THE UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI) IN ACADEMIC WRITING OF HEALTHCARE STUDENTS

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ABSTRACT

The integration of artificial intelligence (AI) in academic writing presents both opportunities and challenges in modern communication. While AI-driven writing tools promise to enhance efficiency, creativity, and accessibility in content creation, concerns arise regarding the potential biases, ethical implications, and impact on human autonomy. This paper examines the extent healthcare students take to utilize AI-driven writing assistance tools in the academic writing process and the extent AI-driven writing assistance tools influence English language writing proficiency of healthcare students. To examine the utilization of AI in students' written works, their written works are submitted and analysed using Quillbot AI generator to obtain the percentage of AI used on generating the content. The similar dataset was then graded manually using the assessment rubric to analyze the influence of AI on English language writing proficiency of the healthcare students. The result indicated that there is no significant relationship between the two scores. Although AI provides students with valuable support in tasks ranging from grammar correction, language refinement, content generation to idea generation, the reliance on AI tools may also raise questions about the decline of critical thinking skills and the loss of authentic voice in written expressions.

Keywords : Artificial Intelligence (AI), academic writing, healthcare students

1. Introduction

The integration of artificial intelligence (AI) in academic writing is transforming the educational landscape, particularly within the healthcare sector. This transformation is driven by the potential of AI to enhance efficiency, creativity, and accessibility in content creation. As healthcare students navigate the complexities of academic writing, AI-driven tools offer significant support, from grammar correction and language refinement to content and idea generation. However, the reliance on AI in academic writing also raises several concerns, including potential biases, ethical implications, and impacts on human autonomy and critical thinking skills.

AI technology's capability to augment the writing process is not a novel concept; it has been evolving steadily over the past decade. In particular, AI applications in education have garnered substantial attention due to their ability to personalize learning experiences and provide instant feedback. Studies have shown that AI tools can significantly improve the quality of academic writing by offering sophisticated grammar checks and style suggestions (Hale, 2020). These tools can also aid in plagiarism detection, ensuring the originality of students' submissions (Smith & Wiggins, 2021).

The utilization of AI in academic writing among healthcare students is of particular interest due to the unique demands of their discipline. Healthcare education emphasizes precision, clarity, and adherence to specific terminologies, making AI tools especially valuable. Research indicates that healthcare students increasingly rely on AI to manage these requirements efficiently. For instance, AI-based platforms like Turnitin not only detect plagiarism but also provide insights into the extent of AI utilization in student submissions (Turnitin, 2022). This dual functionality helps educators

monitor and guide the appropriate use of AI in academic work, ensuring that students benefit from these technologies without compromising their learning objectives.

However, the integration of AI in academic writing is not without its challenges. One significant concern is the potential for AI tools to introduce biases in written content. AI systems are trained on large datasets that may contain inherent biases, which can be inadvertently propagated in the students' work. This issue underscores the importance of developing and implementing AI technologies that are transparent and ethically sound. Additionally, there is a growing debate about the impact of AI on critical thinking and the authenticity of students' voices in their writing. As students rely more on AI for content generation and language refinement, there is a risk that their own analytical and creative abilities may diminish (Jones & Thompson, 2021).

The perception of AI among healthcare students also plays a crucial role in its adoption and effectiveness. Surveys conducted to gauge students' attitudes toward AI in academic writing reveal a generally positive outlook. Students appreciate the efficiency and accuracy that AI tools bring to their writing process, acknowledging that these tools help them manage their workload more effectively (Rahman et al., 2022). However, there is also a recognition of the need to balance AI usage with the development of essential academic skills, such as critical thinking and originality.

In conclusion, while AI offers considerable benefits in enhancing the academic writing capabilities of healthcare students, it is imperative to address the associated ethical and educational challenges. By fostering a balanced approach that combines the advantages of AI with the cultivation of critical academic skills, educators can ensure that students harness the full potential of these technologies responsibly.

2. Literature Review

The incorporation of artificial intelligence (AI) in academic writing is a burgeoning area of research, particularly in the context of healthcare education. The advent of AI has brought about significant transformations in how students' approach and execute their writing tasks. This literature review examines the current advancements, benefits, and challenges associated with AI in academic writing, with a focus on its application among healthcare students.

2.1 Advancements in AI for Academic Writing

AI technologies have evolved to offer robust support in various stages of the writing process. Tools such as Grammarly, Turnitin, and ChatGPT provide comprehensive assistance from grammar correction and plagiarism detection to content generation and idea organization. These advancements are especially pertinent in healthcare education, where precision and clarity are paramount. According to Golan et al. (2023), AI tools significantly enhance the quality of academic writing by providing sophisticated grammar and style suggestions, thereby helping students produce more polished and coherent texts. These tools also play a crucial role in maintaining academic integrity by detecting potential instances of plagiarism (Turnitin, 2023).

2.2 Benefits of AI Integration in Academic Writing

AI-driven tools have been shown to improve efficiency and productivity in academic writing. They provide immediate feedback on language use and structural coherence, which is invaluable for healthcare students who often face rigorous writing standards. AI's ability to offer real-time

suggestions helps students refine their ideas and arguments more effectively, as noted by Dobrin (2023). Moreover, AI tools can assist in generating outlines and brainstorming ideas, thus fostering creativity and helping students manage their time better (University of North Carolina at Chapel Hill, 2023).

The positive perceptions of AI tools among students further underscore their benefits. Surveys indicate that students appreciate the enhanced efficiency and accuracy these tools bring to their writing process (Rahman et al., 2022). This is particularly relevant in the healthcare field, where students must balance heavy academic loads with practical training. AI tools thus provide a critical support mechanism, enabling students to focus more on content quality and less on mechanical aspects of writing.

2.3 Challenges and Ethical Considerations

Despite their advantages, the integration of AI in academic writing is not without challenges. One major concern is the potential for AI tools to introduce biases in written content. AI systems are trained on large datasets that may contain inherent biases, which can be inadvertently propagated in students' work. Stone (2023) emphasizes the need for developing AI technologies that are transparent and ethically sound to mitigate such risks. Additionally, there is an ongoing debate about the impact of AI on critical thinking and the authenticity of students' voices. As students increasingly rely on AI for content generation, there is a risk that their analytical and creative skills may diminish (Jones & Thompson, 2021).

Another significant issue is the potential for AI to generate misleading or incorrect information. Narayanaswamy (2023) points out that AI tools, while useful, may not fully grasp the nuances of complex research topics, potentially leading to misrepresentations. This highlights the importance of a collaborative model where AI assists in drafting while human researchers ensure intellectual coherence and accuracy (Turnitin, 2023).
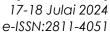
The utilization of AI in academic writing presents both opportunities and challenges for healthcare students. While AI tools enhance writing efficiency and quality, it is crucial to address ethical considerations and ensure that these technologies do not undermine critical academic skills. By fostering a balanced approach that leverages AI's strengths while preserving human intellect and creativity, educators can help students maximize the benefits of these innovative tools responsibly.

3. Research Methodology

This study adopts a mixed-methods research design, integrating both quantitative and qualitative approaches to comprehensively examine the utilization of artificial intelligence (AI) in academic writing among healthcare students. This design allows for a thorough investigation of both the extent of AI usage and the perceptions and experiences of the students (Creswell & Plano Clark, 2018).

3.1 Theoretical Framework

To establish a suitable theoretical framework for studying the utilization of artificial intelligence (AI) in the academic writing of healthcare students, the Technology Acceptance Model (TAM) is a robust and widely accepted choice. TAM is particularly useful for understanding how users come to accept and use technology. It posits that perceived usefulness (PU) and perceived ease of use (PEOU) are primary determinants of technology acceptance and usage behavior (Davis, 1989).

1. **Perceived Usefulness (PU):** Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance. In the context of AI in academic writing, this would translate to the extent healthcare students believe AI tools can improve the quality, efficiency, and productivity of their writing. Research indicates that healthcare students find AI tools beneficial for grammar correction, language refinement, and plagiarism detection, which are crucial for producing high-quality academic texts (Golan et al., 2023).

2. **Perceived Ease of Use (PEOU):** Perceived ease of use is defined as the degree to which a person believes that using a system would be free of effort. For healthcare students, this involves how easy they find it to integrate AI tools into their writing processes. AI tools that are user-friendly and require minimal effort to learn and operate are more likely to be adopted (Turnitin, 2023). The intuitive interfaces of contemporary AI writing tools, such as Grammarly and Turnitin, contribute to their perceived ease of use.

3. **Attitude Toward Using (ATU):** The attitude toward using AI tools in academic writing is influenced by both PU and PEOU. Positive experiences and perceived benefits can lead to a favorable attitude, thereby increasing the likelihood of continued use. Studies show that healthcare students generally have a positive attitude towards AI, appreciating its role in enhancing writing efficiency and quality (Rahman et al., 2022).

4. **Behavioral Intention to Use (BI):** Behavioral intention to use AI tools is a direct predictor of actual usage. This intention is shaped by the attitude towards using the technology, which in turn is influenced by PU and PEOU. Healthcare students' intention to use AI tools is often strong when they perceive significant advantages in their academic writing processes (Jones & Thompson, 2021).

3.2 Data Collection Method

Participants

The participants of this study are undergraduate healthcare students from KPJ Healthcare University, currently in their fourth semester doing Diploma in Pharmacy. A total of 46 students were selected as representative sample. The inclusion criteria will be students who have used AI tools for their academic writing tasks at least once in the past semester.

Data Collection

The students were given a task to write a compare & contrast essay, in pairs, as part of their coursework assignment. They were also given freedom to choose any topic of their interest. The assignment was administered to the students during the semester and they were given three weeks to complete the assignment. The administration of the essay was conducted through Google Classroom site, while the submission was done in both softcopy through the same site and hardcopy to the researcher.

Data Analysis

The collected data, as a single dataset, was compared to gain a comprehensive understanding of how AI-driven writing assistance tools influence English language writing proficiency among healthcare students.

Firstly, participants' written works were analyzed using Quillbot to determine the extent of AI-generated content. This involved submitting students' papers to Quillbot and obtaining a detailed report on AI usage percentages.

Then, participants' written works were graded using the assessment rubrics to evaluate the quality of written English language produced by healthcare students. Some of the guidelines in the rubrics include organization and development of ideas, comparison and/or contrasting points, mechanics and sentence structure, transition of ideas, as well as format, citation techniques, and references. A second rater is also assigned to avoid confirmation bias.

4. Findings

A total amount of 23 compare & contrast essays were collected for this data. The average score of AI-generated content is 58.4%, and the average assessment rubric score is 60%.

4.1 AI-Generated Content Score

Among the collected data, 5 essays were classified as having 100% AI-generated content and 2 essays were classified as having 0%.

Table 1: Highest AI-generated score

No.	Data	AI-generated (%)	Assessment rubric (%)
1.	Essay 14	100	51
2.	Essay 20	100	56
3.	Essay 23	100	56

Most of the essays that were classified as highest for AI-generated content score are lacking in terms of organization and development of ideas. The essays are often generic without reflecting the compare & contrast genre. The absence of academic writing structures such as thesis statement and topic sentences in those essays are prominently affecting their assessment rubric scores too since the flow and transitions between each paragraph are unclear.

Table 2: Lowest AI-generated score

No.	Data	AI-generated (%)	Assessment rubric (%)
1.	Essay 2	0	71
2.	Essay 8	0	78
3.	Essay 9	15	47

Both essays that were classified as having 0% of AI-generated score content received relatively high score in terms of organization and development of ideas. There is a clear structure of academic writing in both essays that clearly illustrates the flow and transitions between each paragraph. Intriguingly however, the second lowest score of AI-generated content received a below average score of assessment rubric. Despite their good effort in maintaining integrity, the students' lower proficiency of English language has unfortunately affected their overall marks.

4.2 Assessment Rubric Content Score

The similar data was then manually graded using the assessment rubric. The scores ranged between 88 to 36 marks without any significant difference between each mark.

Table 3: Highest assessment rubric score

No.	Data	Assessment rubric (%)	AI-generated (%)
1.	Essay 19	88	100
2.	Essay 22	84	95
3.	Essay 21	82	94

It is interesting to note that students who scored high in assessment rubric also scored high in AI-generated content. The high assessment rubric score is mainly due to clear organization and development of ideas in the essays that evidently reflects the compare & contrast genre. The essays also followed the correct academic structure by having proper thesis statement and topic sentences which clearly illustrate the flow and transitions between each paragraph.

Table 4: Lowest assessment rubric score

No.	Data	Assessment rubric (%)	AI-generated (%)
1.	Essay 12	36	61
2.	Essay 4	40	20
3.	Essay 7	45	24

On the other hand, the essay that scored lowest in the assessment rubric apparently has an above average AI-generated score. The content of this essay does not reflect the compare & contrast genre, instead it inclines towards opinion genre where the essay is deemed bias towards one of the two options. The other two essays that are among the lowest scores for assessment rubric have relatively lower score of AI-generated content as well. This is similar to the third data in Table 2 where the students' lower proficiency of English language has affected their overall marks despite their effort in maintaining integrity.

4.3 Discussion

Some of the students who scored very high for AI-generated content received only average assessment rubric score but some also obtained the highest score for the same category. It is presumed that the latter correctly used the right prompt in the AI-generated writing assistance tools that subsequently helped them to reduce their writing time and writing errors efficiently.

There is also a clear disparity between students that scored low in AI-generated content where those who scored 0% obtained quite high marks for assessment rubric score while those who minimally utilized AI-driven writing assistance tools scored below average in their assessment rubric. This is mainly due to the students' low proficiency in English language that negatively affected the flow and transitions of their writings.

5. Conclusion

In conclusion, it can be seen that the optimum usage of AI-generated is still considered as new for the current generation due to assumably less knowledge in generating the right prompt to fully

accommodate the structures required for academic writing. Generally, the incorporation of AI in academic writing possesses both enormous potential and considerable obstacles. This study revealed the importance of acquiring the right knowledge to fully utilize AI-driven writing assistance tools. Furthermore, the study further proved the possible benefits of using AI in academic writing which include assisting students to brainstorm ideas, generate content, reduce errors, and manage their time efficiently. All things considered, utilizing AI-driven writing assistance tools in academic writing could be challenging but the rewards might be great. This progress will not only improve students' educational experiences but also will prepare them for future challenges in technology advancement.

6. Rujukan (Bernombor, Bold, Times New Roman, 12, APA style)

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