



Review Article

Role of Artificial Intelligence in Personalized Learning at Higher Education Institutions

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Abstract

All across the past few decades, artificial intelligence (AI) has been a rapidly expanding field, and its applications have spread to different sectors, including education. In recent years, the prevalence and impact of AI technology integration in higher education have increased. This paper will investigate the growth of AI and its implications for higher education. It begins with an introduction to AI, covering its evolution and current condition. It then examines the different applications of AI in higher education, such as personalized learning, student support, enhanced instruction, efficient administration, and research. The study contends that artificial intelligence has the potential to have a big impact on higher education by offering tailored learning experiences, lowering administrative burdens, and facilitating research in numerous domains. For instance, AI-powered chatbots may provide students with support 24 hours a day, seven days a week, while AI algorithms can evaluate student data to identify problem areas and provide personalized recommendations to improve the learning experience. Moreover, AI can automate administrative activities such as grading and scheduling, allowing academics and staff to focus on more meaningful endeavors. Yet, the report also highlights some of the potential difficulties and worries linked with the advent of AI in higher education. Considerations pertaining to data privacy, algorithmic bias, and ethics are among them. The paper emphasizes the necessity for careful evaluation of these problems to guarantee that artificial intelligence is employed in higher education in a responsible and ethical manner. This research paper underscores the significance of AI for higher education and its potential to revolutionize the ways in which we teach, learn, and conduct research. Yet, it also underlines the significance of understanding the ethical and social implications of AI in higher education in order to guarantee that technology is used responsibly and fairly.

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Introduction

The term "artificial intelligence," or AI for short, has emerged as one of the most game-changing technologies of the 21st century, having an effect on virtually every aspect of our life. Technology has completely altered the ways in which we work, live, and

communicate with one another. Higher education institutions are beginning to grasp that AI has the ability to radically disrupt the way we learn and the way we educate. The development of artificial intelligence has had a huge influence on higher education because of the impact it has had.

Artificial intelligence (AI) is being incorporated into educational institutions to improve outcomes for students, increase operational efficiencies, and stimulate innovation. Students can benefit from more tailored learning experiences due to AI, which can analyze students' unique strengths and weaknesses, adapt their education to their specific needs, and offer individualized feedback. In recent years, academic institutions such as universities and colleges have been investigating various methods by which they can improve the quality of education by incorporating AI into their course work. For instance, AI can assist students who have disabilities in learning in an environment that is more accessible. It is also able to provide virtual tutors to students who require further assistance, thereby lowering the amount of work that must be done by instructors. Another application of AI in higher education is to provide assistance with various administrative responsibilities. In order to reduce the need for human employees, questions asked by students are being fielded by chatbots powered by artificial intelligence. In addition, AI is able to automate mundane duties like grading, scheduling, and record keeping, freeing up faculty members' time to concentrate on responsibilities that are more difficult. The proliferation of AI in higher education has important repercussions, not only for students but also for faculty members. For students, it provides novel and creative approaches to education that may be molded to better meet their specific requirements. It has the potential to assist kids in developing abilities such as critical thinking, problem solving, and decision-making, all of which are important for the employment market. New tools that can be used in the classroom and for research have become available because of advances in artificial intelligence (AI). The proliferation of AI in higher education, on the other hand, is not without its obstacles. The possibility of people losing their jobs is one of the things that worries people the most. It is possible that AI will replace human workers, as it grows more widespread; this would result in job losses and a shift in the workforce. Another issue of concern is the necessity of ensuring that AI is used in a responsible and ethical manner. It is essential to make certain that artificial intelligence is not biased and does not contribute to the continuation of current inequities. To summarize, the proliferation of artificial intelligence in higher education has enormous repercussions, not only for the students but also for the faculty members. AI has the ability to completely change the way we learn and teach, providing students with more individualized learning experiences and teachers with cutting-edge tools to use in the classroom. Yet, it is essential to make certain that AI is applied in a manner that is both ethical and responsible and that the adoption of AI does not result in the displacement of workers or the loss of jobs. It is crucial that we embrace AI while remaining conscious of its influence on society since the future of higher education is intricately linked to AI, and we must do so immediately.

Literature Survey

Researchers are studying both the possible benefits and drawbacks of artificial intelligence's impact on higher

education, which is leading to an explosion for research on the topic. Numerous studies have investigated the application of AI in online learning settings and the influence that this has had on the performance of students in those environments. For example, a study conducted by Kizilcec et al. (2014)^[6] discovered that AI-powered tutoring systems increased student-learning results by offering individualized feedback and support to the learner. In a similar vein, Dabbagh and Kitsantas (2012)^[4] discovered that individualized learning experiences offered by AI-supported online learning environments have the potential to raise the overall level of educational excellence. In other research, the use of AI to administrative work in higher education has been the primary focus. For instance, Sclater and Peasgood (2018)^[7] conducted research to investigate the possibility of artificial intelligence being used to automate administrative operations such as the scheduling and registration of students. According to the findings of the study, AI has the potential to drastically cut the workload of administrative workers and significantly enhance efficiency. In conclusion, a number of research have been conducted to investigate the opportunities and difficulties presented by AI in higher education. For example, a study conducted by Conole (2018) underlined the necessity for educational institutions of higher learning to carefully evaluate the ethical implications of artificial intelligence and its ability to perpetuate biases. In a similar vein, Haaranen et al. (2019)^[5] conducted a study in which they emphasized the significance of investing in staff development to guarantee that faculty members are equipped with the knowledge essential to incorporate AI into their research and classroom activities.

Significance

The integration of AI in higher education has the potential to bring about numerous benefits, including:

Improved teaching

Instructional methods can be improved with the use of AI-based solutions, which can also benefit students. For instance, AI systems can assess comments provided by students to determine areas in which instructors can improve their practice and then provide individualized feedback to assist them in doing so.

Enhanced research

Artificial intelligence can benefit researchers by assisting them in precisely and quickly evaluating enormous amounts of data, which in turn helps them make new discoveries and progress their disciplines.

Improved Accessibility

Artificial intelligence can help educational institutions provide more accessible learning experiences for students with disabilities, such as through the use of speech recognition and text-to-speech software. This benefit is especially beneficial for students who are deaf or hard of hearing.

Student Support

Chatbots powered by AI can be used to give support for students around the clock, answering their questions and assisting them in any way they need. While at the same time ensuring that students receive the help they require, this can reduce the burden placed on faculty and staff.

Effective Administration

Automation of administrative processes, such as student enrollment, grading, and scheduling, can be facilitated with the use of AI. This facilitates more effective administration. Because of this, time may be saved, and errors can be minimized, allowing academics and staff to concentrate on more significant responsibilities.

Personalized Learning

Artificial Intelligence technology can evaluate enormous quantities of data on student performance, behavior, and learning styles to generate individualized learning programmes that are tailored to each student's specific needs. Higher education has traditionally utilized a one-size-fits-all approach to instruction, with professors teaching to the typical student and students expected to keep up with the class's speed and substance. However, this strategy may not be beneficial for children who learn at varying rates, have varying strengths and weaknesses, or come from diverse cultural and language backgrounds. Using AI, students can receive training that is tailored to their own needs and interests. For instance, a learning system driven by AI can analyze a student's responses to practice problems and alter the difficulty level of following questions based on their performance. Or a chatbot driven by AI can provide students with individualized feedback and assistance based on their queries and responses.

It has been demonstrated that personalized learning improves student results and engagement, as well as reduces achievement inequalities between groups of students. In addition, personalized learning enables instructors to make more efficient use of their time by focusing on giving focused help to individual students rather than delivering a one-size-fits-all curriculum. Concerns exist, however, regarding the potential for AI to perpetuate prejudices and aggravate academic disparities. An AI system that proposes courses or majors based on historical student data, for instance, may unintentionally discriminate against particular groups of students depending on their color, gender, or financial background. Educators and institutions must therefore approach the introduction of AI-powered individualized learning with caution and evaluate its ethical implications. However, the integration of AI in higher education also presents challenges, including:

Cost

Bringing artificial intelligence into practice may be quite pricey, and organizations may have to make investments in new hardware, software, and networking infrastructure.

Privacy and security

The development of artificial intelligence creates concerns over the privacy and security of data, and educational institutions have a responsibility to ensure that student data is protected.

Bias and discrimination

AI systems have the potential to be biased and discriminating, which would further entrench existing disparities in the educational system. It is the responsibility of institutions to guarantee that AI is used in an ethical and transparent manner.

Implications for Institutions and Students

The implementation of AI in higher education will have far-reaching implications for both the educational institutions and the students who attend those institutions. When it comes to properly integrating AI, educational institutions will need to make investments in the training and development of its faculty and staff in order to ensure that they have the necessary abilities. Students will need to gain new abilities in order to traverse an educational landscape that is driven by AI. These new skills will include digital literacy, critical thinking, and problem solving. Additionally, the implementation of AI has the potential to alter the ways in which students learn and interact with the content of their courses, resulting in the development of new pedagogical approaches.

Benefits

There are several advantages to be gained from using AI into higher education. To begin, platforms that are powered by AI may provide students with individualized learning experiences, enabling them to learn at their own pace and in a manner that is tailored to their own requirements. Second, AI has the potential to automate administrative duties, hence reducing the amount of work required of faculty members and increasing overall productivity. Finally, artificial intelligence may support research and innovation by providing researchers with access to huge volumes of data that can be analyzed to uncover patterns, linkages, and insights. This is one of the ways that AI can help support research and innovation.

Challenges and Opportunities

In spite of the many positive effects that AI has on higher education, the field is still facing a number of difficulties. To begin, organizations may have difficulties if they do not have the resources necessary to make the necessary financial investments in order to use AI-powered platforms. Second, because AI is capable of automating many of the administrative functions that faculty members are responsible for, there is a possibility that their jobs will be eliminated. Last but not least, some people are concerned that artificial intelligence would help to spread prejudices and exacerbate existing inequality.

Nonetheless, AI also presents a number of prospects for educational institutions at the higher level. To begin, AI has the potential to improve the standard of education by providing individualized educational opportunities that are tailored to meet the requirements of each student. Second, AI has the potential to automate administrative duties, hence reducing the

amount of work required of faculty members and increasing overall productivity. Finally, AI can support research and innovation, providing researchers with access to vast amounts of data that can be analyzed to identify patterns, relationships, and insights.

Conclusion

In conclusion, the development of artificial intelligence (AI) is rapidly causing a shift in higher education, and the implications of this shift are becoming increasingly important. The ways in which we learn, teach, and carry out research could all be significantly altered by the advent of AI technologies. There are a great number of ways in which AI might improve higher education, including individualized instruction, enhanced learning outcomes for students, and expanded educational opportunities for students with a variety of requirements.

On the other hand, there are concerns that AI could eventually replace human teachers, minimize the significance of possessing abilities in critical thinking, and worsen current disparities in educational opportunities. As a result of this, it is essential for teachers and educational institutions to approach the incorporation of AI in higher education with caution, taking into consideration the potential ramifications of this technology on ethics, society, and culture. As artificial intelligence (AI) continues to grow and becomes more widespread in higher education, it is essential for educators to modify their teaching practices and curricula in order to better prepare students for a future in which AI will play a significant role. This may involve building new multidisciplinary programs that incorporate artificial intelligence and machine learning, or it may require placing an emphasis on the development of talents that cannot be copied by machines, such as creativity, emotional intelligence, and ethical reasoning. In general, the development of AI brings both benefits and challenges for institutions of higher learning. The potential of this technology to improve the quality of higher education in the 21st century, as well as its accessibility and relevance to the world, can be tapped by educators and educational institutions that consciously and strategically adopt this technology.

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