

Artificial intelligence in education and schools

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Abstract . This work describes how artificial intelligence can be used and how it is used in the education sector. According to the 21st International Conference on Artificial Intelligence in Education held in 2020 , AIED is one of the emerging fields in educational technology. The use of AI is still unclear for educators on how to take advantage of it on a wider scale and how AI can impact teaching and learning in higher education. The impact of AI in education and its pros and cons are presented here. It also describes a concrete way to develop an AI enabled platform for education and finally the consequent effects of AI in education.

Keywords: Artificial intelligence; education; school management

I. INTRODUCTION

According to the 2018 Horizon report, experts expect the use of AI in education to grow by 43% between 2018 and 2022. The application of AI in education has been the subject of research for the past 30 years. The report done by Research and Markets, in 2019 the global AI Education market reached \$1.1 billion and is expected to reach over \$25.7 billion by 2030.

The forerunners of the application of AI in education are found in the works of psychologists B.F. Skinner, also known as the father of behaviorism, who was a professor at Harvard University from 1948 until his retirement in 1974, and Sidney Pressey, who was a professor at Ohio State University in 1920.

II. ARTIFICIAL INTELLIGENCE IN EDUCATION

The International Society for Artificial Intelligence in Education (AIED) is an interdisciplinary community at

the boundaries of computer science, education, and psychology. The AIED International Society was launched on January 1, 1997. It brings together researchers by organizing the International Journal of AI in Education (IJAIED) and a series of AIED conferences.

In general, there are four areas of AIED in academic support services and institutional and administrative services such as profiling and prediction, assessment and evaluation, adaptive systems, personalization and intelligent learning systems. The field of AI is both innovative and derivative.

Artificial intelligence is an emerging technology that has begun to change educational tools and institutions. Education is a field where the presence of teachers is mandatory, which is the best educational practice, the emergence of artificial intelligence is changing the work of teachers who are indispensable in the education system. AI mainly uses advanced analytics, deep learning and machine learning to observe the speed of a particular individual among others.

As AI solutions continue to reach a higher level, it helps identify gaps in teaching and learning and upskills education. AI can drive efficiency, personalization, and streamline administrative tasks to give teachers the time and freedom to provide understanding and adaptability—uniquely human abilities where machines would struggle. With the combination of machines and teachers, it is possible to extract the best results from the students.

III. THE IMPACT OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Almost artificial intelligence is impacting every area of our lives in the future and out of all these the education sector will be greatly affected as teaching and learning is a major part of life and the current education system has a lot of changes to be desired. Schooling in the old days is not as flexible as what future AI in education will present. Teachers, who play the most important role in the education system, are not scalable and expensive. In some of the countries, teachers are burdened with heavy paperwork and are undervalued. AI can help each individual individually by giving them a distinct curriculum based on their interests and skill assessments.

IV. BENEFITS OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Nowadays, young people tend to spend a lot of time with their smartphones or tablets. This gives them a chance to learn for ten to fifteen minutes in their free time using AI applications. AI helps us understand the mood or ease of the student during lectures by using gesture recognition technology. As artificial intelligence becomes more sophisticated, the machine reads the student's facial expressions or gestures and uses them to understand if the student is having trouble understanding the lecture and modify the lesson so that the student can continue easily.

Personalization of academic curriculum can be done by AI-powered machines. AI tools can make global classrooms possible, including people with visual or hearing impairments. This can also help students who cannot attend classes due to illness. In a normal education system, the teacher grades students on homework and tests, which would take a lot of time. Here, when AI steps in, these tasks will be handled quickly. It also helps in suggesting ways to bridge learning gaps.

AI provides several resources to people who speak different languages or have hearing or visual impairments. Presentation Translator provides subtitles in real-time mode, which is an AI-based system application. For example, with the help of Google Translate, students can read and hear in their

national language. For more interactive sessions, modern technologies such as VR and gamification are useful.

There were already some settings where multiple-choice tests were scored by machines, and now developments are being made in the direction where written responses such as paragraphs, statements can be scored using machines. This makes the teacher's job easier and does not waste time, and this saved time can be used to focus more on individual assessment of students and their development.

Admission and enrollment processes may also be done with AI in the future and its full potential is yet to be revealed. AI can help students prepare for homework or tests at home. AI in the near future will be able to respond to a range of learning styles. Thanks to artificial intelligence, tutoring and training programs are becoming more and more advanced. AI applications such as AI tutors for learners are being developed for education.

AI can create groups of students that are suitable for specific tasks. This is known as adaptive group formation. AI application software that can instantly grade a student's essays. These essays are added to a central database and future essays can be compared using the previous essays available in the database.

Artificial intelligence in education is a computer-based technology that provides personalized, adaptive and insightful teaching. The key parts of the AIED system is the domain knowledge model that provides the system's ability to perform the tasks, leading students to consider whether to contribute to the solution. The learner model that provides a representation of the learner in terms of their developing knowledge and skills. The pedagogy model is the component that represents the teaching capability of the system and finally the interface component that provides the channel through which the learner and the system communicate.

The other component of AI that is extremely useful in education is the voice assistant. It is an innovative application of AI. This includes Google Assistant, Microsoft's Cortana, Apple's Siri and Amazon's Alexa. These voice assistants help students converse directly

with the educational material that is present on the Internet and installed devices without the involvement of their teacher.

Traditional teaching methods are becoming old-fashioned and are slowly being discarded by various educational institutions and some universities. They have already started offering students voice assistants instead of providing them with printed study materials or websites with complex information about information related to their campus. As an example, Arizona State University offers Amazon's Alexa to its new students in an effort to provide students with more regular, concise and accurate institutional information about their needs on campus.

Voice assistants can be used at home and in other non-educational locations to access any learning assistance. The main purpose of voice assistants here is to provide answers to frequently asked questions about the needs of the campus or about the specific schedule and courses of each student, which helps the institution to reduce the cost of printing a handbook that is only used temporarily during the initial period of their joining the institution and helps to reduce the requirement for internal support. The use of this technology is expected to escalate in the coming years.

As artificial intelligence becomes a rapidly growing aspect of our daily lives, it's no wonder that education systems are racing to catch up with the need to cultivate more talent to support the AI growth engine. However, education is not just about science, technology, engineering and mathematics (STEM). But the education industry is being changed by the AI curriculum. Intelligent systems are rapidly changing educational institutions from elementary to higher education, as well as adult and advanced learning, to help people learn effectively and meet their learning goals.

The intelligent learning system is used to stimulate individual learning. Depending on the neural networks, the algorithms, they can decide against an individual student. Students are now exposed to the vast number of higher education opportunities with the help of AI. AI can completely lead to advanced changes in the field of education. Robots can increase grammar power and

create digital content. Classrooms had already started digitized learning.

The wave of investment and increased interest in artificial intelligence will affect universities in the future. The increase in the international student market, the democratization of higher education and the increase in financial pressure regarding the increase in the number of students who want to go through higher education will be the main reasons to look for AI in higher education.

V. AI-BASED SOLUTIONS IN EDUCATION

There are many technology solutions in the education industry like Dream Box, Khan Academy, Achieve3000 etc .. There are several educational platforms based on AI technology.

- Third Space Learning
- Little Dragon
- CTI
- Brainy
- Thinker Math
- Carnegie learning

The Third Space Learning system was created with the help of scientists from University College London. It helps recommend ways to improve teaching techniques, such as giving a warning when the teacher's explanation is slow or too fast. Little Dragon creates smart apps that analyze the user's facial expressions or gestures and adapt the user interface accordingly. Little Dragon also creates educational games for children.

Several companies such as Carnegie Learning and Content Technology have started implementing AI for testing, learning and feedback in the education system from Pre-KG to college level by developing high-level instructional design and digital platforms. An online service called Cram101 from the company CTI uses artificial intelligence to study textbooks and theory papers and determine the highlights of the material online. It also generates practice tests and flash cards as exercises for students. Another platform, known as Netex Learning, has dedicated itself to the application

of new technologies in the world of learning and works to provide digital learning in educational institutions and companies. It encourages educators to promote digital curricula, used audio, video and voice assistants, etc. Technologists believe that the teacher may be replaced by robots in the simple future. Augmented reality will also be part of the classroom.

VI. DEVELOPING AN AI EDUCATION PLATFORM

There are six main steps to developing an AI platform for education.

Step 1. Explore existing solutions.

Step 2. Consider the content of the application, which should be both interesting and interactive.

Step 3. Discuss your project requirements with the development team.

Step 4. The application should be thoroughly and properly tested to avoid errors.

Step 5. Promote the app and get feedback after its launch.

Step 6. Update your app regularly.

Initially, we need to carefully analyze the existing solutions and add new features to them so that the user is attracted to your solution instead of others. Explore design ideas. Users always prefer useful content, so you can choose topics like medicine, literature, math and more. This useful content can also be obtained from professors in various universities or colleges and from various sources such as courses, training programs.

You should clarify the business objectives and requirements of the project before developing the project. The development team should be an experienced team of software developers and they should have experience in the field of artificial intelligence. You can create a simple launch version of your app or platform, and after taking feedback from users and their reviews, you can regularly update your platform, adding additional content or additional features. An excellent user experience should be provided to attract more users. This can happen when there are no user complaints, and for that to happen, we need to find and fix bugs before launching the platform. This error correction can be performed by

qualified quality assurance engineers. Regular platform upgrade is required based on user feedback.

VII. DISADVANTAGES OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Despite the huge opportunities that AI offers, there can also be some potential risks with it. AI is likely to become either the best or the worst thing to happen to humanity. AI can support teaching and learning, but with the development of AI applications in higher education, new ethical implications and risks are emerging. One such example is that due to the ongoing coronavirus pandemic and budget cuts, administrators may consider replacing teaching with profitable automated AI solutions. If the use of AI in education increases, there may be a chance that personal interactions will decrease and students will become addicted to technology and sometimes this can harm the learners instead of helping them.

Faculty members, student advisors, teaching assistants, and administrative staff may fear that a smart tutoring system that is an application of AI could replace them. The AI system requires a huge amount of data, including student and staff information, which is confidential and leads to serious privacy issues. Compared to the cost of installation, maintenance and repair, AI is very expensive. Only heavily funded educational organizations can afford to indulge in such high technology. When this technology is relied on too much, it can cause a lack of personal connections and can harm users in this perspective. When something like natural disasters or accidents happen and the AI needs repairs, we can never know how much data is lost.

VIII. CONCLUSION

AI in education is a revolutionary change. According to a report issued by the Center for Integrative Research in Computing and Learning Sciences, it is stated that the next level of using AI in education is yet to be invented. So people working on AI applications need to inform educators and education policy makers in depth about this. Although there are several disadvantages of using AI in the education sector, our future is AI, so the education system should start exposing its students to this kind of technology that has started to use some AI. The impact of AI will be seen first in the lowest

educational levels and gradually increase to higher education. The ultimate impact of artificial intelligence in education will only be determined by time. The main purpose of AI is to facilitate the work of the teacher, but not to replace him.

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