

CrossRef DOI of original article:

A Study of Artificial Intelligence in Education

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Received: 1 January 1970 Accepted: 1 January 1970 Published: 1 January 1970

Abstract

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and mimic human cognitive processes. It includes a wide range of tools that enable machines to carry out operations that otherwise need human intelligence. Learning, logical thinking, problem-solving, perception, speech recognition, and language understanding are some of these tasks. One of the key areas where AI will have a profound effect is education. Both students and teachers benefit from enhanced educational experiences because of AI. It offers a personalized learning experience. Although AI in education hasn't received much attention over the years, understanding its concepts, functions, methodology, and applications would provide the groundwork for the development of the education sector.

Index terms— artificial intelligence (AI), chatbots, robotics, virtual reality (VR).

1 A Study of Artificial Intelligence in Education

Anjana C M Abstract-Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and mimic human cognitive processes. It includes a wide range of tools that enable machines to carry out operations that otherwise need human intelligence. Learning, logical thinking, problem-solving, perception, speech recognition, and language understanding are some of these tasks. One of the key areas where AI will have a profound effect is education. Both students and teachers benefit from enhanced educational experiences because of AI. It offers a personalized learning experience. Although AI in education hasn't received much attention over the years, understanding its concepts, functions, methodology, and applications would provide the groundwork for the development of the education sector.

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3 I. Introduction

AI is now applied in education in a number of different ways, from chatbots that offer 24/7 student help to personalized learning algorithms that adjust to the needs of each student. Additionally, administrative duties like grading assignments and delivering feedback are being automated using AI-powered technologies. AI is also being used to analyze vast volumes of data in order to find trends and insights that can guide the creation of new educational initiatives and regulations. Artificial intelligence (AI) has the potential to revolutionize the way we think about education. AI-powered tools and technologies are improving the learning experience for students in ways we never thought possible, from personalized learning algorithms to virtual and augmented reality. AI technologies were increasingly being used to personalize education for individual students. By collecting data on a student's learning style and comprehension level, AI tools can provide personalized feedback and recommendations. AI can process large volumes of educational data to identify trends, patterns, and correlations that can inform education policies and practices.

Adaptive learning is a popular AI-based method that adjusts the learning experience to match the learning pace and style of each student. Additionally, AI-powered tutoring systems can provide personalized support

and feedback in real-time enhancing student learning outcomes. To complement conventional teaching materials, AI systems can provide educational content including tests, practice questions, and study guides. AI can also identify students who are at risk of falling behind or dropping out, allowing educators to intervene early and provide additional support. With AI's ability to personalize education, students can receive improved academic performances and great engagement in learning process. Not only students, teachers can also benefit from personalized professional development opportunities that can help them strengthen their teaching strategies and stay current with the most recent findings in the field of education with the assistance of AI.

4 II. AI Education Model

In AI learning system, learner model is critical for improving independent learning capabilities. It is established based on behavior data of learners generated from the learning process. Learners' thinking and capability is analyzed to assess their learning abilities. Then knowledge analysis is mapped to obtain learners' knowledge mastery. Learner modeling establishes connections between learning results and various factors including learning materials, resources and teaching behaviors [1]. Knowledge model establishes knowledge structure map with detailed learning contents, usually including expert knowledge, rules of making mistakes often made by learners and misunderstanding [2]. Combining knowledge field model and learner model, teaching model determines the rules to access knowledge field, which enables instructors to tailor teaching strategies and actions. Learners are likely to behave favorably, take action, or ask for assistance as education progresses. The built-in teaching ideas of tutoring models can be used by AI systems to always be ready to offer assistance. User interface explains learners' performance through multiple input media (voice, typing and click) and provides output (texts, figures, cartoons and agencies). The sophisticated human-machine interface offers AI-related capabilities such as natural language interaction, speech recognition, and learner emotion detection. The customization and personalization of curriculum and content in accordance with students' needs, abilities, and capabilities is a significant way that AI has been used to improve students' learning [3]. AI in education has also eliminated some barriers to access to learning opportunities, such as national and international borders, enabling global access to learning through online and web-based platforms [4]. The internet is currently the main source of entertainment, education, and information. Hours spent learning in classrooms using chalkboards have drastically dropped since the start of the Covid-19 pandemic. It also comes after the effect of lockdowns and social restrictions. Several educational institutions across the world are already using AI. The emotional state of a child affects their motivation, involvement, and focus while learning. When emotion detection technology is applied, virtual surroundings can be equally as effective as actual learning environments. As gamification is acknowledged, it is possible to make learning and teaching more enjoyable. In addition, AI can identify areas where students are having difficulty and offer support so that they can finally excel.

One application of AI is chatbots. It is the technical core of the future. More and more chatbots are being used in educational institutions where students utilize computers or iPads to communicate with the bots. It is intended to make certain things easier for students to understand, like Mathematics or reading comprehension. The potential uses of chatbots go beyond simply imparting knowledge to students. Moreover, if necessary, they can assist with the analysis. It lessens the workload placed on the teachers. Additionally, it can also swap emails between parents and teachers and record parent-teacher conferences.

Over the past few years, the application of AI and robotics in education has increased. Both teachers and students can use it within the system. It may increase the safety and involvement of students. Both educators and students can benefit greatly from using robots as learning tools. Both can have enjoyable discussions that go in-depth on the subject. Robots may provide teachers with a method to spend more time directly instructing kids who require extra assistance. They may be able to try out new teaching techniques as a result.

The education sector already uses AI with VR. It instructs pupils in everything from History to Mathematics. A 3D computer-generated environment can be explored and interacted with in virtual reality (VR). Students can maintain relationships with one another through VR. Students can safely speak across distances while using the same VR programme while seated in various classrooms. Teachers and students can watch things that they might never have learnt about or seen in real life. Teachers now have the chance to experiment with more interesting teaching strategies. Both teachers and students will gain from more involvement and in-depth learning.

5 IV. Conclusion

In conclusion, AI has had a huge impact on learning and education. For parents who are constantly concerned about their children's social lives, AI has proven to be beneficial. They may now more closely monitor their children's online interactions than ever thanks to AI technologies. Software is used in educational institutions to analyze data points, such as student comprehension of the lessons. Students are then divided into groups based on their needs. AI can also make teachers and classes fully available anywhere, 24/7. It uses AI algorithms to give students individualized feedback on tests, assignments, and other materials. The adoption of AI in the education sector will enable students as well as teachers to build a successful future for themselves.

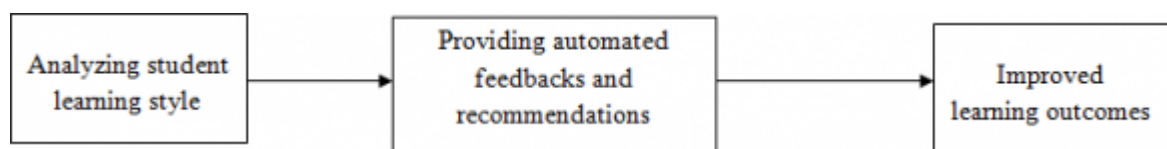


Figure 1: A

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