thinking skills,

insufficient feedback on idea development and cohesion, and potential misinformation. Students fear becoming overly dependent on ChatGPT, which could lead to plagiarism and a lack of motivation to explore other resources. Additionally, the generated content may lack practicality or contain inaccurate information, potentially misleading students (Nguyen & Dieu, 2024). A study from Herwanto et al. (2024) also indicated that by utilizing ChatGPT, students had ambivalent sentiments, with some expressing confidence in its recommendations while others voiced apprehensions over possible plagiarism.

In another study, Utami et al. asserted that AI-driven learning tools aid students in the planning and drafting phases of writing, providing flexibility and accessibility. Despite being appreciated, these tools are observed to have limitations in editing Indonesian text. Notably, the utilization of AI has not substantially influenced the quality of students' academic papers across diverse indicators (Utami et al., 2023). Given these challenges, although AI-assisted writing applications provide significant advantages in efficiency and error detection, apprehensions regarding over-reliance, accuracy, and potential ethical dilemmas such as plagiarism highlight the necessity for a balanced and conscientious approach to their incorporation into academic writing practices.

In academic settings, AI-assisted writing applications such as Grammarly, QuillBot, and ChatGPT have become essential for undergraduate students, providing immediate feedback and assistance for writing tasks. Students, as digital natives, increasingly depend on these devices to enhance their writing efficiency and alleviate anxiety. Despite several advantages, apprehensions persist about excessive dependence on these technologies, especially concerning their possible effects on critical thinking and creativity (Fauziah & Minarti, 2023). Moreover, while many studies have concentrated on the broad use of AI in Education, there has been little investigation into gender disparities in the engagement of male and female students with these technologies. This research aims to address this gap by examining whether male and female undergraduate students vary in their use of AI-assisted writing tools and the impact of these tools on their writing proficiency.

This research examines the use of AI-powered writing applications among male and female EFL undergraduate students. More precisely, the study aims to investigate any notable disparities in the use and perceptions of language depending on gender and to comprehend how these language applications impact students' English writing abilities in learning. Therefore, the following research questions are:

1. Are there gender-based differences in the utilization and effectiveness of AI-assisted writing applications among EFL learners?
2. What are EFL students' perceptions regarding the benefits and challenges of using AI-assisted writing tools in academic writing?

B. METHOD

This study used a mixed methods approach to gain the data comprehensively. Mixed methods research involves collecting both quantitative and qualitative data, integrating them, and drawing conclusions from the combined database, incorporating philosophical assumptions and theories (Creswell & Creswell, 2023). First, to examine gender-based differences in the utilization and effectiveness of AI-assisted writing applications, a quantitative correlational survey was conducted. A correlational study was appropriate for identifying statistically significant relationships since it is a quantitative research method that measures the association between two or more variables using correlational analysis,

focusing on a single group of individuals rather than multiple groups (Creswell & Creswell, 2023). Furthermore, a qualitative study was employed to explore students' perceptions of the benefits and challenges of AI tools in language learning, particularly in academic writing. The qualitative design was used since it emphasizes the interconnections of individuals and their world, focusing on social reality and meanings of events, providing rich narrative reports (Ary et al., 2010) and providing deeper insights into students' experiences and attitudes, capturing nuances perspectives that could not be fully revealed through quantitative data. Hence, these methods ensured a robust and holistic understanding of both the gender dynamics and the perceived impact of AI-assisted writing applications.

In addition, the participants of this study were EFL undergraduate students who had prior experience utilizing AI-assisted writing applications in their academic writing tasks. A total of 54 students participated in this study, with 27 participants from each gender. These students came from diverse academic cohorts, representing different levels of study and various universities across Surabaya, East Java, Indonesia. The selection of participants from multiple universities and academic backgrounds was intended to provide a more comprehensive view of how AI-assisted writing applications were perceived and utilized across different educational settings. This diversity in the sample allowed for a broader analysis of the impact of AI applications on writing skills, ensuring that the findings would be more comprehensive of the wider student population within the region. Moreover, the balanced gender representation facilitated the exploration of any potential differences in how male and female students experienced and perceived the use of AI in their writing process (Phan, 2023).

Two instruments were used to collect the data. The study used an online questionnaire to answer the first research question and a semi-structured interview to answer the second research question. A questionnaire is a survey form where participants complete and return information, while an interview involves the researcher recording responses from the participants (Creswell & Creswell, 2023). The questionnaire adapted from (Kurniati & Fithriani, 2022; Hakiki, 2021) focused on utilizing AI Apps and the students' perceptions of utilizing them in their writing skills. Firstly, the questionnaire used open-ended and close-ended questions with 5 Likert-scale types: strongly agree, agree, neutral, disagree, and strongly disagree. There were three sections in the online questionnaire: five questions regarding students' demographic information, four questions regarding students' experiences with AI Applications in writing skills, and fifteen questions regarding the usefulness of AI Applications in enhancing students' writing skills. This comprehensive questionnaire helped gather quantitative data on students' utilization and perceptions of its efficacy. Furthermore, semi-structured interviews were conducted to gain more profound insights regarding students' perceptions of utilizing AI applications in their writing classes. Five students who indicated their willingness to participate in the interviews by signing a consent form were selected. These students were asked seven semi-structured questions that delved deeper into their experiences, perceptions, and opinions regarding AI-assisted writing applications' roles in improving their writing skills. The semi-structured interviews allowed flexibility in probing specific topics while ensuring consistency across all participants.

The collected data from questionnaires and interviews were organized, analyzed, and interpreted. First, the quantitative data, such as online questionnaires, were analyzed using SPSS software to determine statistical relationships between the utilization of AI-assisted writing applications and students' improvement in their writing skills. Further, the researcher

transcribed, organized, coded, and analyzed semi-structured interviews for qualitative data to get deeper insights. Lastly, after studying both data, the researcher further explained and interpreted the use of AI-assisted writing applications in students' writing skills in English language learning. This integrated analysis highlighted both the measurable impact of AI-assisted writing applications on students' writing performance and their nuanced perceptions (Rahman et al., 2022).

C. FINDINGS AND DISCUSSION

1. Gender Differences in Utilizing AI-Assisted Writing Applications in ELT

The research examines potential gender differences in the utilization of AI-assisted writing applications among undergraduate EFL students in ELT. A complete knowledge of the experiences of 54 undergraduate students (27 females and 27 men) from several universities in Surabaya, East Java, was obtained by collecting data from a varied population. Table 1 presents the descriptive statistics results of the questionnaire. See Table 1.

Table 1. Descriptive Statistics

No.	Items	Female		Male	
		Mean	SD	Mean	SD
1.	AI Apps that I use are really easy to use for my writing essay	4.41	.694	4.48	.643
2.	AI Apps that I use are an accessible digital tool	4.48	.643	4.44	.698
3.	AI Apps that I use are effective since they include several features that can help me improve the quality of my writing	4.41	.636	4.33	.620
4.	AI Apps that I use give good explanations for my errors in writing my essay	4.04	.854	4.26	.656
5.	AI Apps that I use have great features that assist me in writing	4.33	.679	4.26	.594
6.	AI Apps that I use are very helpful in developing my writing skills	4.22	.698	4.22	.934
7.	With AI, I have more confidence in my writing skills	3.93	.997	4.07	.829
8.	I think AI has helped me understand English grammar rules more	3.81	.962	3.85	1.064
9.	AI Apps that I use encourage me to write and reduce my writing anxiety	3.96	.808	3.78	1.050
10.	Using AI Applications boosts my confidence in my writing	3.78	1.013	4.07	.829
11.	By utilizing AI, my writing skills in organizing text have improved	4.00	.920	4.15	.718
12.	Unconsciously, my vocabulary, particularly the terms used in my writing class, has increased	4.19	.834	4.22	.698
13.	Using AI Apps in my writing class has improved my grammar skills	4.04	.940	4.33	.620
14.	I prefer to use AI Apps in my writing class	3.78	.934	4.04	.898
15.	I can write efficiently and get better results when I use AI apps.	4.15	.818	4.15	.818

As shown in Table 1, the data revealed no statistically significant differences between male and female students in their overall engagement with these technologies. The mean scores for ease of use, accessibility, and perceived effectiveness are strikingly similar across genders. For instance, both male ($M=4.48$, $SD=.643$) and female ($M=4.41$, $SD=.694$) students reported that AI tools were easy to use for writing essays. Similarly, male and female students rated AI applications highly for their ability to enhance writing quality (males: $M=4.33$, $SD=.620$; females: $M=4.41$, $SD=.636$). These findings align with the results of previous studies, such as Fauziah and Minarti (2023)'s study which emphasized the consistent utility of tools like Grammarly and ChatGPT in improving grammatical precision and overall writing quality regardless of demographic factors.

Moreover, the data highlights that both genders experienced comparable benefits in terms of reduced writing anxiety. AI tools were noted to boost confidence levels in writing (males: $M=4.07$, $SD=.829$; females: $M=3.78$; $SD=1.103$). These results support the Phan's (2023) findings, which argue that AI-assisted writing tools significantly alleviate students' apprehension about writing through immediate feedback and guidance. Despite the absence of statistically significant differences in the table, male students reported slightly higher levels of self-assurance, potentially reflecting societal or cultural norms that may influence technological confidence. However, female students demonstrated a more cautious approach, often prioritizing the accuracy and relevance of AI-generated content. This echoes Putra (2023) who noted similar cautious attitudes among certain student groups when engaging with AI technologies.

Interestingly, AI applications were universally praised for their ability to address technical aspects of writing, such as grammar, vocabulary, and text organization. The data showed that both male and female students observed improvements in their ability to organize content and reduce mechanical errors, with an average mean score of 4.15 ($SD=.818$) for both genders. This underscores the tools' role as cognitive scaffolds, enabling students to focus more on higher-order writing tasks such as argument construction. Additionally, unintentional vocabulary enhancement was reported (females: $M=4.22$, $SD=.698$; males: $M=4.22$; $SD=.698$). Such findings align with Utami et al., (2023), who documented similar trends in vocabulary expansion and grammatical accuracy among students using AI-powered writing tools.

Nevertheless, despite the advantages, a shared concern among both male and female students was the potential for over-reliance on AI tools. Several participants expressed fears that such dependence might hinder the development of critical thinking and creativity, an apprehension supported by prior research (Nguyen & Dieu, 2024; Putra, 2023). For instance, while AI tools effectively automate certain aspects of writing, they do not inherently foster the development of deeper analytical skills, as evidenced by the students' mean scores for writing confidence, which were still moderate (males: $M=4.07$; females: 3.93).

In conclusion, the findings suggest that AI-assisted writing applications provide equitable benefits to male and female students alike, with no statistically significant gender-based disparities in their usage or perceptions. However, nuances and differences in confidence levels and approaches to using these tools highlight the need for tailored support from educators. Integrating AI tools into academic curricula while emphasizing independent critical thinking can help maximize their benefits while addressing potential pitfalls. This

aligns with (Burkhard, 2022), who recommended designing gender-sensitive training programs to ensure inclusive and effective use of educational technologies.

2. Students' Perceptions: Benefits and Challenges

The research obtained valuable insights into the viewpoints of undergraduate students on AI-assisted writing applications. The results demonstrated a range of student viewpoints on the advantages and challenges of using AI-assisted writing applications in their academic writing assignments.

Overall, students expressed overwhelmingly positive attitudes towards these tools. They agreed favorably to using AI-assisted writing applications, including QuillBot, ChatGPT, Perplexity, Scispace, Grammarly, Google Docs, Google Translate, and DeepL. Students highlighted the simplicity, accessibility, and general efficacy of these applications in improving various aspects of their writing. Seven students mentioned that AI-assisted writing applications were particularly beneficial in generating ideas and structuring their thoughts when they faced challenges starting a writing work. The statements *"These AI-assisted writing applications were beneficial to me when I lacked knowledge on how to write"* and *"AI provided me with valuable understanding on the topic"* demonstrated how these applications aided students in pre-writing by supporting them in generating outlines and brainstorming ideas.

Moreover, ten students valued AI applications' distinct capabilities in enhancing their writing's coherence, syntax, and general excellence. According to a student's observation, *"The use of AI in my writing is beneficial because it assists me in rephrasing my content using academic language that is easy to comprehend."* Others agreed with this position, affirming that these tools are advantageous for *"improving, rectifying, assessing, and appraising writing assignments"* and even for locating pertinent sources to bolster their views. This response suggested that AI-assisted writing applications were seen as flexible tools that aided students in enhancing both the technical parts of their writing and the academic rigor of their work.

However, alongside these positive perceptions, students also expressed significant challenges using AI-assisted writing applications. A significant issue of utmost importance was the dependability of the material created by AI. Students were wary of the precision and suitability of the recommendations offered by these tools. One student astutely noted, *"Naturally, we must verify the information as it is not dependable. After the first editing process, we must thoroughly verify or make revisions."* This discovery indicated that while students appreciated the usefulness of AI technologies, they were cautious in confirming and improving the information to maintain its academic credibility.

Moreover, economic obstacles were seen as substantial obstacles. A significant number of students have reported that the free versions of AI applications have restricted capabilities, and the expenses associated with upgrading to premium versions were considered prohibitive by some students. One student expressed the desire to upgrade to premium or pro capabilities, which come at a higher cost, raising concerns about equal access to these tools. Additionally, it was observed that technological constraints, such as the need for a reliable internet connection, posed extra challenges to the regular use of AI applications, particularly in underprivileged environments.

The findings also revealed mixed perspectives among students over their dependence on AI technologies. Three of the five students clearly stated their preference for using AI technologies, highlighting advantages such as being advantageous, uncomplicated, productive, efficient, and cost-free. However, the other two students adopted a more cautious stance. They preferred not relying only on AI technologies but acknowledging their usefulness. A student said that their reliance on AI is equally divided since there are instances when they choose not to depend on it and instead do tasks independently. *“Nevertheless, I will use it in situations when it is most necessary.”* This statement reflected an awareness of the benefits and the limitations of AI technologies, underscoring the importance of using them as a complement rather than a replacement for traditional writing skills.

The findings are aligned with previous research (Herwanto et al., 2024; Nguyen & Dieu, 2024). Herwanto et al. (2024) emphasized that while students appreciated the accessibility and effectiveness of tools such as ChatGPT, apprehensions persist about possible over-dependence, particularly with plagiarism and reduced originality. Similarly, Nguyen and Dieu (2024) found that while AI tools aided in grammatical correction and vocabulary enhancement, students were concerned that their critical thinking abilities might decline owing to overreliance. Phan supported this, revealing that although students mainly exhibited favorable opinions towards AI applications, especially in enhancing writing abilities, they also had apprehension over the tools’ limits, specifically their incapacity to resolve intricate writing challenges (Phan, 2023) adequately. These comparative findings revealed a consistent theme that students recognized the efficiency and quality improvements offered by AI tools but remained concerned about their impact on deeper cognitive functions, such as critical thinking and creativity.

Educators must, therefore, adopt a balanced approach when integrating AI tools into ELT. Although AI technologies may improve writing abilities, they should not replace fundamental educational processes such as ideation, drafting, and peer evaluation. These technologies should complement conventional approaches, offering help without compromising students’ critical and creative thinking capacity. Peer-learning possibilities, in which students exchange techniques for the appropriate use of AI technology, may cultivate autonomous writing abilities while reducing excessive dependence. Educational institutions could contemplate providing sophisticated iterations of AI apps or institutional licensing to guarantee that all students can access the whole array of capabilities. Overcoming economic and technical barriers is essential for establishing an inclusive educational environment that enables all students to benefit from technological advances. This study illuminates student experiences with AI-assisted writing. However, further research is required to investigate these tools’ long-term effects, especially for enhancing critical thinking and creativity.

D. CONCLUSION

This research examined the gender dynamics in using AI-assisted writing programs among university students participating in an English as a Second Language program. The results demonstrated that AI-assisted writing applications such as Grammarly, QuillBot, ChatGPT, and so forth are advantageous for both male and female students, exhibiting no substantial disparities in overall use trends. Both groups deemed these applications beneficial in enhancing writing quality, alleviating anxiety, and fostering confidence via prompt feedback on grammar and style. Male students exhibited somewhat more confidence in their writing

capabilities when using AI, but female students used similar tools with increased caution, reflecting broader social patterns in digital tool engagement.

This study presents a unique addition by demonstrating the lack of substantial gender differences in using AI technologies among EFL students. This study reveals that both genders display comparable levels of pleasure and enhancement in writing skills, in contrast to previous research that concentrated on the overall efficacy of AI tools. This discovery challenges the presumption that gender affects technology adoption, indicating that personal learning styles or technical competence may be more significant factors. This research elucidates students' worries about AI, including over-reliance and its possible effects on critical thinking.

Although AI-assisted writing applications markedly improve grammar, vocabulary, and composition, educators should exercise caution over their use in academic writing. The potential for students to develop excessive reliance on AI technology, which might hinder their involvement in intricate cognitive activities such as argument construction and creativity enhancement, is a worry that requires attention. Furthermore, concerns around financial accessibility, particularly the expense associated with sophisticated functionalities in AI tools, underscore the need for equal access to educational technology, especially for students from underprivileged backgrounds.

While AI-assisted writing applications provide considerable advantages regarding accessibility, speed, and feedback, their incorporation must be meticulously overseen to guarantee that they enhance rather than supplant conventional writing abilities. By advocating for a balanced methodology that integrates the technical advantages of AI with an emphasis on creativity and critical thinking, educators may enable students to maximize new technologies without sacrificing fundamental cognitive abilities. Future studies need to concentrate on longitudinal studies to evaluate the enduring impacts of AI on writing skills, especially in enhancing creativity and critical thinking. Furthermore, strategies to alleviate the possible over-dependence on technology in educational settings must be developed, guaranteeing that students can use AI proficiently without compromising their intellectual autonomy.

E. REFERENCES

- Ali, Z. (2020). Artificial Intelligence (AI): A Review of its Uses in Language Teaching and Learning. *IOP Conference Series: Materials Science and Engineering*, 769(1). <https://doi.org/10.1088/1757-899X/769/1/012043>
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to Research in Education*.
- Burkhard, M. (2022). Student Perceptions of AI-Powered Writing Tools: Towards Individualized Teaching Strategies. <https://www.grammarly.com/plagiarism-checker>
- Chang, T.-S., Li, Y., Huang, H.-W., & Whitfield, B. (2021). Exploring EFL students' writing performance and their acceptance of AI-based automated writing feedback. *Proceedings of the 2021 2nd International Conference on Education Development and Studies*, 31–35.
- Charrouf, A. (2015). Improving EFL Students' Writing Skill through a Directed Blog Case of Students at Mohamed Khider University of Biskra *A dissertation submitted in partial fulfilment for the requirements for The Master of Arts Degree in Language Sciences*.

- Creswell, J. W., & Creswell, J. D. (2023). Sixth Edition - Research Design.
- Fauziah, Z., & Minarti, S. (2023). Artificial Intelligence-Assisted Writing Application for Improving Writing Skills of Islamic Education Students. In *Agustus Tahun* (Vol. 13, Issue 2).
- Fitria, T. N. (2021). Grammarly as AI-powered English writing assistant: Students' alternative for writing English. *Metathesis: Journal of English Language, Literature, and Teaching*, 5(1), 65–78.
- Herwanto, W. H., Setiawan, S., & Munir, A. (2024). What Lies Beneath English Major Students' Attitudes towards ChatGPT for Academic Writing: A TAM Perspective? *Equilibrium: Jurnal Pendidikan*, 12(2), 152–159.
- Huang, H. W., Li, Z., & Taylor, L. (2020). The Effectiveness of Using Grammarly to Improve Students' Writing Skills. *ACM International Conference Proceeding Series*, 122–127. <https://doi.org/10.1145/3402569.3402594>
- Hwang, W.-Y., Nurtantyana, R., Purba, S. W. D., Hariyanti, U., Indrihapsari, Y., & Surjono, H. D. (2023). AI and recognition technologies to facilitate English as foreign language writing for supporting personalization and contextualization in authentic contexts. *Journal of Educational Computing Research*, 61(5), 1008–1035.
- Karsenti, T. (2019). The urgent need to prepare teachers for tomorrow's schools.
- Kurniati, E. Y., & Fithriani, R. (2022). Post-Graduate Students' Perceptions of Quillbot Utilization in English Academic Writing Class. *Journal of English Language Teaching and Linguistics*, 7(3), 437. <https://doi.org/10.21462/jeltl.v7i3.852>
- Le Phan, T. N. (2023). Students' perceptions of the AI technology application in English writing classes. *Proceedings of the AsiaCALL International Conference*, 4, 45–62.
- 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.
- Lindawati, N., Jabu, B., & Baa, S. (2022). Students' Perception on the Use of WhatsApp in Learning EFL during Covid 19 at Remote Area.
- Nguyen, P. H., & Dieu, N. B. (2024). An investigation into third-year Elt students' perceptions of using Chatgpt as an Ai writing-assistant tool: a case study in Vietnam. *International Journal of Arts Humanities and Social Sciences Studies*, 9(5).
- Phan, T. N. Le. (2023). Students' Perceptions of the AI Technology Application in English Writing Classes. *Proceedings of the AsiaCALL International Conference*, 4, 45–62. <https://doi.org/10.54855/paic.2344>
- Putra, M. (2023). AI Writing Correction Tools: Teachers and Students' Perception. *Jurnal Tatsqif*, 21(1), 35–66. <https://doi.org/10.20414/jtq.v21i1.7963>
- Rahma Hakiki, G. N. (2021). Perception of EFL Students on the Use Grammarly Application in Writing Class. *EDUVELOP*, 4(2), 99–106. <https://doi.org/10.31605/eduvelop.v4i2.891>
- Rahman, N. A. A., Zulkornain, L. H., & Hamzah, N. H. (2022). Exploring artificial intelligence using automated writing evaluation for writing skills. *Environment-Behaviour Proceedings Journal*, 7(SI9), 547–553.
- TOBOULA, C. M. Z. (2023). Exploring the Impact of AI-powered Collaborative and Interactive NLP Apps on EFL Teaching in the Post-COVID-19 Era. *International Journal on Cybernetics & Informatics*, 12(2), 171–193. <https://doi.org/10.5121/ijci.2023.120213>

Yulistia, Munir, Nugroho, Anam & Setiawan: EFL Undergraduate Students' Gender ...

- Utami, S. P. T., Andayani, Winarni, R., & Sumarwati. (2023). Utilization of artificial intelligence technology in an academic writing class: How do Indonesian students perceive? *Contemporary Educational Technology*, 15(4). <https://doi.org/10.30935/cedtech/13419>
- CAK, C. T. (2024). Utilizing Artificial Intelligence in English Language Education for Tourism Students. *Bulletin of the International University of Tourism And Hospitality*, II (4), 102–113.