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Role of AI in Education

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Abstract

Artificial intelligence (AI) has the potential to revolutionize the way we learn and teach, making it more personalized, engaging, and efficient. AI in education refers to the use of artificial intelligence technologies, such as machine learning and natural language processing, to enhance the learning experience. It involves the use of algorithms that analyze data, identify patterns, and make predictions, enabling educators to personalize learning for each student. The potential benefits of using AI in education are significant. Personalized learning, one of the most significant advantages of AI in education, can lead to better student outcomes, as students can learn at their own pace and in a way that suits their learning style. Intelligent tutoring systems, chatbots, and automated grading and assessment can increase efficiency, save teachers' time, and provide more accurate and consistent feedback. However, there are also challenges associated with using AI in education. Privacy and security concerns, lack of trust, cost, and potential bias are some of the challenges that need to be addressed. Ethical considerations such as ensuring accessibility, transparency, and fairness in AI-based education systems also need to be taken into account. Despite these challenges, the potential of AI in education is immense. AI can provide better data analysis, enabling educators to make data-driven decisions. In this review we described role of AI in management, promotion of education which describe the effect of AI in education sector.

Keywords: AI, Education, Personalized learning, chatbots

INTRODUCTION

Artificial Intelligence (AI) has been transforming various industries, and education is no exception (Yeruva, 2023). AI has the potential to revolutionize the way we learn and teach, making it more personalized, engaging, and efficient (Alneyadi, Wardat, Alshannag, & Abu-Al-Aish, 2023). In this review article, we will explore the role of AI in education and how it is changing the face of learning (T. Vinoth Kumar et al., 2022) (Samad, Hamza, Muazzam, Ahmad, et al., 2022). AI in education refers to the use of artificial intelligence technologies, such as machine learning and natural language processing, to enhance the learning experience (Alneyadi et al., 2023). It involves the use of algorithms that analyze data, identify patterns, and make predictions, enabling educators to personalize learning for each student (Khan et al., 2022). The potential benefits of using AI in education are significant. Personalized learning, one of the most significant advantages of AI in education, can lead to better student outcomes, as students can learn at their own pace and in a way that suits their learning style (Shrivastava et al., 2023). Intelligent tutoring systems, chatbots, and automated grading and assessment can increase efficiency, save teachers' time, and provide more accurate and consistent feedback. However, there are also challenges associated with using AI in education. Privacy and security concerns, lack of trust, cost, and potential bias are some of the challenges that need to be addressed (Jarrah, Wardat, & Gningue, 2022). Ethical considerations such as ensuring accessibility, transparency, and fairness in AI-based education systems also need to be taken into account (AlArabi, Tairab, Wardat, Belbase, & Alabidi, 2022) (Tariq et al., 2022). Despite these challenges, the potential of AI in education is immense (M Al-Bahrani, Gombos, & Cree, 2018). AI can provide better data analysis, enabling educators to make data-driven decisions. It can also improve student engagement by providing interactive and engaging learning

experiences (Yang et al., 2022) (Wardat, Belbase, & Tairab, 2022). With the help of AI, education can be made more accessible and inclusive, enabling learners of all backgrounds to access high-quality education. In the following sections of this review article, we will delve deeper into the applications of AI in education, including personalized learning, intelligent tutoring systems, chatbots, and grading and assessment (Madasamy, Raja, AL-bonsrulah, & Al-Bahrani, 2022). We will also discuss the benefits and challenges of using AI in education and the ethical considerations that need to be taken into account. Finally, we will explore the future of AI in education and the opportunities it presents for innovation and growth.

METHOD RESEARCH

The research method used in this study is qualitative descriptive method. The type of data used in this study is qualitative data, which is categorized into two types, namely primary data and secondary data. Data sources are obtained through library study techniques that refer to sources available both online and offline such as: scientific journals, books and news sourced from trusted sources. These sources are gathered based on discussion and linked from one piece of information to another. The data collection techniques used in this study were observation, interview and research. This data is analyzed and then conclusions are drawn.

RESULT AND DISCUSSION

Personalized Learning

The use of artificial intelligence (AI) in education has enabled personalized learning, revolutionizing the way students learn (Rana et al., 2022). Personalized learning is a teaching method that tailors learning experiences to each student's individual needs, strengths, weaknesses, and interests (Samad, Hamza, Muazzam, Ahmer, et al., 2022). Personalized learning uses technology to adapt instruction to each student's level and pace of learning (Zarei et al., 2022). AI plays a critical role in personalized learning by using machine learning algorithms to analyze data and identify patterns in students' learning behaviors, preferences, and achievements (Samad, 2022). AI can then use this data to provide tailored learning experiences that meet the specific needs of each student (Samudrala et al., 2022). For example, AI can recommend appropriate learning resources, suggest areas for improvement, and adjust the difficulty level of learning tasks. One of the primary benefits of personalized learning is that it helps to ensure that each student receives the support and guidance they need to reach their full potential. Personalized learning can help struggling students catch up, while advanced students can be challenged at their level (Gningue, Peach, Jarrah, & Wardat, 2022). By providing a personalized learning experience, students are more engaged and motivated to learn, which can lead to better academic performance and higher retention rates (Al-Abboodi, Fan, Mahmood, & Al-Bahrani, 2021). AI-based learning platforms can provide personalized learning experiences in several ways (Ibrahim, Al-Awkally, Samad, Zaib, & Hamza, 2022). For example, AI can analyze students' past performance to identify areas of difficulty and provide targeted support in those areas (Alarabi & Wardat, 2021). AI can also adapt to the student's learning pace, slowing down or speeding up instruction as necessary (Mohammed Al-Bahrani, Alhakeem, & Cree, 2020). Furthermore, AI can provide

customized feedback on students' progress and offer suggestions for improvement, leading to a more individualized and effective learning experience. AI-based personalized learning has been successfully implemented in various educational contexts, such as K-12 schools, higher education, and corporate training (Mohammed, Samad, & Omar, 2022). For example, Carnegie Learning's AI-powered math software has been shown to improve student performance in math by up to 30%. Similarly, Duolingo's AI-based language learning platform provides a personalized learning experience tailored to each student's proficiency level, interests, and learning style (Al‐Bahrani, Majdi, Abed, & Cree, 2022). Despite the potential benefits of personalized learning with AI, there are some challenges that need to be addressed. One challenge is the need for reliable and accurate data to inform the AI algorithms (Wu et al., 2022). The quality of the data can affect the accuracy of the personalized learning experience, so it is important to ensure that the data is accurate and up-to-date. Another challenge is the need for training and professional development for teachers to effectively implement AI-based personalized learning (Zahmatkesh et al., 2022). Teachers need to be trained on how to use the AI tools and how to interpret and use the data generated by the algorithms. AI-based personalized learning has the potential to transform the way students learn and achieve their full potential. Personalized learning can provide tailored support to each student, leading to better academic performance, higher retention rates, and increased engagement. AI can provide customized feedback and suggestions for improvement, enabling a more individualized and effective learning experience (Jarrah, Almassri, Johnson, & Wardat, 2022). While there are challenges that need to be addressed, the benefits of AI-based personalized learning in education are significant and promising (Balamurugan et al., 2022) (Anjan Kumar, Singh, & Al-Bahrani, 2022).

Chatbots

Chatbots are computer programs designed to simulate human conversation, enabling them to interact with people through text or voice interfaces (Sreenivasu et al., 2023). In recent years, chatbots have been increasingly used in education, providing personalized support to students, automating administrative tasks, and offering new opportunities for engagement (Yeruva, Choudhari, et al., 2022). One of the primary benefits of using chatbots in education is their ability to provide personalized support to students. Chatbots can act as virtual tutors, providing instant feedback, answering questions, and guiding students through their learning journey (Sridhar et al., 2022). Chatbots can also provide personalized recommendations for learning resources, suggest areas for improvement, and track progress, providing a more individualized learning experience. Another benefit of using chatbots in education is their ability to automate administrative tasks (Mohammed Al-Bahrani, Bouaissi, & Cree, 2022). Chatbots can handle routine tasks such as scheduling, grading, and answering frequently asked questions, saving teachers' time and enabling them to focus on more high-value tasks such as teaching and mentoring (Gningue et al., 2022). This automation can also help to reduce administrative errors and inconsistencies, ensuring that tasks are completed efficiently and accurately. Chatbots can also offer new opportunities for engagement in education (Patil, Raut, Pande, Yeruva, & Morwani, 2022). By providing a conversational interface, chatbots

can make learning more interactive and engaging, promoting active learning and increasing student motivation. Chatbots can also be used to gamify learning, offering rewards and incentives for completing tasks and achieving learning goals (Stoica & Wardat, 2022). Despite the benefits of chatbots in education, there are some challenges that need to be addressed (Abbas, Al-abady, Raja, AL-bonsrulah, & Al-Bahrani, 2022). One challenge is the need to ensure that chatbots are designed with a student-centered approach, taking into account students' needs, interests, and learning styles (Al-Abboodi, Fan, Mhmood, & Al-Bahrani, 2022). Chatbots also need to be designed to promote accessibility, ensuring that all students can access and use the technology. Another challenge is the need to ensure that chatbots are accurate and reliable, providing correct information and avoiding biases or errors. Several educational institutions and companies have already implemented chatbots in their education systems (Reddy Yeruva et al., 2023). For example, Georgia State University implemented a chatbot named "Pounce," which provides personalized support to students, answering questions and providing guidance on academic and administrative matters. The University of Adelaide in Australia developed a chatbot named "MyUni," which provides support to students on various administrative matters, such as enrollment, timetables, and course information (Mohammed Al-Bahrani, 2019) (Yeruva, Durga, et al., 2022). Similarly, Duolingo's language learning chatbot provides conversational language practice and feedback to students (Gningue et al., 2022).

AI in Grading and Assessment Process

AI can automate the grading and assessment process, providing instant feedback to students and saving educators time and effort (AlAli, Wardat, & Al-Qahtani, 2023). AI algorithms can analyze student work and provide feedback based on pre-defined criteria, enabling students to receive immediate feedback on their performance (M Al-Bahrani et al., 2018) (Li et al., 2022). One example of AI-powered automated grading is the use of automated essay grading systems (Stoica & Wardat, 2021). These systems use natural language processing and machine learning algorithms to analyze student essays and provide instant feedback and scoring. Benefits of AI in Education: Personalized Learning, Increased Efficiency, Improved Student Engagement, and Better Data Analysis The use of AI in education offers several benefits, including personalized learning , While there are many benefits to incorporating AI in education, there are also several challenges and concerns that need to be addressed .

Benefits of AI in Education

Personalized Learning

AI can help personalize the learning experience for each student, allowing them to learn at their own pace and according to their individual needs and abilities. This can lead to improved learning outcomes and increased student engagement.

Increased Efficiency

AI can automate repetitive tasks such as grading, data analysis, and administrative tasks, freeing up time for teachers and students to focus on more meaningful tasks.

Improved Student Engagement

AI can help improve student engagement by providing interactive and engaging learning experiences. For example, chatbots and virtual assistants can make learning more fun and interactive, and adaptive learning technologies can help students stay engaged by presenting material at their level of understanding. Better Data Analysis: AI can analyze large amounts of data and provide insights into student performance, allowing teachers to better understand their students and tailor their instruction accordingly. This can lead to improved learning outcomes and better student performance.

Challenges of AI in Education:

Privacy and Security Concerns

The collection and analysis of large amounts of personal data from students could pose a risk if it falls into the wrong hands. Institutions must ensure that they are taking appropriate measures to protect students' privacy and prevent data breaches.

Lack of Trust

Students may be hesitant to accept grades or feedback generated by an AI system, preferring to have human input and evaluation. It is important to establish trust with students and make them feel comfortable with the technology.

Cost

AI systems can be expensive to implement and maintain, which can be a challenge for educational institutions that are already facing budget constraints. Institutions must carefully consider the costs and benefits of implementing AI systems in their classrooms.

Potential Bias

AI systems can be biased, particularly if they are trained on biased data. This can result in unfair treatment of certain students and perpetuate existing inequalities. Institutions must ensure that their AI systems are unbiased and do not perpetuate existing inequalities.

Ethical Considerations

Ensuring Accessibility: AI-based education systems must be designed with accessibility in mind, ensuring that all students, including those with disabilities, can access and use the technology.

Transparency

AI systems must be transparent, with clear explanations of how they make decisions and why. This can help build trust with students and ensure that they understand the technology.

Fairness

AI-based education systems must be fair, ensuring that all students are treated equally and not discriminated against based on their race, gender, or other factors.

Future of AI in Education:

The future of AI in education is bright, with opportunities for innovation and growth. AI has the potential to transform the way we teach and learn, making education more personalized, efficient, and effective. In the future, we can expect to see more advanced AI systems that can understand and respond to human emotions,

provide more nuanced feedback, and even create personalized lesson plans for each student.

CONCLUSION

While there are many benefits to incorporating AI in education, there are also several challenges and concerns that need to be addressed. Institutions must carefully consider the costs and benefits of implementing AI systems in their classrooms and ensure that they are taking appropriate measures to protect students' privacy and prevent bias. By balancing the benefits and challenges of AI in education, we can create a more personalized, efficient, and effective learning experience for all students.

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