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THE ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Artificial intelligence (AI) has revolutionized various aspects of our lives, and education is no exception. In recent years, AI has been increasingly integrated into the field of education to provide personalized learning experiences and adaptive learning environments with the aim of enhancing the learning process. This thesis aims to explore the role of AI in education, discussing its potential benefits, challenges, and ethical considerations.

Personalized education refers to the tailoring of learning experiences and instruction to meet the individual needs and preferences of each student. The role of AI in gathering and analyzing learner data is crucial for providing personalized learning experiences [2, p. 4]. With the help of AI-powered algorithms, educators can create personalized learning paths, recommend specific resources, and provide targeted support to students. One way AI facilitates personalized education is through adaptive learning platforms. These platforms utilize AI to assess students' performance, identify areas of difficulty, and deliver customized content and activities to address their individual learning needs. For example, AI algorithms can analyze students' responses to questions and adapt the difficulty level of subsequent questions based on their performance, ensuring that each student is being challenged at the right level.

In addition, AI-powered educational software can provide real-time feedback to students, allowing them to track their progress and receive immediate support when they encounter difficulties. This personalized feedback loop can enhance student engagement and motivation, as it fosters a sense of autonomy and mastery in the learning process.

The integration of AI in personalized education offers various benefits to students, educators, and educational institutions. Firstly, AI enables a more efficient use of educational resources by automating routine tasks such as grading, data analysis, and content curation. This allows educators to focus on providing personalized support and mentoring to students, ultimately improving the overall quality of education. Moreover, AI-driven personalized education can suffice for diverse learning needs, ensuring that every student receives instructions that suit their individual requirements. By accommodating different learning styles, paces, and preferences, AI promotes inclusivity and equity in education, addressing the unique needs of each student. Additionally, personalized education powered by AI has the potential to improve learning outcomes by identifying and addressing gaps in students' understanding in real time. Through continuous assessment and adaptation, AI can help students master concepts at their own pace, leading to deeper learning and retention.

As an example, the AI-powered language-learning application Duolingo can be described. It offers personalized training pathways based on the user's skills, preferences, and progress. The platform integrates a smart bot that adapts to the learner's abilities, providing a tailored learning experience. Duolingo maintains an optimal level of challenge to keep learners engaged through a points-based reward

system, making it an effective solution for continuous learning and knowledge maintenance.

While the role of AI in personalized education is promising, it also presents certain challenges and considerations. One of the primary concerns is the ethical use of AI in education, particularly regarding data privacy and student autonomy. As AI systems collect and analyze large amounts of student data, there is a need to ensure that this information is protected and used responsibly. The use of AI applications can be in conflict with privacy and self-determination of those involved - the (partial) modelling of a student can be seen as a violation of this, especially if no restrictions are placed on the possible use of such a model [3, p. 14]. Guidelines and regulations must be clearly established to safeguard student privacy and prevent the misuse of personal data. Moreover, the implementation of AI in personalized education requires significant investment in technology infrastructure, professional development for educators, and ongoing technical support. Ensuring righteous access to AI-powered educational resources and training for teachers is essential to prevent furthering the digital divide and disparities in educational opportunities.

Besides, there is a need to critically examine the role of AI in shaping the learning experience and the potential impact on human interaction in education. While AI can provide personalized support, it should complement, rather than replace, the role of teachers in fostering meaningful connections with students and providing social-emotional learning experiences.

Looking ahead, the role of AI in personalized education and adaptive learning is poised to expand further, driven by advancements in machine learning, natural language processing, and educational data analytics. As AI technologies continue to evolve, they have the potential to offer even more sophisticated personalized learning experiences, utilizing data and adaptive feedback mechanisms to satisfy diverse learning needs.

Furthermore, the integration of AI in education necessitates ongoing research and evaluation to assess its impact on student learning outcomes, engagement, and well-being. Lengthwise studies and experimental research can provide valuable insights into the effectiveness of AI-powered personalized education and inform best practices for its implementation.

In conclusion, the role of AI in personalized education and adaptive learning is transformative, offering the potential to revolutionize the way students learn and educators teach. By harnessing the power of AI to provide tailored learning experiences, address individual learning needs, and enhance educational outcomes, personalized education is primed to become more inclusive, effective, and engaging. However, it is essential to approach the integration of AI in education thoughtfully, addressing ethical considerations and challenges, and ensuring that AI complements the essential role of educators in nurturing the holistic development of students.

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