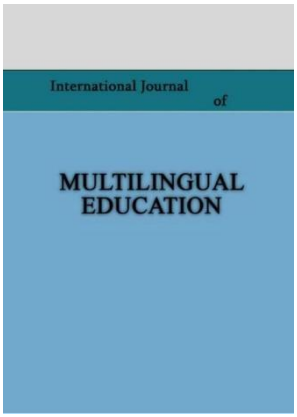

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The Integration of ChatGPT in Academic writing: Exploring perceptions and effectiveness of the students

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The Integration of ChatGPT in Academic writing: Exploring perceptions and effectiveness of the students

ABSTRACT

This paper explores the integration of ChatGPT as a technological aid in the academic practices of BA and MA pharmacy students at the University of Tetovo (North Macedonia). The research also examines the perceived benefits, such as enhanced efficiency, improved linguistic accuracy, and access to diverse perspectives, alongside challenges like potential over-reliance, accuracy of content, and academic integrity concerns. By adopting a quantitative approach, a student survey, the study seeks to understand students' attitudes toward this AI tool, delving into their perspectives on its utility, and their experiences using ChatGPT for their academic purposes.
The findings reveal that students generally perceive ChatGPT as a valuable tool for enhancing academic practices, particularly in areas such as generating ideas, improving writing quality, and accessing quick information. However, concerns were also noted regarding the reliability of generated content and the risk of dependency on AI tools for critical thinking and problem-solving.

Keywords: *ChatGPT, pharmacy, academic writing, critical thinking*

Introduction

The rapid advancements of technology especially artificial intelligence (AI), have significantly transformed education because AI- tools are increasingly being integrated into academic practices in all fields of studies. Among these tools, ChatGPT, an advanced language model developed by OpenAI, has emerged as a valuable resource for assisting students and educators across disciplines. Its ability to generate coherent, contextually relevant, and detailed text has made it particularly appealing for tasks such as report writing, brainstorming, and enhancing written communication skills. However, the adoption of AI tools like ChatGPT in higher education has sparked debates about their effectiveness, ethical implications, and potential impact on learning outcomes and ethical issues.

In the context of pharmacy education, where precision, critical thinking, and clear communication are crucial, the integration of ChatGPT offers several opportunities and challenges. Pharmacy students often engage in writing detailed reports that require a combination of technical knowledge and well-structured argumentation. The use of ChatGPT in this domain has the potential to streamline the report-writing process, providing students with support in organizing their thoughts, refining language, and ensuring clarity. However, concerns remain regarding the over-reliance on AI, the accuracy of the generated content, and its implications for the development of essential skills such as critical analysis

and independent thinking.

This study focuses on BA and MA pharmacy students at the University of Tetovo, North Macedonia investigating their perceptions of ChatGPT as a tool for writing pharmacy reports. By exploring their attitudes, experiences, and the perceived advantages and challenges, the research aims to shed light on the broader implications of integrating AI in specialized academic fields. Additionally, it examines the extent to which ChatGPT impacts students' academic performance and report-writing skills, aiming to provide insights into its effectiveness as a pedagogical tool. Ultimately, this study seeks to contribute to the ongoing dialogue about the role of AI in higher education, particularly in fostering a balance between leveraging technological innovations and maintaining academic rigor.

Literature review

The integration of artificial intelligence (AI) tools, such as ChatGPT, into academic contexts has gained significant attention in recent years. These tools offer innovative ways to enhance student learning experiences, particularly in disciplines where precision and clarity in communication are paramount, such as pharmacy. This literature review examines the broader use of AI in education and focuses on the implications of ChatGPT in academic writing, emphasizing its potential benefits and challenges.

What is more, AI tools have transformed educational practices, offering solutions for personalized learning, formative assessment, and academic support (Holmes et al., 2019). In academic writing, these tools assist with language proficiency, idea generation, and grammar improvement (Awasthi, 2019). For pharmacy students, who often grapple with specialized terminology and technical communication, AI tools like ChatGPT present an opportunity to enhance linguistic accuracy and efficiency in writing (Pinto et al., 2022). In addition to this, students often use AI for translation from one language to another. Translation exercises can enhance learners' abilities to work independently, fostering Life-Long Learning (LLL) (Tenieshvili, 2023).

ChatGPT, specifically, employs natural language processing to simulate human-like conversations and assist users in generating coherent text. Studies have noted that such tools can support students in brainstorming, summarizing, and refining their writing. For instance, Gao et al. (2023) found that students using ChatGPT reported increased confidence in their writing abilities and a reduction in time spent on assignments.

In general, research highlights several benefits of using ChatGPT in educational settings. Students perceive it as a reliable aid for improving grammar, vocabulary, and coherence in writing (Zheng et al., 2023). Pharmacy students, in particular, may benefit from the tool's ability to provide suggestions

for concise and precise language use, which is critical for scientific communication (Chen et al., 2021). Moreover, ChatGPT offers access to diverse perspectives by generating content informed by a wide range of sources, potentially broadening students' understanding of topics (Lee, 2023). ‘’ It was expected that AI can greatly accelerate drug discovery and development to reduce lifecycle of pharmaceutical products. Therefore, introduction of AI into pharmacy holds great potential to accelerate the drug discovery and development process, reduce costs, and improve patient outcomes” (Zhu et.al.2023, p.1).

Despite its benefits, integrating ChatGPT into academic practices raises concerns. One major issue is the potential for over-reliance on AI tools, which could hinder the development of critical thinking and independent problem-solving skills (Baker et al., 2022). Additionally, the accuracy of the information provided by ChatGPT remains a challenge, as the tool may generate plausible but incorrect or outdated content (Marcus & Davis, 2023). Academic integrity is another critical concern, with some educators worried about students using AI tools to circumvent original thought and effort (Smith & Johnson, 2023). In pharmacy education, where precision and credibility are paramount, ChatGPT's integration must be carefully managed. Educators are encouraged to adopt strategies that combine AI tools with traditional learning approaches, ensuring that students benefit from technological advancements while maintaining academic rigor and ethical standards (Jones & Brown, 2022).

The integration of ChatGPT in academic writing presents both opportunities and challenges for pharmacy students. While it can enhance writing efficiency, linguistic accuracy, and conceptual clarity, it is essential to address concerns about over-reliance, content accuracy, and ethical use. Further research is needed to explore the long-term impact of AI tools on student learning outcomes and professional preparedness in specialized disciplines like pharmacy.

Several studies explored the use of ChatGPT in academic settings. Su, Lin, and Lai (2023) investigated the use of ChatGPT in enhancing argumentative writing among university students. The study highlighted improvements in students' ability to structure arguments and use diverse perspectives. However, challenges like over-reliance on AI and ethical concerns were noted. The results suggested that while ChatGPT is effective as a supportive tool, it must be paired with critical thinking exercises to ensure meaningful learning outcomes.

In addition, Yan (2023) explored the relationship between ChatGPT and academic writing self-efficacy among postgraduate students. The study found that students who used ChatGPT demonstrated increased confidence in tackling complex writing tasks. However, it also pointed to potential dependency on the tool, with students relying on AI-generated suggestions rather than developing their own ideas.

Finally, a study conducted by Govindarajan and Christuraj (2023) examined the opportunities and challenges of integrating ChatGPT into English Language Teaching (ELT) at a university in Oman. The research aims to assess the benefits and challenges of using ChatGPT in English teaching and its impact on educational practices and policy. By employing qualitative methods, including literature review and semi-structured interviews, the study found that while ChatGPT offers promising advantages, concerns regarding over-reliance and the need for proper teacher and student training remain. The study calls for further research to fully explore ChatGPT's potential in ELT and address its associated challenges.

Methods

This study aims to explore the integration of ChatGPT in academic writing and its perceived effectiveness among BA and MA pharmacy students at the University of Tetovo. A survey method was utilized to gather data on students' attitudes, experiences, and perceptions regarding the use of ChatGPT as a writing tool in their academic endeavors.

This study is guided by the following research questions:

Research Questions:

-How do pharmacy students perceive the usefulness of ChatGPT in enhancing their academic writing skills?

-What are the key benefits and challenges experienced by pharmacy students when using ChatGPT for academic writing?

-To what extent do pharmacy students rely on ChatGPT in their academic writing tasks?

Participants

The study sample consists of 50 pharmacy students, both undergraduate (BA) and postgraduate (MA) students from the University of Tetovo. Participants were selected using a purposive sampling method to ensure representation from both academic levels and diverse academic writing experiences.

Data collection method

Data was collected using a structured survey designed specifically for this study. The survey comprised three sections: Demographic Information which consists of the questions related to their academic level (BA or MA), gender, and age. Also, perceptions of ChatGPT using sing a 5-point Likert scale, this section assessed students' views on the usefulness, reliability, and relevance of ChatGPT in academic writing tasks. Finally, the third section is about students' experiences with ChatGPT which

explored how students utilized ChatGPT, the perceived benefits, challenges, and frequency of use. The survey was distributed to 50 students online via the university's learning management system and email. Participants were informed of the study's purpose and assured of confidentiality and anonymity. Informed consent was obtained before data collection.

Results

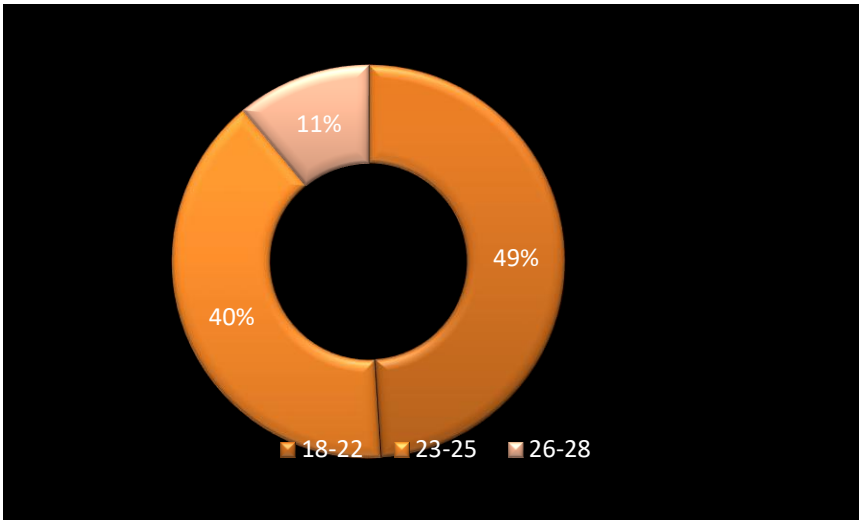
This section presents a detailed analysis of the data collected from the survey, highlighting both the benefits and challenges associated with the use of ChatGPT in academic writing among pharmacy students at the University of Tetovo. The survey results provide valuable insights into how students perceive and utilize this AI tool in the context of their academic work. By examining both the positive outcomes and potential limitations, we aim to understand the broader implications of integrating AI technologies, such as ChatGPT, into higher education, particularly in the field of pharmacy.

The benefits identified by the participants include increased efficiency in generating ideas, enhancing the writing process, and improving overall productivity. Many students reported that ChatGPT helped them overcome writer's block, provided alternative phrasing or vocabulary, and allowed for quicker drafting of assignments. Additionally, the tool was seen as a valuable resource for refining the structure and clarity of written content, contributing to better-organized academic papers.

On the other hand, several challenges emerged from the data, which shed light on areas where ChatGPT's integration into academic writing may require caution. Issues related to accuracy, plagiarism concerns, and over-reliance on AI-generated content were raised by a significant portion of the respondents. Some students expressed concerns that the tool may sometimes produce misleading or incorrect information, especially in complex topics related to pharmacy. Furthermore, the use of ChatGPT raised ethical questions, particularly around the potential for students to rely too heavily on AI-generated material, which might undermine the development of critical thinking and original writing skills.

Overall, the analysis highlights a nuanced perspective on the role of ChatGPT in academic writing, where its potential as a supportive tool is clear, but its limitations and ethical considerations must also be carefully addressed to ensure its responsible and effective use. This section will explore these findings in greater depth, providing recommendations for best practices in utilizing ChatGPT within the academic framework at the University of Tetovo.

Figure 1



The results presented in Figure 1, indicate that the age distribution of participants was primarily concentrated among young adults. A high proportion (49%) of participants were aged 18–22, while the second largest group, accounting for 40%, was aged 23–25, suggesting that the majority were in the early stages of graduate education in pharmacy. Additionally, 11% of participants fell into the 26–28 age range, likely reflecting individuals with more advanced experience or maturity.

Figure 2

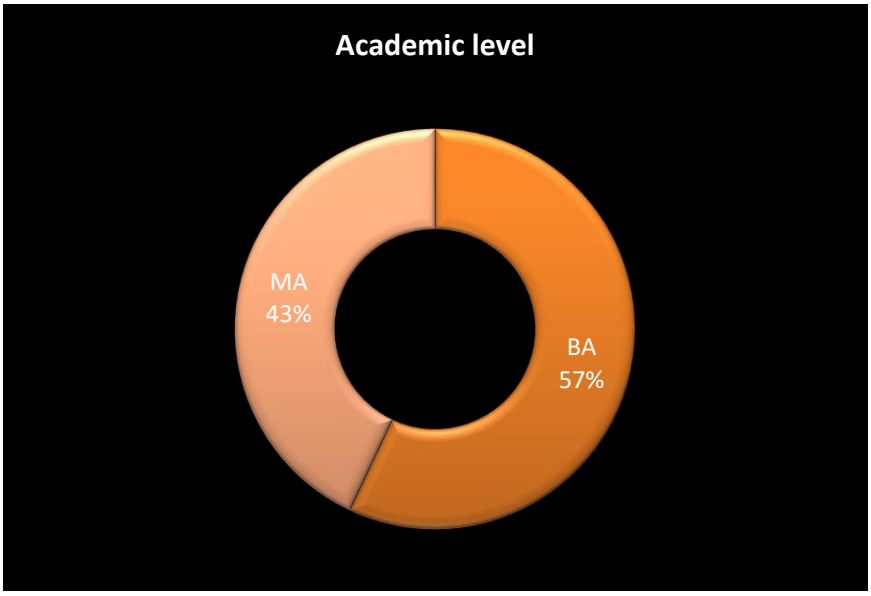


Figure 2 provides an overview of the academic levels of the participants in the pharmacy program. The data indicates that the majority, 57%, are pursuing a Bachelor of Arts (BA) degree, while 43% are enrolled in Master of Arts (MA) studies. This distribution highlights a slightly larger proportion of undergraduate students compared to graduate-level participants.

Figure 3

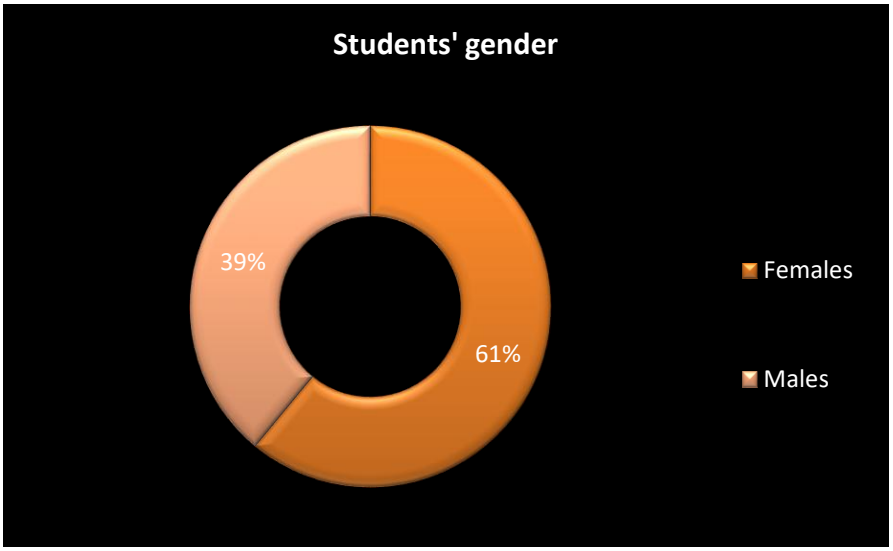


Figure 3 highlights the gender composition of students enrolled in the pharmacy program. The data reveals a notable gender disparity, with 61% of the cohort being female and 39% male. This distribution underscores the prominence of female students in the field, reflecting broader trends observed in many health-related disciplines.

Figure 4

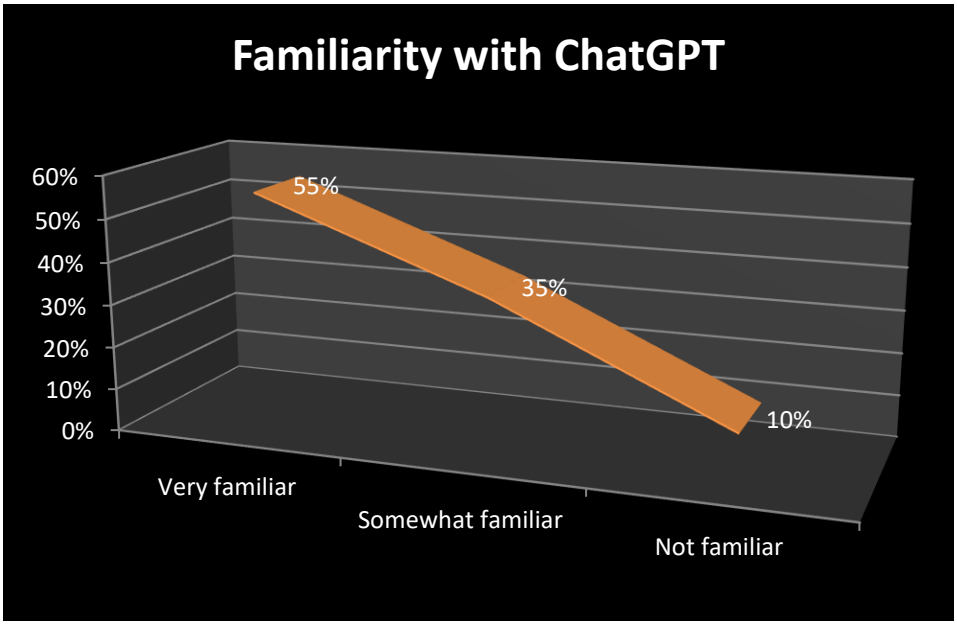


Figure 4 illustrates the varying degrees of familiarity students have with ChatGPT, a popular AI language model. The data reveals that a significant majority, 55%, categorize themselves as "very familiar" with the tool, indicating a strong awareness and potentially regular usage. Meanwhile, 35% of students describe themselves as "somewhat familiar. Lastly, 10% of students' report being "not familiar" with ChatGPT which could be due to accessibility gap or due to limited exposure.

Figure 5

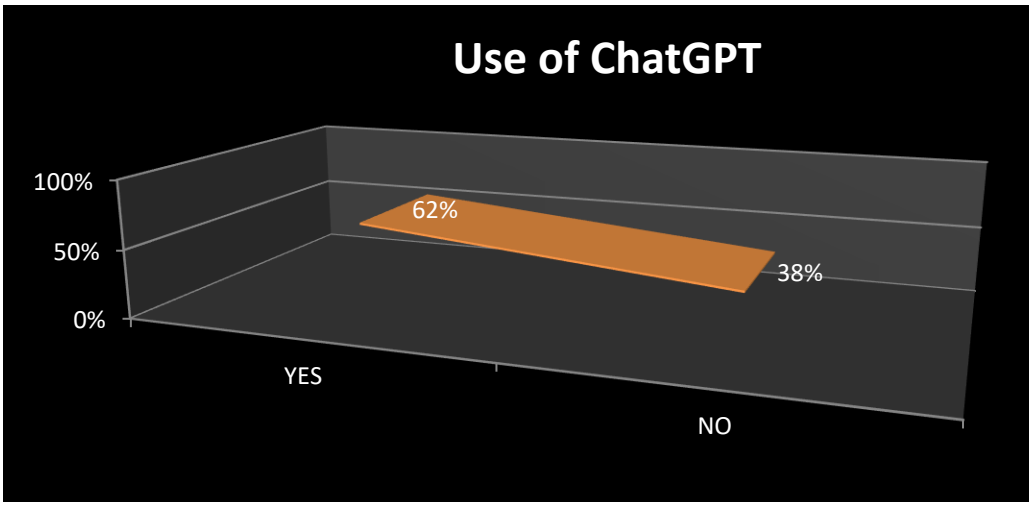


Figure 5 shows that 62% of students reported using ChatGPT for academic purposes, while 38% indicated they do not. This suggests that a majority recognize and utilize the tool's potential to support their academic activities, while a notable minority have yet to incorporate it into their learning practices.

Figure 6

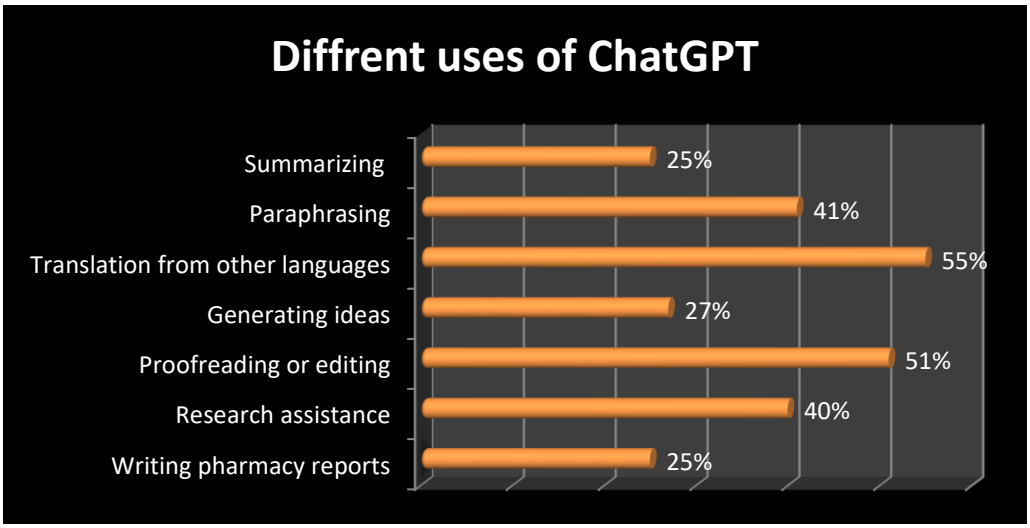
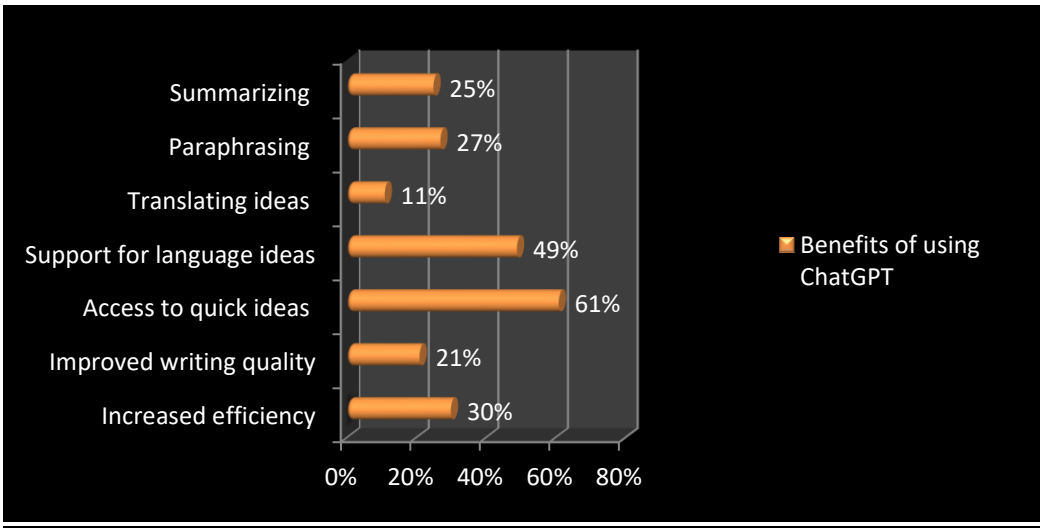


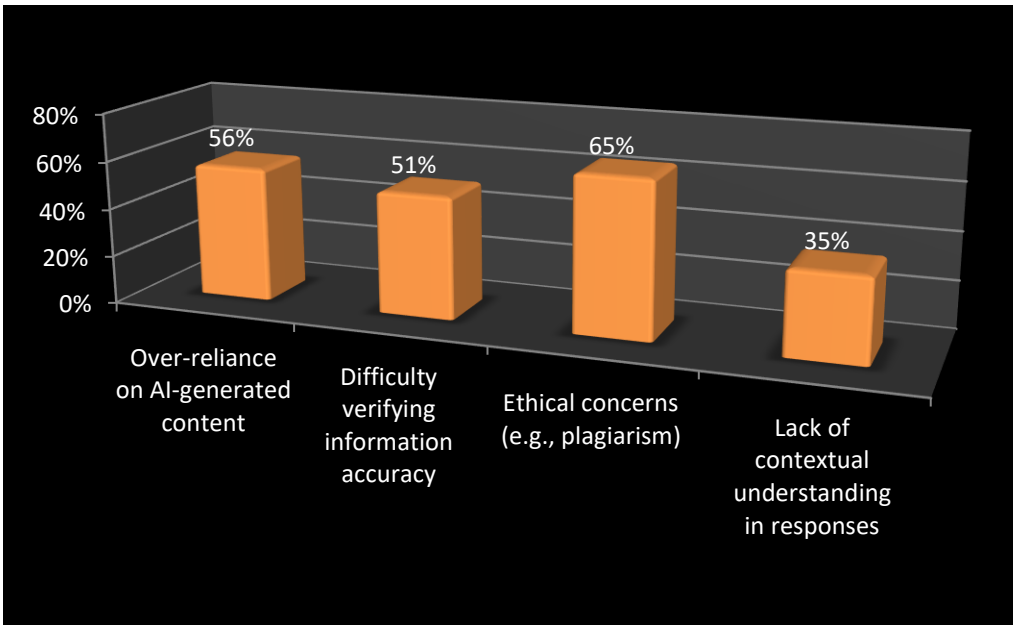
Figure 6 highlights the varied ways students leverage ChatGPT in their academic activities. The most prevalent use is for translation from other languages (55%), followed closely by proofreading and editing (51%). Paraphrasing (41%) and research assistance (40%) also rank highly, showcasing the tool's role in refining and generating academic content. Additionally, 27% of students use ChatGPT to generate ideas, and 25% for summarizing texts. A smaller yet significant proportion of students likely employ ChatGPT for tasks specific to their field, such as writing pharmacy reports (25%) or generating specialized content. These findings underscore the tool’s versatility in addressing both general and domain-specific academic needs.

Figure 7



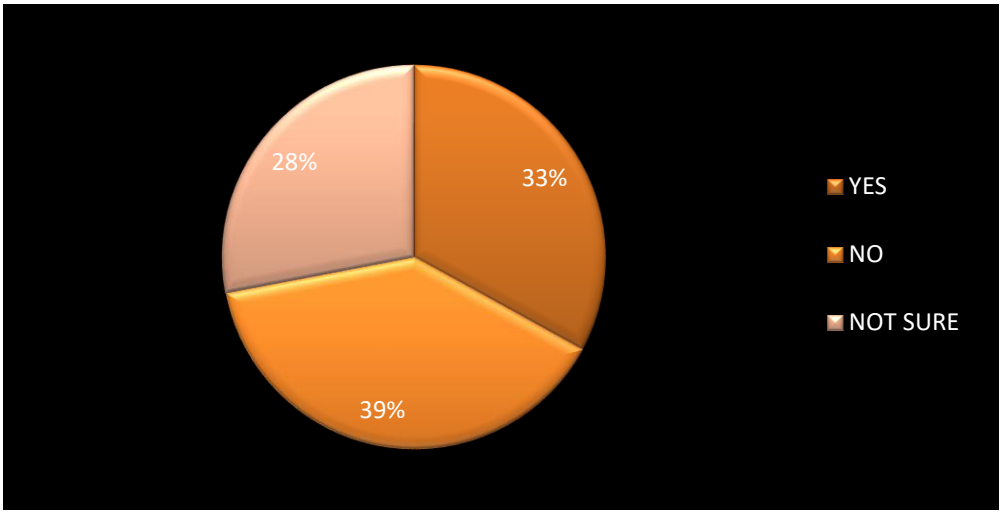
The findings in Figure 7 illustrate the multifaceted benefits of using ChatGPT. A significant proportion of users (61%) appreciate its role in providing quick access to ideas, showcasing its utility as a powerful tool for brainstorming and fostering creativity. Nearly half of the respondents (49%) highlight its effectiveness in language-related tasks, such as improving grammar and finding synonyms, underlining its contribution to enhancing linguistic skills. Additionally, 30% of users report improved efficiency, reflecting ChatGPT's capacity to streamline workflows and save time. Features like paraphrasing (27%) and summarizing (25%) are also valued for tasks involving restructuring or condensing content. Moreover, 21% of users note that ChatGPT enhances writing quality by refining tone, clarity, and coherence.

Figure 8



The results presented in Figure 8 reveal several key challenges faced by students when using ChatGPT. Over-reliance on AI emerged as a significant concern, with 56% of respondents acknowledging this issue. Additionally, 51% of participants found it challenging to verify the accuracy of the information provided by the tool. Ethical concerns were highlighted by 65% of students, underscoring apprehensions about potential misuse and academic integrity. Lastly, 35% of respondents noted the lack of contextual understanding in ChatGPT's responses, pointing to limitations in its ability to provide nuanced and contextually accurate answers. These findings highlight the need for cautious and informed use of AI tools in academic settings.

Figure 9



The results from Figure 9 reveal mixed opinions on the integration of ChatGPT into pharmacy curricula. Approximately 33% of respondents are in favor of incorporating ChatGPT into the curriculum, while 39% are opposed to its inclusion. Additionally, 28% of participants remain uncertain about its potential role in the curriculum. These findings suggest a division of opinion on the matter, highlighting the need for further exploration of its benefits and challenges in academic settings.

Table 1

Suggested improvements	**%**
Tools to facilitate group discussions using AI	20%
Accurate translation from different languages	5%
Guidance on academic integrity	49%
Direct links to credible pharmacy journals	39%
Accurate information on pharmacy products	33%
The ability to analyze real-world pharmacy studies	19%
Improved understanding of pharmacy concepts	55%

The results presented in Table 1 indicate several key areas where participants believe improvements could be made in the integration of AI, specifically ChatGPT, into pharmacy curricula. The most significant suggested improvement, with 55% of respondents, is a better understanding of pharmacy concepts. This highlights the desire for ChatGPT to assist students in grasping complex topics within pharmacy education.

Guidance on academic integrity is also a critical area, with 49% of participants suggesting this as an important enhancement. This points to the need for more structured support to ensure students adhere to ethical standards while using AI tools for academic tasks. Furthermore, 39% of respondents emphasize the importance of direct links to credible pharmaceutical journals, reflecting a desire for ChatGPT to help students access authoritative sources in their studies.

The ability to analyze real-world pharmacy studies was highlighted by 19% of participants, suggesting that ChatGPT could be a useful tool for fostering practical, real-world applications of pharmacy knowledge. However, only 20% of respondents pointed to tools for facilitating group discussions with AI assistance, indicating a relatively lower demand for this feature, though it may still be useful in collaborative learning environments. Additionally, accurate translation from different languages was identified as an improvement by only 5% of respondents, showing that this need is relatively minimal in the context of pharmacy education.

Overall, these results suggest that while there is recognition of the utility of ChatGPT in pharmacy education, improvements are needed in areas such as academic integrity, access to credible resources, and enhancing students' comprehension of pharmacy concepts to maximize its potential.

Conclusion

In conclusion, the findings of this study underscore both the potential and the challenges of integrating ChatGPT into academic writing practices among pharmacy students at the University of Tetovo. The results show that students recognize the utility of ChatGPT in enhancing their academic tasks, particularly in offering quick access to ideas, supporting language-related tasks, and improving efficiency in writing processes. However, the study also reveals several concerns, including over-reliance on AI, difficulty in verifying information accuracy, ethical considerations, and limitations in contextual understanding. These issues highlight the need for appropriate training and guidance for both students and instructors to ensure ChatGPT's responsible and effective use in educational settings.

Furthermore, the survey results indicate that students see value in ChatGPT’s potential to improve their understanding of pharmacy concepts and academic writing quality, but they also suggest key areas for improvement. These include enhancing the tool’s capability to provide more accurate

pharmaceutical information, links to credible journals, and guidance on academic integrity. While ChatGPT's integration into pharmacy curricula is viewed favorably by some, there remains a degree of uncertainty and resistance, which reflects the need for a more tailored approach to its implementation.

Overall, this research contributes to the growing discourse on AI tools in higher education, providing valuable insights into their integration into specialized disciplines like pharmacy. The findings suggest that further research and careful consideration are needed to fully realize the benefits of AI, ensuring it complements traditional educational methods while addressing potential drawbacks.

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