

An Overview of The Use of Artificial Intelligence (AI) Tools in Higher Education

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Abstract: *The integration of Artificial Intelligence (AI) tools in higher education has the potential to revolutionize teaching and learning. However, there is a lack of pedagogical integration when using these tools, which hinders their full potential. This paper provides an overview of the research on AI applications in higher education and highlights the challenges of using AI in the classroom. The study will also look at the ethical issues that occur when using artificial intelligence in higher education, as well as the benefits of this technology and how it impacts student- teacher interaction in online learning environments. The impact of AI on student-teacher interaction in online learning environments is also observed. AI systems have the potential to affect the way student-teacher interaction occurs, but there can be barriers to the effective use of AI systems due to students' unrealistic expectations and misunderstandings about AI. More research and exploration are needed to fully understand the potential and consequences of AI in educational settings. In conclusion, it is crucial to carefully weigh the benefits and challenges of incorporating AI tools into the education system. It is important to note that AI should be used as a tool*

to enhance education and support teachers, rather than replacing human educators. Further research, teacher training, and fostering AI literacy are necessary to fully harness the potential of AI in education and create meaningful learning experiences for students.

Keywords: *Artificial Intelligence, AI Challenges, Higher Education, Online Learning*

1. INTRODUCTION

According to McFarland (2023), Artificial intelligence (AI) tools have become a part of our daily lives, but there is a lack of pedagogical integration, which prevents them from reaching their full potential in education. He also mentioned that to enhance instruction, teachers need to develop approaches or methods that will engage students and make them appreciate the concept of AI. DitchThatTxbk (2023) backed up this claim in his article by pointing out that using traditional classroom teaching methods can be uninspiring and boring for students, but incorporating AI tools into supplemental instructional materials can catch their attention and help them learn about and understand the fascinating tools.

By examining the uses of AI in education and the challenges it encounters, people may better comprehend the scenario concerning AI and education. As a result, instructors' teaching quality and students' learning techniques will improve, and students' learning methods will become more diversified and personalized. This will also enable teachers and students to interact with, and employ AI technology in the teaching and learning process. (Huang et al., 2021).

Through a process called "pedagogical integration," which entails integrating a variety of abilities and skills rather than just juxtaposing them, multiple teaching tactics, technologies, and approaches are merged to make learning more effective and enjoyable for students. (Peyser et al., 2006b). According to Ponterio (n.d.), to increase the effectiveness of education, pedagogical integration is the process of integrating different teaching tactics, approaches, and methodologies into the curriculum and learning experiences. It entails smoothly integrating many instructional strategies, technological tools, and educational philosophies to give students a cohesive and comprehensive learning environment.

The purpose of pedagogical integration is to develop a more comprehensive and interesting educational experience that accommodates students' various requirements and learning preferences. (Peyser et al., 2006b). It can involve combining traditional teaching methods with modern technology, real-world applications, experiential learning, collaborative activities, and more. The aim is to promote deeper understanding, critical thinking, problem-solving skills, and overall knowledge retention among students. Teachers must frequently be adaptable and eager to try out new teaching techniques to implement pedagogical integration. (Instruction, n.d.).

It emphasizes the idea that no single method of instruction is effective in all situations and that the best outcomes are typically attained when instructional strategies are customized to the subject matter, student body, and learning objectives. Through the combination of many teaching tactics, approaches, and technologies, pedagogical integration aims to enhance learning results. It is a flexible and dynamic method of teaching.

It aims to create a more engaging and effective learning environment for students, catering to their diverse needs and learning styles. The primary objective of this research is to identify AI tools and their functions in higher education, while the secondary objective is to examine the challenges associated with the integration of these AI tools in the higher education sector. Through a systematic review, the study seeks to give a general overview of research on AI applications in higher education. The study will look at the challenges and ethical issues that occur when using artificial intelligence in higher education, as well as the benefits of this technology and how it impacts student-teacher interaction in online learning environments.

2. ARTIFICIAL INTELLIGENCE IN EDUCATION

In nearly every field, artificial intelligence (AI) has changed the game, and education is no exception. In recent years, AI has made impressive achievements in transforming the educational landscape, from individualized learning experiences to administrative effectiveness. AI has the potential to revolutionize education by enhancing student learning, enhancing assessment techniques, and assisting teachers in their instructional practices. However, to ensure that AI is used in education responsibly and effectively, a serious study of the ethical and practical consequences is required. Kuo

(2020), in his studies, identified that a number of changes are brought about in the field of education as a result of the application of image recognition, face recognition, adaptive learning, and other artificial intelligence (AI) technologies, which also increase the productivity of teachers.

Online learning and teaching are effectively supported by AI systems, which can also automate routine tasks for instructors and personalize learning for students (Seo et al., 2021). Their research also found that AI-powered assessments have the potential to speed up the communication of grades between students and the instructor and to support both parties by continuously providing feedback on how students are learning and their progress towards their learning objectives.

According to Kumar (2023), AI technologies can be developed and used to meet students' learning requirements because many students need to be trained on how to learn and enhance their lifetime learning skills. With the development of technology, artificial intelligence (AI) will probably play a bigger role in developing immersive virtual learning environments, anticipating students' learning requirements, and promoting collaborative learning experiences.

3. ARTIFICIAL INTELLIGENCE TOOLS AND ITS FUNCTIONS

AI is a technology that enables machines to carry out tasks that ordinarily demand human intelligence. Automation, pattern recognition, problem-solving, and the improvement of learning and reasoning are all capabilities of AI tools. AI tools are like smart helpers for computers. They can do things like learn from data, understand language, and even see and recognize objects. These tools help us make better decisions, work faster, and solve problems. The use of AI tools is revolutionizing many

aspects of human activity. In this discussion, we will look at some of the examples of AI tools available and what they can do to improve and enliven our daily lives.

3.1 PERPLEXITY AI

Perplexity AI is an AI-powered search engine and chatbot that utilizes advanced technologies such as natural language processing (NLP) and machine learning to provide accurate and comprehensive answers to user queries. Perplexity AI is specifically engineered as a multifunctional tool, encompassing both a search engine and a chatbot, wherein its user interface is primarily oriented towards the provision of search outcomes and the presentation of information derived from credible and trustworthy sources. The primary objective of this system is to facilitate users in easily and expeditiously locating relevant information. In contrast to conventional search engines, Perplexity AI provides a user interface like a chatbot, enabling users to pose queries using natural language. The system exhibits a response mechanism that involves referencing pertinent data and authoritative sources received from several online platforms.

3.2 CHATGPT

ChatGPT is an AI-powered chatbot that uses natural language processing (NLP) and machine learning to generate human-like responses to user queries. ChatGPT is derived from the GPT architecture, which was originally developed by OpenAI. The architectural design of this model incorporates deep learning techniques and leverages unsupervised learning methods to generate textual content. ChatGPT exhibits the ability to produce responses that closely resemble those generated by humans when presented with user inquiries. Consequently, it finds utility in a diverse array of domains, encompassing customer service, personal assistance, and numerous other applications (Mhlanga, 2023).

3.3 QUILLBOT

QuillBot is an artificial intelligence (AI)-based writing tool that leverages natural language processing (NLP) and machine learning techniques to aid users in enhancing their writing skills. The purpose of this tool is to assist users in paraphrasing and rephrasing content in order to enhance its readability and engagement. The findings demonstrate that QuillBot's

paraphrasing tools employ a variety of techniques to rewrite the text, including using equations or synonyms, changing the word's form, using active or passive sentences, and rearranging the words in sentences (Fitria, 2021).

3.4 YIPPITY

Yippity is an artificial intelligence (AI) programme that facilitates the conversion of notes and websites into quizzes while also automatically generating flashcards. The programme provides users with the capability to conveniently duplicate and transfer the produced flashcards into an application or engage in direct study through the website. Enhance learning efficiency and optimize study strategies through the use of Yippity.

4. BENEFITS OF APPLYING ARTIFICIAL INTELLIGENCE (AI) TOOLS

Artificial Intelligence (AI) tools are transforming higher education by offering numerous advantages. These tools enhance learning experiences, streamline administrative tasks, and provide personalized support to students and educators alike. Generative AI tools are powerful software or systems that can help teachers and students generate creative content in various domains, such as text, images, audio, video, and more. In this brief overview, we will discuss the benefits of incorporating AI into higher education and show how it is changing the environment for teaching, research, and student achievement.

4.1 PERSONALISED LEARNING

Students can receive individualized instruction and feedback via AI tools based on their unique learning requirements and development (Baidoo-Anu & Ansah, 2023). In order to generate individualized learning plans with material, exercises, and assessments catered to each student's needs, AI tools can be used to support personalized learning by analyzing students' language patterns, feedback, and performance. Improved student outcomes can often be attained through personalized learning (Fuchs, 2023). The study demonstrated that the conversational agent was capable of tailoring its explanations to students' assumptions and adapting to their level of comprehension.

4.2 ADAPTIVE LEARNING

AI tools can be used to develop adaptive learning systems that modify their instructional approaches in response to a student's development and performance. According to a study by Baidoo- Anu and Ansah (2023), a generative adaptive learning system can support students' learning programming more effectively, leading to better performance on programming tests. According to the study, the model could recognize students' prior knowledge and modify the difficulty of the challenges it produced accordingly. Through the provision of individualized learning experiences catered to each student's unique needs and talents, this method aims to aid students in learning more quickly and effectively (Zhai, 2022).

4.3 ENHANCE STUDENTS' LEARNING EXPERIENCE.

According to Chan and Hu (2023), one of the benefits of AI tools in Higher Education is to enhance the student's learning experience through the ability to generate highly original output based on user prompts. Hence, AI tools are widely regarded as valuable research aids that facilitate idea generation, knowledge synthesis, and text summarization. These tools are particularly beneficial for researchers as they assist in data analysis and the composition of written work (Berg, 2023).

5. CHALLENGES OF ARTIFICIAL INTELLIGENCE (AI) TOOLS APPLICATION

Although using artificial intelligence (AI) tools in higher education has a lot of potentials, doing so is not without challenges. We'll explore the difficulties in integrating AI into the world of higher learning in this brief overview. These challenges include everything from problems with data quality to bias in the training data used in the teaching process. As we negotiate the challenging landscape of AI integration in higher education, it is crucial that we comprehend these difficulties.

5.1 THE ACCURACY IS DETERMINED BY THE QUALITY OF THE INPUT DATA.

The system may learn incorrect or incomplete patterns, producing inaccurate responses, if the training data is not sufficiently diverse or of poor quality (Fuchs, 2023). Additionally, the complexity of the input data, especially when it comes to idiomatic expressions or other linguistic nuances, may have an effect on the accuracy of AI tools. For example, if students provide unclear and irrelevant input data, it may be difficult for the system to produce a precise response.

5.2 RELIANCE ON TECHNOLOGY

By using AI tools in higher education, it is potentially risky for a student who is overly reliant on technology. According to Fuchs (2023), there is a risk of overdependence on technology, which could impede the development of critical thinking skills. This habit may lead to a case of plagiarism that is against the standard of academic integrity (Chan & Hu, 2023).

5.3 BIAS IN TRAINING DATA

A good model of AI tools is based on the data they are trained on. These systems have the potential to perpetuate biases that are inherent in the datasets used for their training. If the trained data contains bias, the model also contains bias (Baidoo-Anu & Ansah, 2023). This biased result may lead to inaccurate information for both students and teachers.

6. THE IMPACT OF AI ON STUDENT-TEACHER INTERACTION IN ONLINE LEARNING ENVIRONMENTS

The use of AI within digital learning platforms has the capacity to greatly influence the interaction between students and teachers. AI technologies have the potential to augment communication, provide assistance, and foster engagement between students and teachers, thereby resulting in enhanced educational achievements (Seo et al., 2021). Nevertheless, it is

imperative to consider certain crucial aspects pertaining to the influence of artificial intelligence on the interaction between students and teachers in online learning settings.

Examining how learners and teachers view the effects of AI systems in online learning environments is crucial (Cruz-Benito et al., 2019). In their 2013 study, Kang and Im showed how elements of student-teacher interaction, such as presence, support, and communication, enhance student satisfaction and learning outcomes. Students' self-esteem, learning motivation, and self-assurance in taking on new tasks are all impacted further by the student-teacher connection (Laura & Chapman, 2009). The impact of AI systems on student-teacher interaction in online learning, however, is less clear. In the classroom, AI systems will "have a profound impact, changing the relationship between teacher and student," according to Guilherme (2019). Further research is required to gain a comprehensive understanding of the mechanisms and underlying factors that influence the dynamics of student-teacher interaction in online learning, particularly in relation to different types of AI systems (Felix, 2020).

A diverse range of AI technologies are anticipated to have an impact on the interaction between students and teachers in the context of online learning. To illustrate, Goel and Polepeddi (2016) devised an artificial intelligence teaching assistant called Jill Watson to enhance the teacher's interaction with students through autonomous responses to student introductions, regular announcement postings, and addressing often requested topics. In their study, Perin and Lauterbach (2018) devised an artificial intelligence-based scoring mechanism aimed at expediting the transmission of marks from teachers to students. Luckin (2017) demonstrated the efficacy of AI systems in facilitating the learning process for both students and teachers. These systems offer continuous feedback on students' learning patterns and their advancement towards achieving their educational objectives. In their study, Ross et al. (2018) devised a system of online adaptive quizzes with the aim of assisting students through the provision of personalized learning materials that catered to their specific requirements. The implementation of this approach resulted in enhanced levels of student motivation and engagement. The study conducted by Heidicker et al. (2017) demonstrated

that the utilization of virtual avatars facilitates collaboration among individuals who are geographically distant from each other, within an immersive virtual environment. This is achieved by enhancing the users' sensation of presence. Aslan et al. (2019) conducted a study in which they used artificial intelligence-based face analytics to enhance the role of teachers as coaches in technology-mediated learning environments. It is crucial to gain a comprehensive understanding of how students and teachers perceive the influence of AI systems (Zawacki-Richter et al., 2019).

7. CONCLUSION

While the use of AI tools in higher education has the potential to benefit both instructors and students, there are also challenges that need to be addressed, such as the lack of pedagogical integration and ethical implications. Therefore, it is crucial to carefully weigh the benefits and challenges of incorporating AI tools into the education system. It is important to note that AI should be used as a tool to enhance education and support teachers, rather than replacing human educators. The role of teachers in guiding and facilitating learning remains crucial in the educational process.

With the development of technology, artificial intelligence (AI) will probably play a bigger role in developing immersive virtual learning environments, anticipating students' learning requirements, and promoting collaborative learning experiences.

In conclusion, AI has the potential to have a significant impact on education via enhanced learning opportunities, individualized training, and task automation. But it's crucial to address moral questions, potential conflicts, and make sure AI is applied in a way that improves education without compromising the role of teachers.

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