

**Role of Artificial Intelligence in Education**

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## Abstract

Artificial Intelligence, abbreviated as AI, is undoubtedly the most flourishing and booming sector in today's world. It has spread its reach to all domains, including education. AI techniques encourage and promote more interactive and engaging learning among students. Better animated visuals through interactive learning applications help a lot in grabbing the attention of students. The cloud feature of AI in virtual learning provides the facility of revisiting the lectures and assignments days after the lessons have been taught. With the COVID-19 pandemic taking over the world and all classes being run online, AI has risen to prominence all the more. In the present scenario, artificial intelligence has an omnidirectional impact on all areas of education including the purpose, content, method, and evaluation system. The paper analyses in what way artificial intelligence has been incorporated in online studies by the educational institutions to improve learning outcomes including student grading and evaluation system, personalized and accessible learning, virtual classrooms, assistants and labs, chatbots, and proctoring. A special focus has been laid on how various video calling applications and other software having features based on artificial intelligence have become indispensable in the face of the global health threat. We then provide insight into the possibilities, pitfalls, and the overall future of AI in the education sector.

**Keywords:** Artificial Intelligence, pandemic, online, education, virtual learning

## Introduction

We are gradually heading towards a society where everything is technology-driven. This transition has been all the more accelerated with the Covid-19 pandemic breaking out in 2020 and everything being switched to the online alternatives. Education would have suffered a huge loss had it not been for online education technologies. Artificial intelligence has been put to use in the most perfect way in the field of online education. Online classes have a slight edge over the normal physical classes as the former can be taken from the safety and comfort of the learners and the educators, thus reaching out to people on a mass scale. But at the same time, there are certain drawbacks too. Online classes require much more monitoring, assistance, and interactive lessons in order to be able to hold the attention of the learners. Students always look forward to interactive classes where they do not feel saturated. Here artificial intelligence has come to the rescue. It has helped in making the online teaching platforms much more interesting and student-friendly by putting in diverse features which allow massive interactions and assistance. However, there are two sides to a coin. There are certain challenges too, like unequal access to technology, health problems due to longer screen time, and inadequate technical training to students.

## How Artificial Intelligence is being used in Education

A few ways in which artificial intelligence has found its way into online education are as follows:

### 1. Learner accessibility.

One of the advantages which online education has provided is that learning has become more easily accessible. This has been of tremendous help to those who might have struggled to attend physical classes. Online education has helped in reaching out to all age boundaries. Artificial intelligence has made learning even more accessible by using language processing

algorithms to subtitle live speech and provide virtual assistance to learners needing help in accessing course materials.

## **2. Chatbots.**

Chatbots have now become a very promising tool. They handle conversations with students and address their queries in the most appropriate way. They also have applications in language learning, and in training scenarios.

## **3. Virtual assistants.**

Like chatbots, virtual assistants aid learners and educators by answering questions and assisting them in navigating through the course material. Students can thus get their queries solved at any point of time, without any hassle.

## **4. Learning personalization.**

Artificial Intelligence technologies have become so effective that they can provide customized learning experiences to users based on their previous data inputs. For instance, if a user is a sports fan, artificial intelligence will try to offer examples of a concept being used in the context of any sport. Similarly, it could pick up on learner interests, and use them to deliver customized vocabulary words as part of a language learning program.

## **5. Anti-cheating detection.**

Artificial intelligence technologies can use a sample of a student's writing to detect idiosyncrasies, and can then extrapolate from that dataset which would help in determining whether an assignment was completed by the student or by someone else.

## **6. Virtual labs.**

Amidst the pandemic, going to schools and colleges and attending practical classes were no longer possible. Nothing can match the level of understanding in first-hand experience but artificial intelligence made things a little easier by bringing simulation-based laboratories into reality. These labs help in demonstrating the practical lessons virtually, from the safety and comfort of homes.

## **7. Virtual classrooms.**

Virtual classrooms have the perk of collective intelligence. Group learning is always the best way to learn as many brains come together and there is overall development. Virtual classrooms have made that possible using artificial intelligence. Students can share whatever they find relevant and interesting to a particular concept taught in the class. This makes learning much more fun and interesting. Artificial intelligence opens up many creative gates for both students and teachers. Teachers get the provision of setting out-of-the-box assignments for the students. The responses of the students would give the teachers an idea about their inclinations and the teachers might work on them from a very early stage.

### **8. Online video-calling platforms.**

When the functioning of the whole world came to a standstill on account of the global pandemic, we needed to find an alternative to the traditional chalk and talk teaching method. This is where the online video-conferencing platforms have come into the picture. These platforms have enabled the teachers to continue with their classes virtually. Artificial intelligence has tried to diminish the disparity between offline and online classes as much as possible by making lectures all the more interactive. Two such platforms which are widely in use and have risen to prominence amidst the pandemic are Zoom and Google Meet. We now discuss the various aspects in which these two applications use artificial intelligence to enhance student-teacher communication.

#### **Zoom**

Zoom has adopted artificial intelligence to enable better interactions. Almost every aspect of Zoom uses artificial intelligence.

•**Virtual Backgrounds:** This is one of Zoom's flagship features. Zoom provides the facility of blurring the background or replacing it with an image or a video. This ensures privacy in the meetings. A machine vision technique known as Image Segmentation identifies the subject and subtracts the background. In addition to this, there is a feature called "touch up my appearance" which applies a filter for smoothening the user's skin and reducing blemishes.

•**Video compression:** The video algorithm identifies the sections of the image which are more relevant and need more focus, and maximizes their resolution. When the network bandwidth is low, this feature focuses on the most relevant areas.

•**Audio processing:** Using Deep Learning algorithms, the application processes audio signals and improves audio quality in meetings. Toolkits like Keras, Tensorflow or PyTorch, are used to implement machine learning models like Noise Suppression, Voice Activity Detection, Speaker Recognition, Speech Enhancement, and Music Detection.

•**Live transcription:** Zoom provides the option to include live transcription of the conversation. This proves to be really advantageous to users with bad audio quality and to those working in a noisy environment. This is achieved by using several NLP (Natural Language Processing) technologies like Speech-to-Text, translation, summarization, and sentiment analysis.

•**Integration with AI assistants:** Since February 2021, users can start a Zoom meeting from their Nest Hub devices by just saying “Hey Google, Start a Zoom Call”.

## Google Meet

Google Meet has introduced several features to make the meetings more engaging and interactive. It has introduced the data saver mode which will come in handy when the user has limited or constrained mobile data. Google Meet uses artificial intelligence to autozoom in and position the participants. A new noise cancellation feature has been added which uses artificial intelligence to fade out the noise in the background. Noise cancellation on Google Meet uses a machine learning model capable of distinguishing between noise and speech.

## 9. Grammar checkers.

Artificial intelligence also finds applications in reviewing the grammar, punctuation, spelling, and readability of the text that we write. Grammarly is the most popular one currently.

## Grammarly

The artificial intelligence and machine learning algorithms that run behind Grammarly have proved to be very useful in correcting the careless mistakes that we make and also some challenging grammatical errors. Undoubtedly this online editing tool has drastically improved our writing style and made it clearer, more concise, and errorless. This tool especially comes in handy when we write an email or a formal text, where we cannot afford to make casual mistakes. Since its inception in 2009, cloud-based Grammarly has been the widely used grammar checker worldwide. The Grammarly Keyboard can be downloaded by users for their mobile devices or an extension may be added to Chrome, Firefox, Safari, Microsoft Edge. There was a switch from the subscription-only mode to the premium model in 2015 which helped in reaching out to more users. Grammarly's artificial intelligence system was originally trained with a lot of high-quality data so that it could understand what proper grammar looks like. This text corpus, i.e. the huge compiled which humans arranged for helped the algorithm to comprehend the appropriate usage of grammar, punctuation, spellings, etc., and also the difference between correct and incorrect applications. Sometimes users ignore the suggestions made by the algorithm. This only helps in making the system smarter and better. The suggestions get better and more appropriate as the system gets exposed to more text. Also, there are checks for vagueness and plagiarism which improve the writing.

Grammarly has made significant progress in improving grammar but grammatical correctness does not ensure compelling or concise writing. Hence there should be a continuous effort to improve the algorithm and the editing that it can do. Providing context-specific suggestions might be the next step.

## 10. Webinars.

Artificial intelligence technologies have reduced the costs of conferences and field trips by converting them into online mode. This also has an edge over physical conferences as sometimes it is not possible to bring distinguished personalities from abroad for the physical conference due to their time and availability constraints. But webinars have made this pretty

easy. We can now hear foreign lectures from distinguished personalities sitting at any corner of the world, without having to spend a penny. This encourages and provides the scope for cultural intermixing.

## Challenges of introducing Artificial Intelligence in Education

Undoubtedly, the use of artificial intelligence in education has several benefits. But at the same time, there are some challenges as well.

- 1. Ensuring inclusion and equity-** Not everyone is privileged enough to get access to technology. Thus, an inevitable disparity exists and it is a great challenge to ensure inclusion and equity.
- 2. Preparing students and teachers for AI-powered education-** Technological literacy has become more than a necessity for both students as well as teachers. Both the learner and the educator must be technically sound so that all the facilities provided can be fully availed and made use of.
- 3. Health problems-** Health problems have cropped up among students and teachers due to too much exposure to electrical gadgets and prolonged screen time. Also, students are becoming more prone to being socially inactive.

## Conclusion

Today we are all immersed in a world where technology is embedded in every aspect of our lives. The world is heading towards mass technification and there is an urgent need to prepare ourselves for the change. The education sector too is undergoing a revolution. The introduction of artificial intelligence in education has definitely proved to be a boon in the face of the Covid-19 pandemic. Artificial intelligence is being widely used to improve communication and interaction on online platforms. This is definitely a good alternative, but not a replacement in my opinion. There cannot be any substitute for the traditional offline teaching methods. Physical classes have more to them than just education. Learning in a



school with our peers helps in developing one's soft skills, personality, and social involvement among others. But obviously, in the years to come, this disparity will slowly get bridged to a maximum extent with the evolution of artificial intelligence.

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