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ARTIFICIAL INTELLIGENCE IN EDUCATION: CHALLENGES AND WAY FORWARD

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Abstract

Artificial intelligence is a branch of Computer science that is concerned with the design of intelligent devices that displays features or characteristics related with Human intelligence. Its application in education is important as it makes learning effective and efficient. However, there are challenges that faces the use of AI in instructional delivery. This study therefore discussed AI in education, its challenges, and the way forward as it relates to instructional delivery. The study concluded that AI in the present era is relevant and good for instructional delivery and recommended among others that teachers and facilitators key into the use of AI for instructional delivery.

Introduction

Artificial intelligence is a branch of Computer science that is concerned with the design of intelligent devices that displays features or characteristics related with Human intelligence. Artificial intelligence can simply be defined as designing machines to make them behave like humans, i.e., reason and process. They have the power to go as far as spatial processing, language processing and even image processing.

Artificial intelligence has 6 major branches, and they include: Machine Vision, Robotics, Expert System, Natural Language processing, Machine learning and Deep learning.

Machine Vision- this is a branch of AI that is based on human's ability to see, recognize, and identify. This branch of AI has great human perception and can recognize objects with great speed and accuracy. The idea of machine vision is used today in video surveillance, bio-metric face scanning, medical image analysis, autonomous facial recognition, etc. The idea of machine vision can be used in education of taking class attendance because the devices are capable of recognizing faces. This will help the teacher to save time in process on ensuring and keeping proper attendance records.

Robotics- this branch has to do with the designing, production and controlling of robotics. Over the years, robotics has been built to carry out functions which are not education related but nowadays, robotics are now built to act as an educational instructor. The most common and well-known example is provided by Avatarion, a Swiss company that creates robots connected to the Microsoft Azure IoT Hub to enable physically absent students in a class to participate in the learning process by giving them full video and audio connections in their home or hospital. The student uses a tablet to control the robot's movements and responds to questions by raising the robot's hand and speaking through a connected microphone and speaker (Mamudu & Lamido, 2017).

Expert system- is the ability of computer to copy and replicate a human expert on a particular subject area to solve a problem in that area. This idea is related to the one used in Telemedicine. The idea of Expert system is used in intelligence tutoring system which plays the role of a professional tutor and provide professional answers to solve a certain problem.

Natural Language Processing- NLP is the ability of computers to assist in human natural language and communication methods. The functions embedded in NLP can translate languages and web pages in a second, communicate directly in form of chatbox and even help as writing assistants. Platforms such as google translate can translate web pages in a split second to ones preferred language and thus make the user to understand the content. Another example is chatbox which allows processing of direct communication like that of robot. Another example is twitter bot.

Machine Learning- is the most advanced area of AI. It involves the designing, training, and deploying of models to application through algorithm and scoring system which can be used to grade assignment.

Deep learning- is the neural network used to understand machine learning.

Artificial Intelligence in Education

Artificial Intelligence has penetrated and influence growth in education through the invention of educational applications, web searches and several learning platforms with several features they

can perform. Based on the branches of AI explained above, the below examples are AI in education categorized under these branches.

1. Expert system- Educational AI's that function like this include Intelligent Virtual Reality.

A few examples under this category include:

(a) ChatGPT- is a chatbot launched by OpenAI, it is built on a GPT-3 which has a large language model, it is also finetuned (an approach to transfer learning) with both supervised and reinforcement learning techniques.

(b) Teal- is a one place to organize & manage your job search. It's like having your own personal ATS or CRM for the job search

(c) Calendly- streamline scheduling and eliminate 'back & forth'. It increases the likelihood of getting a meeting booked with someone

(d) ResyMatch- match your resume with any job description to increase your chances of landing an interview

2. Machine Vision- Examples of AI's that have the capacity to carry out these features include Automated facial recognition and Gradescope.
3. Natural Language processing- Examples of Educational AI's categorized under this branch include

(a) Presentation translator- has features that lets you add live subtitles to your presentations in PowerPoint, as you are speaking. Presentation Translator can display subtitles directly on your PowerPoint presentation in any one of more than 60 supported text languages. This feature can also be used for audiences who are deaf or hard of hearing.

(b) Grammarly- This is an artificial intelligence-based solution that help user with correct grammar usage. Grammarly goes well beyond the standard word processor grammar and spelling checks. Instead of simply flagging glaring errors, Grammarly can also offer style and usage suggestions. It helps users finetune their writing style to fit into the context to which their writing is targeted. It also helps present idea in a simpler yet communicating.

(c) Twitter Bot – A twitter bot is a particular kind of software bot that utilizes the Twitter API to manage a twitter account. This software bot is capable of carrying out tasks including tweeting, retweeting, liking, following, unfollowing, and sending direct messages to other accounts on its own. In order to use it properly, you should broadcast useful information, automatically produce engaging or imaginative material, and automatically reply to users' direct messages.

(d) Speeko – can help user practice interviewing with an AI speech coach. Also helps user get better at public speaking.

4. Robotics- some educational AI's that have the functions to perform like a robot are Padlet and smartboards.
5. Machine learning- Educational AI's that function like this include:

(a) Turn-it-in- is a service for online plagiarism detection offered by the American company Turnitin, LLC, a division of Advance Publications. It was established in 1998 and provides licenses to universities and high schools. These institutions utilize the software as a service

(SaaS) website to check submitted works for plagiarism against its database and the content of other websites. Findings can be utilized in formative evaluation to help students evaluate how to avoid plagiarism and enhance their writing, as well as to become aware of similarities with current sources. Moreover, Turnitin, LLC manages the educational website plagiarism.org and provides a similar plagiarism-detection service called authenticate for newspaper editors and book and magazine publishers. The Turnitin suite also includes the online grading and constructive feedback tools GradeMark and PeerMark (student peer-review service).

(b) Research gate- enables scientists and researchers to share papers, ask and answer questions, and locate partners through social networking.

(c) Scopus- A comprehensive, highly maintained abstract and citation database, enriched data, and connected scholarly literature from a wide range of fields are all combined in a singular way by Scopus. Scopus locates credible research fast, recognizes experts, and gives users access to trustworthy data, analytics, and analytical tools. With one database and one subscription, you can move your research, teaching, or other priorities forward with confidence.

(d) Gooru- Gooru is an online "GPS for learning" tool for material exploration, which allows the instructor dashboard includes a number of choices for quickly gauging student progress. Gooru compiles data from many sources and applies AI to calculate traits across various dimensions, including knowledge, mindsets, and talents.

(e) Web of science- is a platform with paid access that gives users access to numerous databases that contain reference and citation data from academic journals, conference proceedings, and other publications across a range of academic subjects.

Challenges of Artificial Intelligence in Education

Current comprehensive studies reveal that research in AI in Education has been largely confined to wealthy nations (Roll & Wylie, 2016). AI in Education is a topic that is under-discussed in the developing world but is an important component of a discussion about advanced technology that is built upon well-established infrastructure and knowledge ecosystems. The fear of AI replacing humans in their various fields: Every new technology just like Artificial intelligence assures in some good benefits and some grave risks. Over the years, of the major challenge of AI is the fear it will replace humans and make many people lose their jobs in future. There are different school of thought about this feeling. And these set of people with this phobia can be categorized into the following.

The Dystopians: The dystopian school of thought holds that intelligent machines will ultimately prevail in a Darwinian struggle between humans and machines. The dystopians focus mostly on the drawbacks of robotics and AI. Robots, in their vision, will perform the tedious, low-intelligent repetitious work that people find boring. However, the AI will be able to perform tasks requiring high intelligence.

The Sceptics: They claim that, especially in light of aging populations and wealth disparity, productivity growth won't lead to increases in profit or national GDPs. The skeptics contend that increasing turnover does not always translate into increasing benefits. They are also urging for

greater clarity because they think that productivity growth will not be as strong as anticipated, which might cause the economy to stagnate or even lose money relative to the investments made in AI.

Privacy Issue: As AI develops, some organizations have made ethical commitments to emphasize the value of data privacy and protection. Due to the AI's ability to scale and automate things quickly as well as the fact that notably young people (the majority of students) are not even aware of or interested in knowing how much data their gadgets are shared for free, these privacy problems have been exacerbated. People are now more susceptible to data exploitation due to the identification, tracking, and monitoring of every aspect of their lives, not just their educational history.

This merely makes it possible for your personal information to merge with a sizable data set once it has been made anonymous. Based on conclusions from other devices, AI is able to de-anonymize this data. AI may infer or forecast sensitive information from non-sensitive kinds of data using powerful machine learning techniques. For instance, it is possible to determine an individual's emotional states, such as uneasiness, confidence, melancholy, and worry, by observing their keyboard typing patterns. Even more concerning, information like location and activity data can also be used to establish a person's political beliefs, ethnic identity, sexual orientation, and even general health.

Digital Divide: Although AI has created a wealth of opportunities, it has also been a disruptive technology that threatens to widen existing gaps and divides since it is more likely to exclude the population that is already marginalized and underprivileged from AI-powered education. AI is capable of worsen digital divide in our society and this will put a wider gap in between developed education areas and education less developed area.

Poor Data system: The quality of any AI-enabled system is directly proportional to it database. Machine learning and predictive analytics with AI are made possible by a fully functional data analytics system with complete and current data. No algorithm, no matter how complex, can function successfully without the required data. The availability of data, while essential, is still insufficient. Because of this, machine learning algorithms are prone to produce misleading results when given faulty data. In fact, thorough and accurate data is a requirement for complete and accurate predictions to be made by predictive algorithms.

However, a lot of nations still have trouble gathering fundamental but important educational statistics. The UNESCO Institute for Statistics (UIS) lists numerous obstacles to effective statistical and effective data gathering, use, and analysis of educational data (UIS, 2018b). At the school level, educational data should be accessible and usable. In addition to being able to aggregate data to highlight trends that might guide policy development, a functioning data system should be able to produce studies that are detailed enough to aid educators in understanding the major problems.

Data must also take into account injustices, providing information on, for instance, learning outcomes broken down by demographic parameters like age, gender, and socioeconomic status (UNESCO, 2018). Education systems can identify the educational disadvantage that marginalized or disadvantaged communities face by producing such evaluations. However, information on underprivileged populations still has a history of being spotty or nonexistent. In 2016 UNICEF research, for instance, it was discovered that 19 of the 40 nations assessed had no data whatsoever on children with impairments. In many of the countries that did have data, the information only mentioned the child's participation in a special needs program without mentioning the nature of the child's disability.

Way Forward for Artificial Intelligence in Education

Stakeholders and policy makers who design policies in AI in education are meant to ask some key questions when preparing these policies. They need to ask questions like

(a) What infrastructure requirements in developing nations are urgently required in order to make AI in education a reality?

(b) What can we learn from past mistakes in order to create long-lasting and fair conditions for internet access rights?

(c) How might AI benefit the education given to underprivileged individuals and groups?

(d) How can digital education and AI develop more quickly in underdeveloped nations to reduce the global educational gap between affluent and poor students?

(e) What are effective AI strategies for women and girls to eliminate gender disparities?

Conclusion

The study concluded that AI is good in instructional delivery at every level as it blends instruction. It is also efficient and effective in instructional delivery. Though there are hitches that seems to show that AI has its own issues in instruction.

Recommendation

The study recommended that teachers and facilitators key into the use of AI for instructional delivery. The government and other relevant agencies should make available relevant facilities for the usage of AI as it relates to education.

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