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REVIEW ARTICLE

Implications of Leveraging AI in Students' Academic Writing: A Review Analysis

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ABSTRACT

Artificial intelligence has significantly reduced the need for human activity in education. Numerous AI technologies are already present in various academic applications created to help students with their academic writing. However, although the leverage of AI in academic writing for a student is associated with numerous opportunities, it also raises multiple issues and problems that should be thoroughly investigated. The objective of this study is to review the implications of leveraging AI in student academic writing. This study employed a review analysis approach, examining relevant literature based on the specified keywords. The methodology of this study includes: (a) a technique for searching the literature; (b) determining inclusion and exclusion criteria; and (c) a review analysis process. The review analysis identified several implications of leveraging AI for students' academic writing. They include, but are not limited to: (a) paradigm shift in learning; (b) ethical considerations and research integrity; (c) enhancing writing abilities and efficiency; (d) redefining academic writing practices; and (e) collaboration between AI and human writers. In conclusion, leveraging AI as a supplementary tool has revealed several positive implications for students' academic writing and has considered the significance and relevance of these findings. For additional studies, a broader discussion of the ethical concerns associated with the leverage of AI in academic writing will have to be developed.

Contribution/Originality: This study contributes to the existing literature regarding the implications of leveraging AI in students' academic writing. This study made a valuable contribution to the growing body of knowledge on the effectiveness of AI-assisted tools in enhancing writing quality, improving research efficiency, fostering critical thinking, and recognising academic ethics among students.

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1. Introduction

Artificial intelligence has significantly reduced the need for human activity in education. Numerous AI technologies are already present in various academic applications created to help students with their academic writing. As noted by Pardamean et al. (2022), students might benefit from such AI technologies in terms of the efficacy of the ideas' development, research and content organisation efficiency, and the paper's structure, style, and grammar. These writing assistants based on AI supply students with real-time feedback and suggest some improvements, which make the application of references easier. Since AI helps students create clear and expert-content writing, there is no need to spend that much time on such things as paper writing, for example. Nevertheless, educators should actively support students in learning how to use AI beneficially and responsibly so that these new technologies contribute to the expansion of learning rather than replace it (Song & Song, 2023). AI can become an important tool for writing instruction, which complements more traditional pedagogy methods. It opens up possibilities for students to improve their abilities in ways that would not be possible otherwise. Students can utilise some AI technologies in such academic writing aspects as idea, research and content organisation, as well as paper editing. Similarly, students will benefit from the knowledge they obtain from their personalised help.

However, although the leverage of AI in academic writing for a student is associated with numerous opportunities, it also raises multiple issues and problems that should be thoroughly investigated (Farrelly & Baker, 2023). The use of AI writing applications in an academic environment is a field of numerous discussions related to authorship and the development of efficient writing skills. Moreover, the use of AI in writing produces controversies among educators as concerns about excessive reliance on the program arise. Therefore, it is worth mentioning that, "the platform can also be seen as somewhat of a 'cheat' that prevents students from actually learning". Among other areas of concern is also the fact that the use of AI writing applications in the classroom hinders critical classes and the ability to express thoughts that students get in this class. Moreover, some multiple implications and issues require thorough research to be investigated as the use of AI in education raises continuous discussion regarding the benefits problems and ethical issues the use of AI in education may lead to (Cotton et al., 2024). In addition, it is stipulated that despite the fact that there is limited research on the issue, the integration of writing AI has not led to any negative long-term effects on the writing skills and cognitive development of the student.

This study has numerous benefits, including the proliferation of informed policies and the maximisation of best practices most fit for educational institutions, thus helping to integrate the use of AI in the academic writings of students soundly (Pinzolits, 2024). Such learning reviews as the one following allow educators to adjust their methods of teaching, subsequently optimising the preparedness of students for a future filled with AI. It favours a more viable approach to the adoption of AI that is simultaneously neatly entwined in human abilities, utilising vital knowledge for understanding based upon elements of common sense and creative thinking. Notably, it helps in designing interventions for students that can train them to properly and efficiently use AI tools responsibly while wielding them, possibly removing any sense of writing anxiety (Hosseini et al., 2023). However, the ethical aspects such as institutional transparency and ensuring integrity in the prevention of plagiarism felt during this examination of AI within academic writing play an equally vital role. Subsequently, it reflects the broader context where the comprehensive analysis of AI in academic writing is only contained within a concept that

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filters knowledge through the digital paths already present for educators to prepare their students thoroughly for this floor where technology and academia dance.

1.1. Research Objectives

The objective of this study is to review the implications of leveraging AI in students' academic writing.

2. Literature Review

Studies have investigated the use of artificial intelligence in the context of academic writing, emphasising the benefits and potential issues. AI tools evaluate students' writing proficiency, self-confidence, and understanding of academic honesty (Malik et al., 2023). Rabbianty et al. (2023) highlight the significance of ensuring appropriateness in grammatical checks, referencing, and plagiarism checks. AI-driven writing tools have a beneficial effect on students' writing skills by offering prompt feedback and improving the efficiency of grading (Dong, 2023; Marzuki et al., 2023). Furthermore, Chen et al. (2024) report that AI-assisted tools can assist students in the development of better organization and coherence present in their academic writing.

However, there are reservations over the preservation of authorship, as well as enquiries on creativity, critical thinking, and ethics (Kumar, 2023). Faculty members are progressively using AI techniques, which highlights the need for explicit rules (Rabbianty et al., 2023). Students have shown a keen interest in the GitHub API texture, specifically in the integration of AI units to enhance and simplify the learning process (Utami et al., 2023). To successfully use AI, a balanced approach is crucial, which involves incorporating critical thinking and integrating important, interrelated use cases into a current system (Noonen & Baek, 2023). Since advanced students have too high a proficiency level, they can easily distinguish text produced by artificial intelligence from written by humans (Krajka & Olszak, 2024).

The application of AI techniques in academic writing has sparked considerable interest and debate about both the impact on student instruction and the future of authorship; multiple inquiries into the potential benefits and challenges of applying AI to student academic writing have been undertaken. A study by Rabbianty et al. (2023) examines the transformational effects of AI on authorship and academic writing processes. According to the study, one can see the advantages of AI-equipped devices and AI applications in augmenting students' academic performance and writing efficiencies. Nadhifah et al. (2024), in turn, examine the viewpoints of prospective English teachers about the application of artificial AI in enhancing writing skills.

Besides, Maphoto et al. (2024) the potential of AI, generative AI, particularly, which can enhance the writing skills of students of distance education. According to Tang et al. (2024), academic voices should openly acknowledge the use of generative AI in scholarly writing since AI has a transformative effect on providing tools and AI models such as ChatGPT and Bard for writing and enhancing writing ideas. Also, Mahapatra (2024) conducted a mixed-methods intervention research to determine how ChatGPT can impact ESL students' academic writing skills. The study yielded reliable findings that are similar to a large body of studies on AI-driven tools' effects on students' writing skills. The research shows that AI technologies, including ChatGPT, have the potential to enhance students' writing abilities.

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Additionally, in their study, Hz et al. (2023) indicate that AI can be used as tools to assist humans in the writing process, the presence of AIWTs should be considered a potential asset depending on the user's approach. On the other hand, Dawa et al. (2024) analysed university students' perceptions of ChatGPT and their technological competencies. This source points out the benefits of the use of AI assistants such as ChatGPT in higher education and for academic writing tasks to be more precise. Wulandari et al.'s (2024) research underscores the impact of such technologies on teachers' English writing skills and further teaching methods. Ginting et al. (2023) points to the positive impact of the use of such tools as Quillbot and Grammarly on English as a Foreign Language (EFL) college students' use of AI writing tools.

Additionally, the study by Amirjalili et al. (2024) is a comparative analysis of AI-generated text and human academic writing in English literature. The authors note that as the role of AI in the writing process grows, academic writing is experiencing a serious transformation. Another work of literature is the study conducted by Sarkar and Kumar (2024). The authors study the effect of artificial intelligence on university students. They emphasise that the students were offered such benefits of AI as personalised learning, quick and constructive feedback, and greater accessibility, which is beneficial for students with some kind of impairment. In their turn, Rojas (2024) provides an analysis of the use of ChatGPT in scientific writing tasks and in particular explores the experiences and attitudes of students who used ChatGPT in different writing stages.

To sum up, the research on the implementation of AI in students' academic writing reflects the great ability of AI tools to improve writing skills, give feedback, and contribute greatly to the total academic achievement of the students. Even though there are a variety of concerns related to academic integrity, plagiarism, and the reduction of critical thinking abilities, in general, the studies show that AI has a positive impact on students' writing skills if is used responsibly and ethically. There are some concerns about the use of AI, which may result in academic integrity issues, encourage plagiarism, reduce critical thinking skills, and devalue educational efforts and the degrees received. However, studies suggest that AI can improve students' writing skills when used appropriately and ethically. This is why educators need to provide guidance and promote responsible AI use to enable students to use it efficiently and adhere to the principles of academic integrity and critical thinking.

3. Research Methods

This study employed a review analysis approach, examining relevant literature based on the specified keywords. The methodology of this study includes (Figure 1): (a) a technique for searching the literature; (b) determining inclusion and exclusion criteria; and (c) a review analysis process.

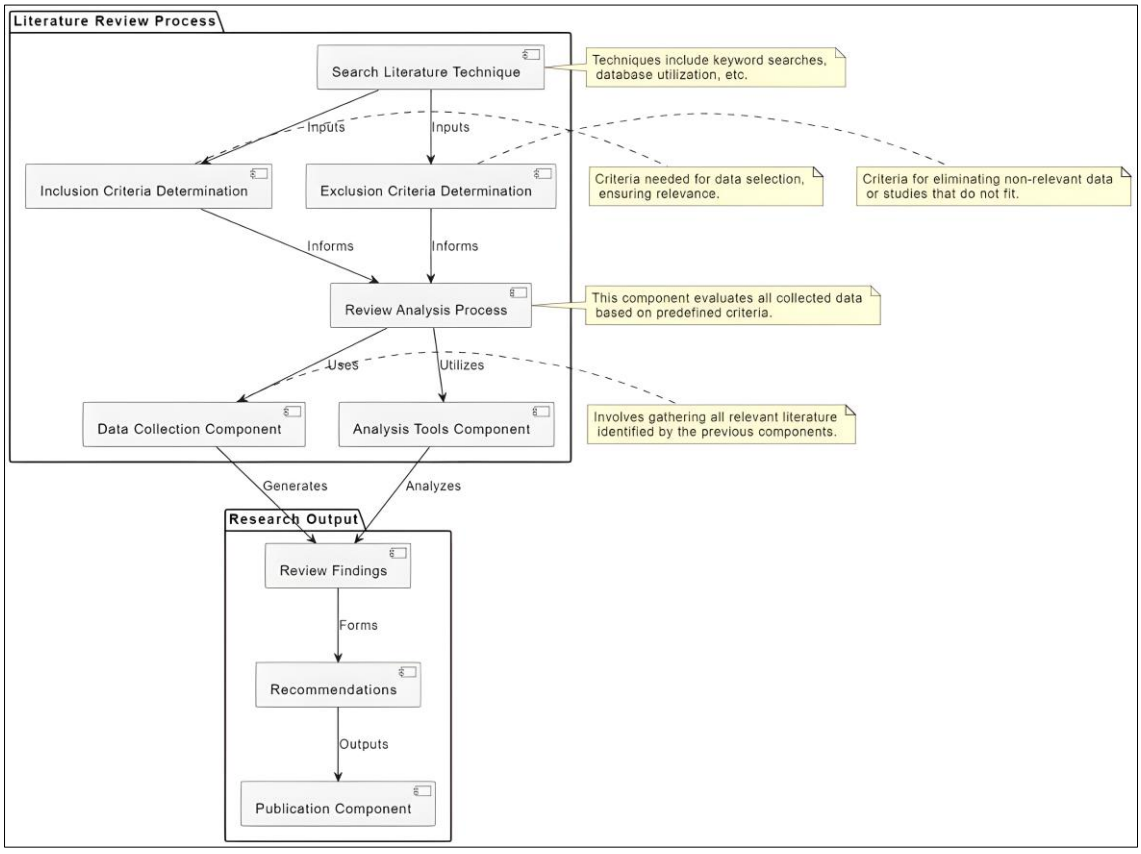
3.1. Technique for Searching the Literature

To conduct the study presented herein, a systematic review analysis has been utilised. The search approach involved the selection of relevant studies from the following databases: JSTOR, IEEE Xplore, ACM Digital Library, ScienceDirect, and Google Scholar. The search terms included various combinations and permutations of the following: 'Artificial Intelligence', 'Student Academic Writing', 'AI in Education', 'AI in Writing', and 'Writing Analysis'. No restrictions as to the publication date were put in place as the

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search was intended to be comprehensive, and all the relevant materials in question had to be included.

Figure 1: The Flow Chart of the Technique for Searching the Literature, Inclusion and Exclusion Criteria, and Review Analysis Process.



3.2. Determining Inclusion and Exclusion Criteria

To ensure the top quality and relevance of the eligible papers, this study came up with a list of the inclusion and exclusion criteria. The inclusion criteria included: (a) research on the use of AI in student academic writing; (b) research offering consistent and clear outcomes or conclusions regarding the implications for writing; and (c) works written in English. As for the exclusion criteria, they were comprised of: (a) inaccessible studies of insufficient quality; (b) research that had not been peer-reviewed and could not be considered scholarly, including blogs and opinion pieces; and (c) studies dedicated to other areas that did not target student writing in particular. This study followed a rigid methodology to make sure that we were evaluating the most relevant and top-notch papers.

3.3. Review Analysis Process

The procedure of analysing the review has included many steps. First and foremost, the titles and abstracts of the papers that have been found have been checked concerning the pre-established inclusion and exclusion criteria. In the second step, the final papers that had been included and qualified for further examination were systematically analysed as a whole. The extracts of the data, which was the third step, included such details as, for example, study aims, particular AI technologies utilisation, student academic writing setting, and primary outcomes. The last step, the fourth one, included the application of a

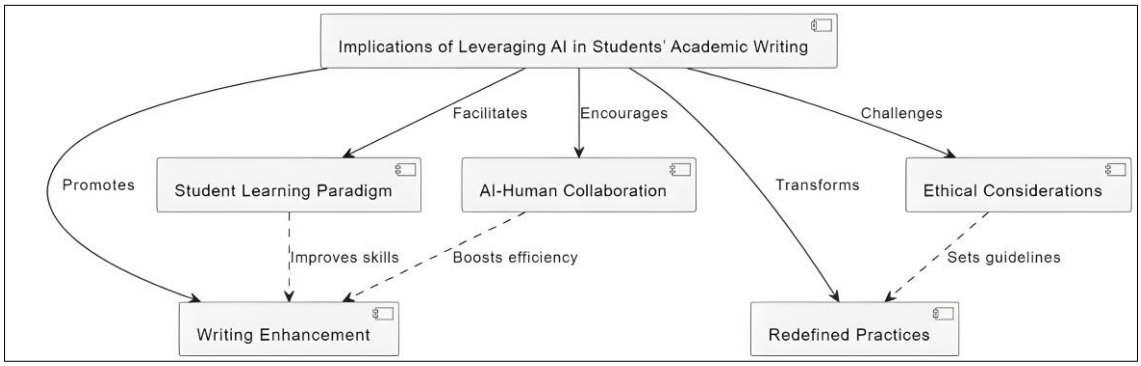
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thematic analysis procedure to find any predominant themes, and patterns revealed by the data about the consequences of using AI in student academic writing. As a result of the review study, the findings concerning the current usage of AI in academic writing and its future benefits and challenges were obtained.

4. Results and Discussion

The review analysis identified several implications of leveraging AI for students' academic writing. They include, but are not limited to (Figure 2): (a) paradigm shift in learning; (b) ethical considerations and research integrity; (c) enhancing writing abilities and efficiency; (d) redefining academic writing practices; and (e) collaboration between AI and human writers.

Figure 2: The Framework of Significant Implications of Leveraging AI in Student Academic Writing.



4.1. Paradigm Shift in Learning

There is an increasing use of AI in student academic writing, which reflects the significant changes in how students learn and produce scholarly content. Such AI solutions as grammar and plagiarism detection software, language translators, and recommendations for content enhancements give students new opportunities to improve their writing skills. Such a shift requires a reconsideration of the teaching and learning frameworks, which now should aim at training not only the student's writing skills but their AI skills as well. Using AI as a supplementary tool, students will be able to improve their writing process and get helpful tools and recommendations to enhance their academic performance.

AI has revolutionised education by changing the conventional aspects of focusing on student-centred learning, personalised experiences, and creative teaching practices. According to research conducted by Ifenthaler et al. (2024), Tang et al. (2024), Ayeni et al. (2024), Rashmi (2023), Kadaruddin (2023), and Abuodha and Kipkebut (2024) show that AI can revolutionise the field of education. The potential impact of artificial intelligence on education is likely to be colossal, such as adaptive assessment, personalised feedback, and learning analytics improvement (Shaik et al., 2022; Triplett, 2023; Anuyahong et al., 2023). According to Sarwar and Ms Saima (2024), to maximise AI's potential in education, it is essential to ensure that AI is successfully integrated, there should be no ethical problems, and prepare students for future problems of technology nature people have become more dependent on AI (Kitcharoen et al., 2024). Teachers using AI will need to improve their AI skills in the future to meet the growing demand for AI-savvy professionals. The impacts of AI on education are not restricted to personal learning and have broader implications for society and, as a result, AI's literacy and ethical

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education are critical (Park & Kwon, 2023; Lérias et al., 2024). Integrating AI in education may require overcoming barriers such as managing workloads, mapping programs of study, and ensuring they are compatible with pedagogic goals (Banerjee et al., 2021). In conclusion, the impact of AI on education shows the importance of continuous adaptation and creativity to use the potential of its capabilities effectively.

4.2. Ethical Considerations and Research Integrity

The deployment of artificial intelligence in student academic writing raises ethical issues and involves integrity issues. First, AI algorithms are capable of absorbing biases, which can lead to errors, or favouritism when producing information. In addition, it is crucial to consider all the side effects that may occur and be eliminated if the deployment of the AI platforms is assessed as a source of information related to the academic research delivery. Therefore, to protect the integrity of student academic writing, it is crucial to establish ethical writing. Teachers have a significant mission to teach students how to evaluate AI-generated information, check data, and keep their writing ethical. Using these writing skills, students can lay a strong foundation of knowledge and constant and responsible academic interest.

Ensuring ethical issues should be prioritised in the development and use of artificial intelligence. Academics believe that standards should be carefully considered, strictly transparent and properly accountable in AI systems (Ahsan Uddin, 2023). In addition, it is very important to create AI technologies that meet the values of society and thereby ensure justice, transparency and accountability (Li, 2023). Finally, it is possible to ensure that the responsible development, use and control of AI technology will be based on ethical standards through active interaction between academics, governments and commercial organisations (Pugachev et al., 2023). By integrating ethical principles, transparency principles and open research, ethical AI practices are created which can serve as a benchmark for these behaviours (Ma, 2024). Another approach that should be applied is the prioritisation of security, human values and ethical issues in the integration of AI technology in all aspects (Gaubienė, 2024). It is also very important to understand the ethical issues, privacy issues and risks of using all technology before integrating them into all aspects (Althuaini, 2024).

4.3. Enhancing Writing Abilities and Efficiency

AI technologies show promise for improving students' writing abilities, self-assurance, and comprehension of academic honesty. Grammar and style checkers can uncover and fix grammatical errors, while plagiarism detection applications aid in upholding research integrity. Language translation tools facilitate the efficient communication of concepts in multiple tongues, thus expanding students' global outreach. AI-driven applications that craft essay outlines and offer recommendations for enhancing material may help students structure their writing and raise the overall quality of their work. Through using AI, students may enhance their composition skills, resulting in increased efficiency and proficiency. This, in turn, will strengthen their academic performance and furnish them with the necessary instruments for achieving success in the future. Long sentences with complex syntax and varied structure can both deepen meaning and engage readers through intriguing formulations. By augmenting students' control of diverse sentence patterns, AI shows promise for improving verbal dexterity and dynamism.

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The adoption of AI is beneficial in enhancing writing skills and productivity. Evidence reveals that AI-powered writing tools enhance writing competence, satisfy psychological needs, and improve students' writing proficiency by providing immediate feedback (Rahayu et al., 2024; Al-Raimi et al., 2024). AI also enhances writing proficiency and reduces time invested, particularly in scientific articles (Švab et al., 2023; Abdul Rahman et al., 2022). The use of AI-powered tools, such as Quillbot and Grammarly, produces positive emotions for students who become encouraged and effective in producing quality written work (Ginting et al., 2023). Furthermore, AI is highly effective in enhancing English language learning, particularly the writing domain, and may facilitate the development of diagnostic systems for detecting learning difficulties (Pratama & Hastuti, 2024; Kunhoth et al., 2024). Therefore, the adoption of AI in educational contexts, including writing instruction, can transform modes of instruction and accelerate academic success (Lameras & Arnab, 2021; Chen, 2022).

4.4. Redefining Academic Writing Practices

Integrating AI in student academic writing transforms traditional writing methods. AI programs can help young authors by providing grammar help, optimising sentence construction, and generating ideas for writing. At the same time, it is important to ensure that the tools correspond to the exact needs and norms of scholarly writing. Proper training and assistance will be required for instructors and students to use AI technologies efficiently in academic practice. Once the partnership between AI and students is established, academic writing approaches could be expanded with innovative elements, which will increase creativity, critical thinking, and the ability to express unique ideas.

The use of AI has many implications for academic writing, whether in authorship, issues of plagiarism, or elements of ethics (Rabbianty et al., 2023; Hutson, 2024). The impact of AI on academic writing is accelerated by the use of modern technology, and it is becoming more widespread today. Thus, AI technologies revolutionise students' ability to produce academic writing by learning English as a foreign language (Selim, 2024). The overall purpose of it is to enrich academic performance and accelerate it even with linguistic barriers. Incorporating the use of AI in academic writing is more advantageous in creating content and generating ideas but raises the issue of originality and academic proficiency (Ahn & Al, 2024; Miao et al., 2023). Some AI technologies may improve students' academic abilities to write better, their ways of teaching and learning, and create a unique student feedback mechanism (Wang, 2024; Maphoto et al., 2024; Wu, 2024a). However, using AI in academic writing raises some ethical and practical difficulties that need to be addressed (Syabilla et al., 2023). In short, artificial intelligence thinking improves and as it develops, educators need to shift their teaching methods as AI nurture critical thinking skills beyond the outcomes of AI (Dergaa et al., 2023).

4.5. Collaboration between AI and Human Writers

The implementation of AI in student academic writing is perceived to be a joint effort that is shared by both AI and human writers. Although AI technologies may provide some kind of support, there are some aspects that students do. First, AI has to potential to replace students' creativity, critical thinking, and unique perspectives that they bring to their writing. Therefore, AI is viewed as a tool that has the potential to enhance and magnify students' talents rather than replace them. Second, human writers are more likely to make a better judgment, utilising beforehand knowledge, and humans can easily distinguish the

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difference between a well-known exception in the field of writing. Maintaining a balance between using AI tools and preserving the student aspect of academic writing will allow students to enhance their writing skills while benefitting from the convenience that AI has to offer.

There is a growing interest in the potential of collaboration between AI and human writers in academic writing. The development of material by AI can be enabled using human contribution, leading to collaborative authorship (Rabbianty et al., 2023). This collaboration combines writing teaching and assessment through the convergence of writing technologies and the expertise of human professionals (Nguyen & Tran, 2023). Using AI and human input in a complementary way, the collaboration may potentially result in increased productivity and novel working techniques (Chen et al., 2024). As a result, the guidelines primarily relate to the appropriate use of AI in academic writing by fostering cooperation between developers researchers and editors (Hryciw et al., 2023). The guidelines secondarily relate to the development and facilitation of AI tools that assist academic writing processes and development on content curation or enhancement, improvement of writing proficiency, and feedback for the students (Wu, 2024b). Since we are at an early stage of identifying how AI can be used to enhance academic writing, our guidelines are directed toward both literary production and academic writing (Hou et al., 2022). Although AI can be used to facilitate academic writing, several factors need to be taken into account, including, but not limited to, correctness, plagiarism, and limits of editing (Nazzal et al., 2024). As a result, the incorporation of AI into the writing processes in a manner that is both responsible and effective can potentially improve originality, clarity, and conciseness (Deb et al., 2023).

5. Conclusion

In conclusion, leveraging AI as a supplementary tool has revealed several positive implications for students' academic writing and has considered the significance and relevance of these findings. To begin with, the use of AI implies that students become empowered due to the significant change in their study strategy. Moreover, building responsible writing habits is promoted, with students becoming more advanced in their chosen fields and getting additional technical and writing skills. The students' writing productivity experiences significant improvement, and businesses can also benefit from new exciting phenomena. The ways of student academic writing are redefined, and finally, cooperation between AI and human writers is recommended. Thus, when developing student writing skills with AI, the major factors to consider are not the potential ethical issues since AI can only have positive effects on the writing process. Educators and students should understand the consequences of the exploitation of AI to do their best and not compromise the quality of the work. The vicarious liability should be reconsidered to minimise the loss of the use of AI as a supplementary implement.

Besides, the utilisation of AI in academic writing has also drastically transformed the approach with which students handle their tasks. With this in mind, students can benefit from AI-driven tools when it comes to streamlining the process of writing itself, improving the quality of literature review, and successfully elevating the articles they write. These modern technologies incorporate tools that automatically apply all sources and automatically create reference lists and check for potential plagiarism included. The devices they offer also come in the form of grammar and style checkers and may proceed to write the most challenging or non-creative segments of the articles as well. Moreover, AI can also be instrumental in the processing, analysis, and visualisation of data, which

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would enable the students to present complex material more efficiently. What is more, better and more efficient use of such tools is often directly proportional to the students' productivity, which would further allow them to allocate more focus on the actual overarching point they will make and the intricate aspects of their discipline.

For additional studies, a broader discussion of the ethical concerns associated with the leverage of AI in academic writing will have to be developed. It seems that some of the questions that need to be explored would include determining possible biases and limitations associated with the use of AI-driven technologies for writing and solving the concerns related to the confidentiality of information and data protection. In the case of conducting long-term research, among the tools for collecting data and analysing its effects on students' academic writing, the recognition of lasting impacts or lack of such will be considered. Furthermore, it will be significant to investigate which fields of academic writing include the use of artificial intelligence and compare its efficiency to the traditional methods to determine more precisely in which fields AI may be qualified as a more successful tool for use and in which the human intervention continues to remain critical. Similarly, the exploration of the ways AI can help to develop more diverse and inclusive viewpoints in academic writing can help to justify the use of artificial intelligence as a part of a fairer scholarly setting in writing. Overall, the conducted studies are likely to be focused on the further development and expansion of AI use in academic writing, while following ethical requirements and meeting the changing needs of both students and instructors.

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Conflict of Interest

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