

Student Adoption Toward New Generative AI: A Special Reference to Learning Platform

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ABSTRACT

Generative artificial intelligence (AI) is revolutionizing education by providing tools that can personalize learning, deliver adaptive feedback, and create innovative educational content. As educational institutions integrate these technologies, understanding student adoption becomes vital. Factors such as awareness, perceived usefulness, ease of integration, technical support, user experience, and institutional backing influence how students embrace and utilize generative AI tools. The impact on learning outcomes is significant, with these tools enhancing personalized learning, boosting engagement, and improving academic performance. However, challenges related to usability, technical issues, and ethical considerations must be addressed. Effective support and feedback mechanisms are crucial for optimizing the benefits of generative AI in education.

Keywords: Generative AI, Student Adoption, Learning Outcomes.

I. Introduction

In the rapidly evolving landscape of education, generative artificial intelligence (AI) has emerged as a transformative tool with the potential to reshape learning environments and enhance student experiences. As educational institutions increasingly integrate AI technologies into their platforms, understanding student adoption of these tools becomes crucial. Generative AI, which includes technologies that create new content or responses based on input data, offers unprecedented opportunities for personalized learning, adaptive feedback, and innovative educational content. However, the extent to which students embrace and effectively utilize these technologies is influenced by various factors including their awareness, perceived usefulness, and ease of integration into existing learning practices. Students' interaction with generative AI tools can significantly impact their learning outcomes, engagement levels, and overall academic performance. This interaction is not only shaped by the tools' capabilities but also by students' attitudes and the support provided by educational institutions. Addressing the challenges related to usability, ethical considerations, and data privacy is essential for maximizing the benefits of generative AI in education (**Chan, 2023**). Furthermore, exploring student feedback on these tools can offer valuable insights into their practical applications and areas for improvement. As we delve into the specifics of student adoption toward generative AI, it is important to consider how these tools align with educational goals and how they can be optimized to meet the diverse needs of learners. By examining these factors, we can gain a deeper understanding of how generative AI can enhance educational experiences and outcomes, paving the way for more effective and engaging learning platforms in the future (**Chen, 2020**).

II. Review of Literature

Dai, et al. (2020) designed and validated an instrument to measure students' preparedness for learning about artificial intelligence (AI). The research involved implementing an AI course in a Beijing school district and surveying students to identify factors influencing their readiness. The findings revealed that AI literacy was not a reliable predictor of AI preparedness. Instead, students' self-confidence and perceived importance of AI were key mediators. Male students reported higher self-assurance and preparedness compared to females. Despite these differences, students generally viewed AI positively, and the validated survey provided insights for refining AI curricula.

Cantú-Ortiz, et al. (2020) presented a case study on preparing students for Industry 4.0, focusing on AI in education. The research proposed a method for reviewing AI curricula to meet Industry 4.0 challenges, emphasizing intelligent human-computer interaction. The introduction of the Tec21 Educative Model, with challenge-based learning and blended teaching, aimed to align courses with Industry 4.0 needs. The study's findings provided valuable insights for institutions developing AI programs to address modern industry demands.

Malik, et al. (2021) investigated the use of chatbots by college students for educational purposes, a less-explored area in educational research. The study utilized path analysis to validate new variables in the Technology Adoption Model, identifying factors influencing chatbot adoption. The findings were significant for improving learning efficiency through chatbots, with implications for researchers, educators, policymakers, and system designers. The study highlighted the potential of chatbots to enhance educational outcomes, calling for more research on their use in educational settings to fully harness their benefits.

Alam, A. (2021) explored the application and impact of AI in administration, education, and learning, using a narrative framework and qualitative methods. The research highlighted AI's extensive adoption across various contexts, particularly in education. The study noted the use of embedded systems, humanoid robots, and chatbots in instructional tasks, showcasing AI's evolution from basic technology to advanced educational platforms. The findings suggested that AI significantly enhances instructional quality and efficiency, with systems adaptable to individual student needs, thereby improving learning experiences and information retention in educational settings.

Lin, et al. (2022) investigated the implementation of AI in education, focusing on AI-enabled e-learning products. Using the unified theory of acceptance and use of technology, the study modelled users' willingness to continuously use these products in China. The research provided insights into user experiences and made recommendations for improving the design and marketing of AI-enabled e-learning products. The study emphasized aligning product development with user requirements to enhance satisfaction and adoption, proposing strategies for sustainable development and optimization of AI-enabled education methods to better meet user expectations.

Ganeshan, M. K., & Vethirajan, C. (2022) reviewed the evolution and impact of e-learning in modern education, noting its growing significance due to increased internet proficiency and bandwidth. The study highlighted the adoption of e-learning tools by educational institutions, facilitating skill and knowledge development through interactive platforms like live and video conferencing. The study projected significant growth in e-learning users and investments, emphasizing its fundamental role in transforming educational methodologies.

Wang et al. (2023) investigated the role of AI in transforming educational practices, revealing limited understanding of its current impact on student participation in intelligent instruction. The study employed a confirmatory model and PLS-SEM software, identifying factors such as satisfaction, university support, perceived enjoyment, and interactive rewards that indirectly influenced participation in AI-driven instruction. The findings highlighted the need for student-oriented approaches and emerging technologies to improve engagement in AI-based education, proposing strategies to create a diverse and high-quality educational system that fully leverages AI's potential.

Cheng, E. C. K., & Wang, T. (2023) examined the integration of AI in elementary and secondary education, focusing on digital leadership's role in overcoming barriers faced by educators. The study developed a conceptual framework for learning from, about, and with AI. Data from a survey of school principals and management-level teachers in Hong Kong underscored the importance of digital leadership for successful AI integration. The research suggested addressing internal and external challenges to enhance AI competencies in education, emphasizing digital leadership as crucial for facilitating AI adoption and improving educational outcomes.

Ma, S., & Lei, L. (2024) explored factors influencing the adoption of AI technologies among students in teacher education programs using the Technology Acceptance Model (TAM). The study incorporated additional elements like AI Literacy (AIL), Subjective Norms (SN), and Output Quality (OQ) to assess their impact on students' readiness to adopt AI. The findings confirmed the TAM's relevance, highlighting Perceived Usefulness (PU) and AIL as key factors influencing Behavioural Intention (BI) to use AI. The study emphasized the importance of demonstrating AI's practical advantages to promote wider adoption in digitalized education.

Ayanwale, et.al., (2024) emphasized the importance of evaluating AI literacy among pre-service teachers amidst global AI integration. Their research, using structural equation modelling (SEM), explored AI literacy among 529 pre-service teachers at a Nigerian university. The findings indicated that AI literacy strongly predicted positive outcomes in AI usage, ethics, and problem-solving, though no significant correlation was found with emotional regulation. The study highlighted ethical concerns related to AI's emotive aspects and emphasized the importance of AI knowledge in shaping literacy among pre-service teachers, offering insights for enhancing AI literacy in teacher education programs.

III. Transformative Potential

Personalized Learning: Generative AI enables tailored educational experiences by adapting content to individual learning styles and needs. This customization allows for more effective teaching strategies, addressing students' unique strengths and weaknesses, and facilitating deeper understanding and retention of material.

Adaptive Feedback: AI tools provide real-time, customized feedback on students' work, helping them identify areas for improvement promptly. This immediate response fosters a more interactive learning process, allowing students to make adjustments and enhance their performance continuously.

Innovative Content Creation: Generative AI can produce diverse and engaging educational materials, including interactive simulations, practice exercises, and multimedia resources. This variety helps keep students engaged and supports different learning modalities, enriching the overall educational experience.

Enhanced Collaboration: AI-driven platforms can facilitate collaborative learning by connecting students with peers, mentors, and resources. These tools enable group projects, discussions, and peer reviews, promoting teamwork and collective problem-solving in a virtual environment.

Scalable Education: Generative AI makes it possible to deliver high-quality education to a large number of students simultaneously. By automating content generation and assessment, educational institutions can scale their offerings without compromising the quality of education provided (*Eftekhari, 2021*).

IV. Student Adoption

Awareness Levels: Students' familiarity with generative AI tools significantly affects adoption rates. Increased awareness through education and outreach can enhance their willingness to use these technologies and integrate them into their learning routines effectively.

Perceived Usefulness: Students are more likely to adopt generative AI if they believe it adds value to their learning process. Tools that demonstrate clear benefits, such as improved understanding or better grades, are more likely to gain acceptance.

Ease of Integration: The ease with which generative AI tools can be incorporated into existing educational practices influences adoption. Tools that seamlessly fit into students' current workflows and study habits are more readily embraced and used consistently.

Technical Support: Adequate technical support is crucial for student adoption. Providing guidance and assistance helps students overcome initial challenges and ensures they can use generative AI tools effectively, leading to greater acceptance and reliance on these technologies.

User Experience: A positive user experience with generative AI tools can drive higher adoption rates. Tools that are user-friendly, intuitive, and engaging encourage students to explore and utilize them more frequently in their studies.

Institutional Support: Institutional backing and encouragement play a significant role in student adoption. When educational institutions actively promote and support the use of generative AI, students are more likely to engage with and benefit from these tools (*Kong, 2022*).

V. Influencing Factors

The adoption of generative AI tools by students is influenced by several critical factors that shape their effectiveness and integration into educational settings. First, awareness is fundamental; students must be knowledgeable about the capabilities and benefits of generative AI to consider its use in their learning processes. This awareness is often cultivated through targeted educational initiatives and demonstrations. Second, the perceived usefulness of AI tools significantly impacts adoption rates. Students are more likely to embrace these technologies if they clearly see how they can enhance their learning outcomes, improve grades, or streamline study habits. Third, the ease of integration plays a crucial role; generative AI tools that seamlessly integrate with existing learning platforms and workflows are more readily adopted. Complicated tools or those requiring significant changes in study routines may face resistance. Fourth, technical support is essential for smooth adoption. Adequate assistance helps students navigate any challenges or technical issues they encounter, ensuring they can utilize AI tools effectively and gain confidence in their use. Fifth, the overall user experiences influence adoption; tools that are user-friendly, intuitive, and engaging encourage more frequent use and exploration by students. (*Liu, 2022*).

VI. Impact on Learning Outcomes

Generative AI tools can have a profound impact on learning outcomes by providing personalized educational experiences that cater to individual student needs. These tools offer tailored content and feedback, adapting in real-time to students' progress and learning styles. This personalization enhances understanding and retention of material, as students receive targeted support that addresses their specific strengths and weaknesses. For instance, AI-driven platforms can generate practice problems or explanations based on a student's performance, facilitating a more effective and engaging learning process. By aligning educational resources with each student's unique requirements, generative AI promotes deeper learning and improved academic performance. Moreover, the interactive nature of generative AI tools can significantly boost student engagement and motivation. When students interact with AI-driven simulations, multimedia resources, or gamified learning experiences, they are more likely to remain invested in their studies. This increased engagement often leads to better learning outcomes as students are more actively involved in their education. Additionally, real-time feedback provided by AI tools helps students promptly address misunderstandings and refine their skills, leading to continuous improvement. Overall, the integration of generative AI into education can enhance both the quality and effectiveness of learning, resulting in more successful and motivated students (*Schroeder, 2022*).

VII. Challenges and Feedback

Usability and Technical Issues: One significant challenge in the adoption of generative AI tools is ensuring their usability and addressing technical issues. Students may encounter difficulties in navigating complex interfaces or experience technical glitches, which can hinder their ability to effectively use these tools. Providing robust technical support and designing intuitive, user-friendly systems are essential to overcoming these obstacles and ensuring a smooth user experience.

Ethical and Privacy Concerns: Another challenge involves managing ethical and privacy concerns related to the use of generative AI in education. Students and educators must address issues such as data security, consent, and the ethical use of AI-generated content. Gathering and incorporating feedback from students on these concerns is crucial for developing policies that protect their privacy while ensuring the responsible use of AI technologies in learning environments (*Chan, 2023*).

VIII. Conclusion

Generative AI represents a transformative advancement in education, offering opportunities for personalized learning and innovative content creation. Its adoption by students hinges on factors such as awareness, perceived usefulness, and ease of integration, which are critical for maximizing its potential benefits. The tools' ability to provide real-time, customized feedback and enhance engagement can significantly improve learning outcomes. However, addressing challenges related to usability, technical support, and ethical considerations is essential for ensuring that these technologies are used effectively and responsibly. By focusing on these aspects and incorporating student feedback, educational institutions can better integrate generative AI into their curricula, paving the way for more effective and engaging learning experiences.

IX. References

1. **Dai, Y., Chai, C. S., Lin, P. Y., Jong, M. S. Y., Guo, Y., & Qin, J. (2020).** Promoting students' well-being by developing their readiness for the artificial intelligence age. *Sustainability*, 12(16), 6597.
2. **Cantú-Ortiz, F. J., Galeano Sánchez, N., Garrido, L., Terashima-Marin, H., & Brena, R. F. (2020).** An artificial intelligence educational strategy for the digital transformation. *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 14, 1195-1209.
3. **Malik, R., Shrama, A., Trivedi, S., & Mishra, R. (2021).** Adoption of chatbots for learning among university students: Role of perceived convenience and enhanced performance. *International Journal of Emerging Technologies in Learning (iJET)*, 16(18), 200-212.
4. **Alam, A. (2021, December).** Should robots replace teachers? Mobilisation of AI and learning analytics in education. In *2021 International Conference on Advances in Computing, Communication, and Control (ICAC3)* (pp. 1-12). IEEE.
5. **Lin, H. C., Ho, C. F., & Yang, H. (2022).** Understanding adoption of artificial intelligence-enabled language e-learning system: An empirical study of UTAUT model. *International Journal of Mobile Learning and Organisation*, 16(1), 74-94.
6. **Ganeshan, M. K., & Vethirajan, C. (2022).** The Impact of E-Learning Technology for Future Generation in Educational Sector. *Asian Journal of Electrical Sciences*, 11(1), 29-32.
7. **Wang, S., Wang, H., Jiang, Y., Li, P., & Yang, W. (2023).** Understanding students' participation of intelligent teaching: an empirical study considering artificial intelligence usefulness, interactive reward, satisfaction, university support and enjoyment. *Interactive Learning Environments*, 31(9), 5633-5649.
8. **Cheng, E. C. K., & Wang, T. (2023).** Leading digital transformation and eliminating barriers for teachers to incorporate artificial intelligence in basic education in Hong Kong. *Computers and Education: Artificial Intelligence*, 5, 100171.
9. **Ma, S., & Lei, L. (2024).** The factors influencing teacher education students' willingness to adopt artificial intelligence technology for information-based teaching. *Asia Pacific Journal of Education*, 44(1), 94-111.
10. **Ayanwale, M. A., Adelana, O. P., Molefi, R. R., Adeeko, O., & Ishola, A. M. (2024).** Examining artificial intelligence literacy among pre-service teachers for future classrooms. *Computers and Education Open*, 6, 100179.