ISSN: 2473-4901
v10 n6185

Exploring Students' Use and Outcomes of ChatGPT

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Abstract

This study explores the experiences and outcomes of students using artificial intelligence (AI) tools like ChatGPT. The qualitative data was gathered through interviews, highlighting three primary outcomes: academic efficiency, enhanced understanding, and knowledge enhancement. Findings reveal that AI tools significantly improve students' efficiency in completing assignments, provide deeper insights into complex topics, and expand their overall knowledge base. Despite some challenges, such as occasional inaccuracies and the necessity for further verification, the overall impact of AI on learning is positive. The study underscores the potential of AI to transform educational practices and support student learning, aligning with existing literature that highlights AI's role in fostering personalized and effective learning environments. This research contributes to the broader discourse on AI in education, suggesting implications for future integration of AI tools in academic settings to maximize their benefits.

Keywords: artificial intelligence, use, outcomes, qualitative coding, Ghana

1. INTRODUCTION

Artificial Intelligence (AI) and natural language processing (NLP) tools are increasingly influencing various sectors, including education. These technologies, exemplified by systems such as ChatGPT, are transforming how students engage with academic work, offering new methods for enhancing learning and productivity. AI's potential to revolutionize educational practices has been widely acknowledged, with numerous studies highlighting its benefits and challenges (Luckin et al., 2016; Holmes et al., 2019).

The use of AI in education covers a wide range of applications, from personalized learning environments to intelligent tutoring systems. AI tools can provide immediate feedback, tailor educational content to individual learning styles, and assist with administrative tasks, thereby freeing educators to focus more on teaching and less on administrative burdens (Holmes et al., 2019). AI tools like ChatGPT have further extended these capabilities by enabling sophisticated text analysis, generating human-like responses, and assisting with complex problem-solving tasks. These advancements are not only enhancing student learning experiences but also supporting educators in delivering more effective instruction (Zawacki-Richter et al., 2019).

Despite these advancements, the integration of AI tools in education raises several concerns. Issues such as student privacy and data protection are widely debated (Huang, 2023). Furthermore, the effectiveness of these tools in diverse educational settings, particularly in under-resourced regions, remains an area of ongoing research and discussion (Santos & Boticario, 2016). Therefore, understanding students' experiences and perceptions of these tools is crucial for developing effective implementation strategies and policies.

This study aims to explore the experiences and perspectives of students regarding the use of AI tools like ChatGPT in their academic work. By examining both students who have used these

tools and those who have not, this research seeks to provide a comprehensive understanding of the factors influencing their adoption and utilization.

This paper has five sections. The first section presents the paper's rationale followed by a review of relevant literature in the second section. The third section contains the methodology used to undertake this study, while the fourth section presents the data and analysis. The fifth discusses this paper's findings vis-à-vis previous studies, and draws conclusions in the sixth section.

2. LITERATURE REVIEW

AI tools have been gaining significant attention in educational research and practice. These technologies are being integrated into various aspects of teaching and learning, offering promising opportunities for personalized education and enhanced student engagement. The current body of literature highlights both the potential benefits and the challenges associated with the adoption of AI and NLP tools in educational settings.

One of the primary advantages of AI in education is its ability to provide personalized learning experiences. AI systems can analyze large datasets to identify individual learning patterns and preferences, allowing for tailored educational content that meets the specific needs of each student. Studies have shown that personalized learning facilitated by AI can lead to improved student performance and engagement (Ouyang, Wu, Zheng, Zhang & Jiao, 2023). For instance, AI-driven platforms like Coursera and Khan Academy use machine learning algorithms to recommend personalized learning paths and resources, enhancing the overall learning experience (Luckin et al., 2016). These adaptive learning systems are particularly beneficial for students who require additional support or those who excel and need more challenging material (Woolf et al., 2013).

AI tools, such as ChatGPT, have also demonstrated significant potential in educational contexts. These tools can assist students with writing tasks, provide instant feedback, and facilitate language learning by generating natural language responses. Research by Chen et al. (2020a) indicates that NLP tools can effectively support second language acquisition by providing interactive and adaptive language practice. Moreover, these tools can help students develop critical thinking and problem-solving skills by engaging them in complex dialogues and discussions (Zhai et al., 2021). The use of AI to provide formative assessment and feedback has been shown to increase students' motivation and confidence in their learning abilities (Wang & Heffernan, 2019).

Despite these advancements, the integration of AI tools in education raises several concerns. One major concern is the ethical implications of using AI in educational settings. Issues such as student privacy, and data protection have been widely debated (Huang, 2023). Ensuring that AI systems are transparent, fair, and accountable is crucial to addressing these ethical concerns. Researchers have called for the development of robust ethical guidelines and policies to govern the use of AI in education (Holmes, Bialik, & Fadel, 2019). For example, there are concerns about the extent to which AI can influence students' autonomy and the potential for surveillance (Selwyn, 2019).

Another significant challenge is the digital divide, which refers to the gap between those who have access to digital technologies and those who do not. In many developing regions, limited access to technology and internet connectivity can hinder the effective implementation of AI tools in education. Studies have highlighted the need for inclusive policies and initiatives to bridge this gap and ensure equitable access to AI-driven educational resources (Santos & Boticario, 2016). Additionally, there is a concern about the preparedness of educators to effectively integrate AI into their teaching practices. Professional development and training are essential to equip educators with the skills and knowledge needed to leverage AI tools effectively (Zawacki-Richter et al., 2019).

The impact of AI on students' cognitive and emotional development is another area of concern. While AI tools can enhance learning efficiency and provide personalised support, there is a risk that over-reliance on these technologies could undermine students' ability to develop critical thinking and problem-solving skills independently (Luckin et al., 2016). Moreover, the potential for AI to replicate and reinforce existing biases in educational content and assessment practices necessitates careful consideration and continuous monitoring (Holmes et al., 2019). For example, research by Angwin et al. (2016) has shown how biases in algorithms can lead to discriminatory outcomes, a risk that needs to be mitigated in educational contexts.

Despite these challenges, the potential of AI tools to transform education remains substantial. Emerging research continues to explore

ISSN: 2473-4901
v10 n6185

innovative applications of these technologies, from intelligent tutoring systems to AI-powered assessment tools. For example, AI-driven assessment platforms can provide real-time feedback and personalized recommendations, helping students to improve their academic performance (Zawacki-Richter et al., 2019). Additionally, AI can support educators by automating administrative tasks, allowing them to focus more on teaching and student interaction (Holmes et al., 2019). AI-driven chatbots are being developed to offer academic advising and support, helping students navigate their educational journey more effectively (Becker et al., 2020).

The role of AI in fostering inclusive education is also being explored. AI tools can be designed to accommodate diverse learning needs, including those of students with disabilities. For instance, AI-powered speech recognition and text-to-speech technologies can assist students with visual or auditory impairments, enabling them to participate more fully in educational activities (Ke & Im, 2013). Similarly, AI-based learning analytics can identify at-risk students early and provide targeted interventions to support their academic success (Siemens & Baker, 2012).

Despite the invaluable insights from the previous studies, there remains a need to explore the experiences and perspectives of students regarding the use of AI tools like ChatGPT in their academic work. Hence, this study.

3. METHODOLOGY

The methodology of this study was designed to explore students' experiences and perceptions of AI such as ChatGPT, in academic work. This qualitative research sought to gain an in-depth understanding of the participants' lived experiences and perspectives (Creswell & Poth, 2018). The study uses structured interviews to collect detailed data from students with and without experience using these tools. However, due to space constraints, only the data from the those with experience will be presented in this paper.

Participants

The participants in this study were students from various academic disciplines at the University of Ghana Business School. A purposive sampling method was used to select participants who could provide rich and diverse insights into the research questions (Palinkas et al., 2015). The sample included both students who have used AI tools and those who have not, ensuring a comprehensive exploration of different perspectives. In total, 62 students responded, which is consistent with the recommendations for qualitative research to achieve data saturation (Guest, Bunce, & Johnson, 2006).

Data Collection

Data were collected using semi-structured interviews, which allow for flexibility in exploring different aspects of the participants' experiences while maintaining a consistent structure across interviews (Kallio et al., 2016). The interview guide (included in this paper's Appendix) and included both open-ended and probing questions to elicit detailed responses. The interviews covered topics such as participants' familiarity with AI, their experiences and outcomes using these tools, and their views on the potential regulation of AI in academic contexts.

The interview guide was pilot tested with a small group of students to refine the questions and ensure clarity (Turner, 2010). Interviews sheet was shared to the students via a Google Form (see: https://forms.gle/Cu7BuhGPg2UuUTi36)

Data Analysis

The study followed Miles et al.'s (2014) for analyzing qualitative data. The first step involved open coding, consisting of breaking and naming interview data into discrete conditions. The main output of this step is first-order codes, which offer descriptive labels for a variety of interview responses. The second step involved axial coding; an inductive, recursive process through which similar first-order codes were combined into a set of more abstract second-order constructs. The third step was selective coding which involved combining similar second-order constructs in to obtain aggregate theoretical dimensions. Tables 1 and 2 illustrates the actual results for the data analysis process.

4. FINDINGS

Use of ChatGPT

The analysis of the selective code "Academic Support" reveals a significant reliance on AI technologies, particularly ChatGPT, as tools that facilitate various academic tasks. Respondents frequently noted using AI for assistance with research-related assignments, indicating its utility in generating outlines, providing logical flow, and summarizing complex materials. The responses highlight the efficacy of AI in streamlining the academic writing process, as many participants reported using it for tasks such as paraphrasing and idea generation, thereby alleviating some of the pressures associated with

ISSN: 2473-4901
v10 n6185

academic work. Furthermore, the experiences shared by users suggest that AI not only aids in the completion of assignments but also enhances understanding of difficult concepts, making learning more accessible and efficient. While the experiences are predominantly positive, some respondents acknowledged challenges, such as occasional inaccuracies in information provided by AI, underscoring the importance of critical evaluation of AI-generated content. Overall, the findings suggest that AI serves as a valuable adjunct in the academic landscape, fostering improved engagement and productivity among students.

The analysis of the selective code "Educational Impact" illustrates the transformative role that AI technologies, such as ChatGPT, play in enhancing learning experiences for users. Respondents frequently highlighted that AI facilitates a deeper understanding of complex subjects, enabling them to pose specific questions and receive tailored responses that align with their educational needs. Many users expressed that the ability to interact with AI is akin to engaging with a knowledgeable peer, which diminishes the intimidation often associated with traditional learning methods. Furthermore, AI has been perceived as a means to simplify intricate topics, thus making information more digestible and comprehensible. The capacity of AI to present information from diverse disciplines has also been noted, indicating its broad applicability in educational contexts. However, while the positive experiences were prevalent, some respondents cautioned that the reliability of AI-generated information can vary, necessitating a discerning approach to its use. Overall, the educational impact of AI is characterized by enhanced accessibility to knowledge, increased motivation for learning, and the provision of a dynamic platform for academic exploration.

The analysis of the selective code "Professional Support" reveals the significant benefits that AI technologies provide in various professional contexts, particularly in administrative and research tasks. Respondents noted that AI tools like ChatGPT assist in streamlining routine professional activities, such as writing emails, cover letters, and generating ideas for projects. This support alleviates some of the pressures associated with administrative responsibilities, allowing individuals to focus on more strategic tasks. Additionally, AI was frequently mentioned as a valuable resource for enhancing research efforts, offering insights and summarizing complex information efficiently. Users appreciated the speed and accuracy of AI-generated responses, which often led to improved productivity and time management. Moreover, the adaptability of AI tools to different professional scenarios was underscored, demonstrating their versatility in assisting with tasks across various sectors. Despite some concerns regarding the accuracy of information, the overall sentiment reflects a growing reliance on AI as a supportive tool that enhances professional capabilities, fosters creativity, and contributes to more effective workflows in diverse occupational settings.

Outcomes of ChatGPT Use

The integration of AI tools like ChatGPT has significantly enhanced academic efficiency for many respondents. Users frequently cited that these tools made their work easier and less time-consuming, effectively reducing the burden of extensive research and enabling quicker completion of tasks. Responses highlighted the role of AI in enhancing work efficiency, where the majority of the preparatory work was already done, allowing users to focus on refining and improving their outputs. The AI tools provided immediate feedback, improving the overall learning outcomes and assisting students in achieving their academic goals more efficiently. The simplicity and ease of use of AI tools were also emphasized, with respondents appreciating how these technologies streamlined their workflow and facilitated easier comprehension of complex topics. The ability to quickly gather relevant information and generate structured responses further contributed to the efficiency of academic tasks, making it possible for users to manage their workload more effectively and maintain a high level of productivity. Overall, the use of AI in academic settings has proven to be a valuable asset in enhancing efficiency, providing timely support, and simplifying the academic process for many individuals.

AI tools like ChatGPT have played a crucial role in enhancing users' understanding of various subjects and concepts. Many respondents expressed that these tools provided clear and concise explanations, making it easier to grasp complex topics. The AI's ability to break down complex information into simpler terms has been particularly beneficial for students and professionals alike, allowing them to achieve a better understanding with less effort. Respondents appreciated the contextual relevance of the responses provided by AI, which often included detailed explanations and additional resources for further reading. This not only facilitated a deeper comprehension but also broadened the users' knowledge base. The AI's

capability to generate ideas, paraphrase content accurately, and offer structured answers contributed significantly to the respondents' learning experiences. Additionally, AI tools have been instrumental in providing immediate clarification on confusing points, thereby enhancing overall learning outcomes. The ability to quickly access reliable and coherent information has made these tools indispensable for those seeking to improve their understanding and knowledge retention. Consequently, the use of AI has led to a more informed and educated user base, capable of navigating complex subjects with greater confidence and ease.

AI tools like ChatGPT have significantly contributed to the enhancement of users' knowledge across various domains. Respondents frequently highlighted how these tools have broadened their understanding and introduced them to new concepts and ideas. The AI's ability to provide relevant, accurate, and detailed information has been instrumental in expanding users' intellectual horizons. Many users mentioned that the AI's responses helped them gain deeper insights into topics they were already familiar with, as well as explore new areas of interest.

The AI's capability to offer diverse perspectives and extensive explanations has enabled users to build a more comprehensive knowledge base. Respondents appreciated the AI's role in providing immediate feedback and clarifications, which facilitated continuous learning and intellectual growth. This instant access to a vast repository of information has been particularly beneficial for research purposes, allowing users to gather and assimilate knowledge more efficiently.

Moreover, the AI's structured and coherent presentation of information has made it easier for users to assimilate and retain new knowledge. This has been especially valuable in academic and professional settings, where the ability to quickly understand and apply new concepts is crucial. By simplifying complex information and presenting it in an accessible manner, AI tools have empowered users to enhance their cognitive abilities and academic performance.

5. DISCUSSION

The outcomes of this study indicate that AI tools like ChatGPT have profoundly impacted users, particularly in three key areas: academic efficiency, enhanced understanding, and knowledge enhancement. These findings align with existing literature on the efficacy of AI in educational and professional settings.

The data reveals that AI tools contributes to academic efficiency by streamlining research processes and providing quick, accurate responses. Users reported that AI tools facilitated the completion of assignments and research tasks more efficiently, allowing them to focus on higher-order cognitive activities. This is consistent with findings from Rahman & Watanobe (2023), who noted that AI applications in education improve productivity by automating routine tasks such as daily practice and support for students learning computer programming. Additionally, the AI's ability to provide structured and coherent information helps users to organize their thoughts and ideas more effectively, leading to better academic outputs. This aligns with the work of Luckin et al. (2016), who highlighted the role of AI in supporting personalized learning and enhancing students' academic performance.

AI tools like ChatGPT have also been instrumental in enhancing users' understanding of complex concepts. Respondents frequently mentioned that the AI's explanations and contextual information helped them grasp difficult topics more easily. This is supported by research from Chen et al. (2020), which found that AI-driven educational tools enhance comprehension by providing personalized and adaptive learning experiences. Furthermore, the ability of AI to simplify and break down complex information into manageable chunks aligns with Mayer's (2002) Cognitive Theory of Multimedia Learning, which emphasizes the importance of presenting information in a way that aligns with human cognitive processes. The AI's role in providing immediate feedback and additional resources further aids in deepening users' understanding, fostering a more interactive and engaging learning experience.

The use of AI tools has significantly contributed to the enhancement of users' knowledge across various domains. Many respondents highlighted how these tools introduced them to new concepts and broadened their intellectual horizons. This finding is in line with research by Boulton (2017), which demonstrated that AI tools are effective in facilitating knowledge acquisition and continuous learning. The AI's ability to provide diverse perspectives and extensive explanations enables users to build a more comprehensive knowledge base, supporting the notion that AI can serve as a valuable educational companion (Holmes et al., 2019). Additionally, the structured and coherent presentation of information by AI tools aids in the retention and assimilation of new knowledge, as suggested by the Dual Coding Theory (Paivio, 1986), which posits that information presented in

ISSN: 2473-4901
v10 n6185

both verbal and visual formats enhances learning and memory retention.

6. CONCLUSION

The integration of AI tools like ChatGPT into academic and professional practices has yielded significant benefits, particularly in enhancing academic efficiency, understanding, and knowledge acquisition. These tools not only streamline routine tasks but also facilitate deeper comprehension and continuous learning. Future research should explore the long-term impact of AI on educational outcomes and its potential to further personalize learning experiences. The findings of this study underscore the transformative potential of AI in education and professional development, highlighting the need for continued innovation and integration of AI technologies in these fields.

One limitation of this study is the use of purposive sampling, which, while useful for targeting individuals with specific experiences or characteristics relevant to the research, inherently introduces bias. The results about participants who have used AI tools like ChatGPT, reflect only a subset of students who are more technologically inclined or already familiar with such tools. This limits the diversity of perspectives and experiences, as students who may be less familiar or more resistant to AI are not represented. Consequently, the findings may not fully capture the range of student experiences, particularly those of individuals who either have not used or have had limited exposure to AI technologies

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Selective codes, axial codes, and open codes	Illustrative Responses
Selective code: Academic Support 1. Uses AI for definitions and guidance a. Definitions and Guidance	I use it sometimes in place of a simple Google search for definitions. Sometimes I use it as a guide. The experience is generally good though on some few occasions, it has returned wrong data. For research-based assignments especially to aid the outline and logical flow.
2. Problem-Solving b. Quick problem-solving support	AI has provided some good support to me. I have used it to get answers to problems quickly and also as a guide to solving problems although it comes with some inherent challenges.
c. Academic problem-solving	Is up to tasks and helps me solve my academic problems.
d. Research assistance for complex questions	I use it for research of answers to complicated questions.
3. Writing Assistance e. Paraphrasing utility	Used it as a paraphrasing tool.
f. Writing aid	For writing.
g. Framework development	It's quite useful; I used it for mostly frameworks for my academic work.
4. Research Support h. Research tool	For research.
i. Research assistance	It was and has been an excellent experience in assisting during research work and seeking other information.
Selective code: Educational Impact 1. Learning Facilitation j. Simplifies learning	AI is an evolving technology that brings information and learning closer to me. It helps me to understand things in the simplest manner.
k. Learning support	For Learning.
	It's a good learning tool that helps you go about what you are looking for. I use it for learning and doing research works.
l. Conceptual understanding	It was useful in getting the understanding of some concepts.
m. Complexity simplification	It's been helpful. I use it to understand complex things.
n. Summarization utility	Very helpful for summarizing.
2. Information Management o. Definition retrieval	AI has been very helpful to me; I mostly use it for getting definitions to words.
p. Simplifies complex queries	I use the AI to search for works that Google gives me complicated answers on.
q. Enhances understanding	I use AI for better understanding in whichever way.
Selective code: Professional Support r. Document generation	I used it to write a cover letter. The response was quick and almost accurate. I only made a few changes.
s. Administrative assistance	AI was helpful in writing emails and letters whilst doing my administrative work.
t. Organizational task assistance	enabled me to perform an organizational task.
u. Immediate assistance	AI has helped me with immediate assignments and quick information.
v. Business information retrieval	It saves time; I used it to get more information about my business and shared it with my clients.

Table 1: Codes and Qualitative Data on Students Use of AI Use in Academic Work

Selective codes, axial codes, and open codes	Illustrative Interview Responses
Selective code: Academic Efficiency	
1. Work Efficiency	
a. Work Enhancement	Because majority of the work had been done already, the work of the AI was an enhancing one
b. Reduced workload	Made work easier, eased burden improved knowledge in the field I was searching on
	It made my work much easier
c. Time Efficiency	Informative, helpful and less time-consuming
2. Learning Outcomes	
d. Learning Improvement	It has helped improve learning outcomes. I have also had immediate feedback regarding my academic work.
Selective code: Enhanced Understanding	
3. Clarity and Understanding	
e. Structured Responses	It gives distinct structuring of answers and explanation although it doesn't tell why those explanations come about.
f. Simplification	I use it to explain questions I don't understand and also to simplify or explain concepts I don't understand. It always gives answers that are easy to understand.
g. Relevant Information access	Very good. Most of the information I got was relevant to me and also accurate as I had knowledge of the concept I was looking at.
Selective code: Knowledge Enhancement	
4. Extended knowledge	
h. Knowledge Broadening	I will say it is perfect since it broadens my knowledge in understanding things. On the other hand, it sometimes narrows me from reading more articles and books to enhance my vocabulary and reading skills because it gives me a short way of understanding things.
5. Accuracy Issues	It sometimes gives out wrong info but most accurate answers
i. Mixed Accuracy	I realized it gave me wrong answers some time ago
j. Accuracy Issues	Not always accurate so it requires further research

Table 2: Codes and Qualitative Data on Outcomes of AI Use in Academic Work

ISSN: 2473-4901
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7. REFERENCES

Angwin, J., Larson, J., Mattu, S., & Kirchner, L. (2016). Machine bias. ProPublica. Retrieved from https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Becker, S., Cummins, M., Davis, A., Freeman, A., Hall Giesinger, C., & Ananthanarayanan, V. (2020). NMC Horizon report: 2018 higher education edition. EDUCAUSE.

Boulton, H. (2017). Integrating AI in education: The future of learning. Educational Technology, 57(3), 45-54.

Chen, C., Xie, H., Zhang, Y., & Hao, T. (2020). The effects of artificial intelligence tutoring systems on students' learning outcomes: A meta-analysis. Journal of Educational Technology & Society, 23(2), 1-9.

Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Sage Publications.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18(1), 59-82. https://doi.org/10.1177/1525822X05279903

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.

Huang, L. (2023). Ethics of Artificial Intelligence in Education: Student Privacy and Data Protection, Science Insights Education Frontiers, 16(2), 2577–2587. https://doi.org/10.15354/sief.23.re202

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. Journal of Advanced Nursing, 72(12), 2954-2965. https://doi.org/10.1111/jan.13031

Ke, F., & Im, T. (2013). Adaptive learning technologies: Applications and issues. In M. Spector, D. Merrill, J. Elen, & M. Bishop (Eds.), Handbook of Research on Educational Communications and Technology (pp. 783-795). Springer.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson Education.

Mayer, R. E. (2002). Multimedia Learning. Cambridge University Press. https://doi.org/10.1016/S0079-7421(02)80005-6

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative Data Analysis: A Methods Sourcebook (3rd ed.). Thousand Oaks: SAGE Publications.

Ouyang, F., Wu, M., Zheng, L., Zhang, L. & Jiao, P. (2023). Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course, *International Journal of Educational Technology in Higher Education*, 20(4) https://doi.org/10.1186/s41239-022-00372-4

Paivio, A. (1986). Mental Representations: A Dual Coding Approach. Oxford University Press.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and Policy in Mental Health and Mental Health Services Research, 42(5), 533-544. https://doi.org/10.1007/s10488-013-0528-y

Rahman, M.M.; Watanobe, Y. (2023). ChatGPT for Education and Research: Opportunities, Threats, and Strategies. *Applied Sciences*, *13*, 5783. https://doi.org/10.3390/app13095783

Santos, O. C., & Boticario, J. G. (2016). Educational recommender systems and technologies: Practices and challenges. Springer.

Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. British Journal of Educational Technology, 50(6), 1235-1248.

Siemens, G., & Baker, R. S. (2012). Learning analytics and educational data mining: Towards communication and collaboration. In S. Buckingham Shum, D. Gašević, & R. Ferguson (Eds.), Proceedings of the 2nd International Conference on Learning Analytics and Knowledge (pp. 252-254). ACM. https://doi.org/10.1145/2330601.2330661

Turner, D. W. (2010). Qualitative interview design: A practical guide for novice

ISSN: 2473-4901
v10 n6185

investigators. The Qualitative Report, 15(3), 754-760.

Wang, Y., & Heffernan, N. T. (2019). The impact of immediate feedback on students' learning gains in an intelligent tutoring system. In V. Aleven, K. R. Koedinger, & C. K. Rollinger (Eds.), Artificial Intelligence in Education (pp. 198-204). Springer.

Woolf, B. P., Lane, H. C., Chaudhri, V. K., & Kolodner, J. (2013). AI grand challenges for education. AI Magazine, 34(4), 66-84. https://doi.org/10.1609/aimag.v34i4.2490

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators?. International Journal of Educational Technology in Higher Education, 16(1), 39. https://doi.org/10.1186/s41239-019-0171-0

Zhai, X., Chu, X., & Chen, H. (2021). AI in Education: An Overview of the Current Status and Future Trends. International Journal of Educational Technology in Higher Education, 18(1), 1-20.

Appendix

Interview Guide

Introduction
This interview guide is designed to explore your experiences, challenges, and opinions regarding the integration of ChatGPT into your academic endeavors:

Demographics
1. What is your first name?
2. What is your gender?
3. Do you have any experience with AI or natural language processing tools like ChatGPT?

Students with Experience
4. Describe your experiences with AI or natural language processing tools and what you used it for.
5. How have you used AI or natural language processing tools like ChatGPT for academic work?
6. What was the outcome of using AI or natural language processing tools like ChatGPT for academic work?
7. Do you intend to use AI or natural language processing tools like ChatGPT for academic work in future? Why or why not?
8. If academic use of AI or natural language processing tools like ChatGPT is to be regulated, what would you like to see in in a policy document?

Students without Experience
4. Why have you not used AI or natural language processing tools like ChatGPT?
5. What have you heard or know about AI or natural language processing tools like ChatGPT?
6. Based on what you have you heard or know about AI or natural language processing tools like ChatGPT, how likely are you to use it in future?
7. Describe the factors that would make you use AI or natural language processing tools like ChatGPT in future.
8. Specifically, what would make you use AI or natural language processing tools like ChatGPT for academic work in future?
9. If academic use of AI or natural language processing tools like ChatGPT is to be regulated, what would you like to see in in a policy document?