

IMPACT OF ARTIFICIAL INTELLIGENCE IN EDUCATION FOR STUDENTS WITH SPECIAL NEEDS

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Paper Received On: 12 March 2024

Peer Reviewed On: 28 March 2024

Published On: 01 April 2024

Abstract

Artificial intelligence and related technological advancements have been a matter of discussion in recent times. While technology and Artificial Intelligence (AI) have already had an impact on people's lives, they have also had a broader impact on education, making it more inclusive and accessible for students with intellectual, physical, hearing, and vision impairments. The application of AI has affected more than just special needs of pupils. The present paper is on how AI has great impact on education for students with special need. With the assistance of AI-powered assistive technology, students with impairments can take part totally in educational activities and receive extra support and accommodations. AI-driven captioning and translation systems can also increase accessibility for students who speak languages other than the main language of instruction and for those who are hard of hearing or deaf. All students will have the chance to achieve if educators use AI technologies to build more accessible, collaborative, and personalized learning environments.

Keyword: Artificial Intelligence, Disabilities, Special Need Education.

INTRODUCTION

Due to advances in technology, a number of novel innovations are emerging today that are altering the workplace, particularly for those with disabilities. The 21st century has seen a rapid growth of AI applications in education, fueled by advancement in machine learning, natural language processing, and data analytics. AI-driven adaptive learning systems have emerged, contribution to personalized learning experiences that adapt to individual student needs such kind of systems can analyze student data to identify learning gaps and provide targeted interventions, promoting inclusivity by addressing diverse learning needs (Chen, et. al., 2022, Kuddus, 2022). These technologies call for a workforce with greater agility in order to adopt changes in working practices and organizational culture more quickly and to build inclusive and accessible workplaces. Artificial intelligence (AI) is rapidly transforming the landscape of education, offering new possibilities for enhancing learning experiences and promoting inclusive educational practices. As AI technologies become more intricate and accessible, educators are exploring ground-breaking teaching methodologies that influence AI to address various learning requirements and generate more inclusive learning environments (Alam, 2021, Pham & Sampson, 2022, Rane, Choudhary & Rane, 2023).

It is possible for artificial intelligence to fundamentally alter the way educators engage with students who have special needs. In addition to having a significant impact on the public and private spheres, artificial intelligence (AI) and other technologies have also had a significant impact on education, helping children with a variety of disabilities, including motor, cognitive, sensory, and learning impairments. The use of AI in the classroom has prompted educators to create inclusive and more accessible learning environments for all students. AI is revolutionizing education by providing educators with powerful tools and resources to personalize learning, develop collaboration, and improve accessibility. AI-powered systems can analyze vast amounts of data to identify patterns and trends, enabling educators to tailor training to individual student needs. Additionally, AI technologies are being used to create immersive and interactive learning experiences, such as practical reality (VR) and augmented reality (AR) applications, that engage students in new and exciting ways (Adıgüzel, Kaya & Cansu, 2023, Pratama, Sampelolo& Lura, 2023).

Globally, AI is changing the conventional educational system. There is relatively little potential for the traditional education system, which is founded on outdated concepts, to provide specialized students with an interactive learning environment. AI is providing the educational system a creative, varied, and powerful road map to enhance the teaching-learning process for both teachers and students with special needs. AI has enhanced education overall by providing specialized students with a wealth of chances through its interactive tools. According to the World Health Organization's (WHO) global report on disabilities, over a billion people worldwide are affected by some form of disability. These people don't have access to jobs, healthcare, or education. They frequently lack the resources to pursue education in order to live more independent and fulfilling lives in the absence of practical assistance equipment. The World Health Organization estimates that over 1 billion people could use one or more assistive items or technologies.

Various researches have taken place in the area of AI (AI). Would require as a part of their technology tool kit. The Benefits of AI have been acknowledged in education however, the research fraternity has started exploring its benefits for people with special needs in education. AI and Special Need Education collaborate together to enable development of individuals suffering from disabilities. Students with learning, hearing, visual and mobility impairment can seek benefits with the use of Artificial numerous case studies have established the effectiveness of AI-driven captioning, translation, and other accessibility tools in supporting students with disabilities in educational settings. For example, a study conducted at a university found that students who used AI-powered captioning tools in lectures reported higher levels of understanding and engagement compared to students who did not use the tools. Similarly, a study conducted at a high school found that students who used AI-powered translation tools to access instructional equipment in their native language achieved higher academic outcomes compared to students who did not have access to the tools (Adeoye, et. al., 2024, Odeyemi, et. al., 2024, Zdravkova, 2022).

AI and Special Need Education

Education is undergoing a change thanks to artificial intelligence (AI), which is creating new chances to improve student experiences and advance inclusive teaching methods. With its personalized and adaptable learning solutions, artificial intelligence (AI) can improve the educational experience for children with special needs. New forms of contact made available by special educational requirements are now beneficial for students receiving special education needs. Among the most successful technologies in the last few decades have been artificial intelligence (between 2001 and 2010).

AI techniques are seen to be a useful tool for raising the profile of kids with special needs. For people with disabilities, the place of work is changing quickly as a result of technological advancements such as the Internet of Things, Artificial Intelligence, Machine Learning, as well as a host of other innovations. Special education needs and disabilities, or SEND, is an abbreviation used to designate a group of children and young adults with a range of conditions, such as challenges with reading and writing, difficulties integrating socially, comprehension issues, and more.

Technology has drastically altered the globe over the past ten years and decreased computing power in every area of our daily lives. Comprehending human intelligence has been a primary goal for computer scientists. A vast number of scientists have worked in the field of artificial intelligence over the past fifty years. This is commonly defined as the research and development of intelligence agents with the capacity to comprehend their environment and take activities that increase their likelihood of success. Education and artificial intelligence intersect as a subfield of each other. The vast majority of scientists and specialists believe that AI technology can improve education.

ADVANTAGES OF AI IN EDUCATION

Nowadays, young people frequently use their tablets or cellphones for extended periods of time. This allows individuals to use AI applications to study for 10 to fifteen minutes during their free time. AI uses gesture recognition technology to help us understand the students' ease or mood during the lessons. As artificial intelligence (AI) advances, the machine can now read students' facial expressions and movements to determine whether they are having difficulty understanding the lecture and may then modify the course to make it easier for the students to follow up. AI solutions can enable those with visual or hearing impairments to participate in global classrooms.

AI-powered assistive technologies play a crucial role in addressing accessibility barriers and providing accommodations for students with disabilities. These technologies use AI algorithms to analyze and understand input from users, such as text, speech, or gestures, and generate appropriate responses or actions to support the user's needs. For example, AI powered speech recognition technologies can transcribe spoken language into text, providing real-time captions or subtitles for students who are deaf or hard of hearing. Similarly, AIpowered image recognition technologies can explain visual content, such as diagrams or charts, for students who are blind or visually impaired. Additionally, AIpowered translation technologies can translate text or speech into different languages, sustaining students who are English language learners or speak languages other than the primary language of instruction (Mohammad Abedrabbu Alkhawaldeh, 2023, Odeyemi, et. al., 2024, Okoye, et. al., 2024).

AI can expedite the educational process, assisting pupils in reaching this objective. AI can have a big impact on students' educational journeys by giving them access to the relevant courses, enhancing contact with teachers, and freeing up more time to focus on other aspects of life.

- *Customized learning*: AI has the ability to adapt course material to each student's unique requirements.
- *Virtual tutoring*: Conversational AI can help around-the-clock.
- Innovation in content: AI can give users access to a wealth of resources.
- *Administrative effectiveness*: Data analysis, grading, and administrative chores can all be automated by AI.

• *Data-driven decision-making*: AI is capable of offering predictive analytics and personalized data-based feedback.

ROLE OF AI IN SPECIAL EDUCATION

Teaching pupils with special learning requirements resulting from mental, emotional, behavioural, or physical disabilities is known as special education. For these individuals, customized educational plans are frequently necessary to address their unique learning requirements. For these varied needs, traditional classroom environments and teaching pedagogies might not always be adequate. AI-powered tools and technologies can provide personalized learning experiences, aid in skill development, and improve accessibility for students with special needs. Inclusive educational practices aim to make sure that all students, despite the consequences of their background or abilities, have access to high-quality education. AI-driven teaching methodologies offer new opportunities to promote inclusivity by providing modified support and accommodations for students with diverse learning needs (Addy, et. al., 2024, Love, H. R., & Horn, E. (2021).

AI, for example, can assist in the development of intelligent tutoring systems that adjust to the unique learning preferences and speeds of each learner. AI can aid with data collecting and analysis as well, which can help teachers better evaluate student performance and create engaging lesson plans. AI has a lot of promise for the special education sector. It can provide individualised instruction that is tailored to the particular requirements and skills of every learner. Customization has the potential to enhance learning results and promote the growth of skills.AI can improve assistive technology as well. For example, students with speech difficulties can communicate more successfully with the aid of AI-powered speech recognition software. In a similar vein, dyslexic children can receive writing assistance via AI-powered predictive text programmes. Students with disabilities often face significant challenges in traditional educational settings due to barriers to ease of understanding and inclusivity. These barriers may include physical barriers, such as unapproachable buildings or classrooms, as well as instructional barriers, such as difficult to get to learning materials or teaching methods. Students with disabilities may also face social and attitudinal barriers, such as stigma, discrimination, and lack of support from peers and educators. These challenges can create significant barriers to learning and academic achievement for students with disabilities, restraining their ability to fully participate and succeed in school (Afua, et. al., 2024, Ejairu, et. al., 2024, LopezGavira, et. al., 2021).

Artificial Intelligence can improve accessibility. For pupils who are visually impaired, AI-powered tools can convert text into speech, and for those who are hearing challenged, they can interpret speech into text. In order to find learning patterns, forecast performance, and provide individualized learning pathways, AI systems can evaluate student data. Clicking on it. For instance, "Siri" in mobiles has enabled people to access mobile applications without even actually clicking actually clicking on them. Another example from Google "Alexa" that has enabled people to ask for any information without typing on the search bar. Both these applications (Siri as well as Alexa) work on AI (speech recognition. Such applications can provide assistive services to people. Beyond these uses, artificial intelligence has a lot more potential in special education. Constant improvements in AI technology promise increasingly more creative ways to solve special education's problems.

Researchers and educators throughout the world are beginning to recognise AI's promise in special education. Special education delivery is expected to undergo substantial changes because of the technology, becoming more accessible, efficient, and individualized. *Here are some important ways how AI can support special education.*

a) Personalized Learning

- AI has the power to completely change the educational process by offering individualized learning programmes that are catered to the requirements of each learner. AI is able to assess each student's unique learning style, areas of strength and weakness, and adjust the course material based on these insights, all thanks to sophisticated algorithms and machine learning. Students with special needs, who frequently need a more individualised approach to learning, may benefit most from this method.
- With the use of AI-powered technologies, such as intelligent tutoring systems, students can advance at their own pace by receiving individualised training and feedback. Additionally, they are able to pinpoint any areas in which the student may be having difficulty and modify the course material accordingly. This degree of customisation can make learning more interesting and productive and enable special education pupils to realise their greatest potential.
- b) Assistive Technology
- AI has the potential to be extremely important in the creation of assistive technology for special schooling. These technologies, which range from AI-powered prosthetics to voice recognition software, can significantly improve the educational and daily lives of children with impairments.

• Software that can instantly translate spoken words into text can be created using artificial intelligence (AI), which will make it easier for deaf students to follow along in class.

With the advancement of these technologies, children with special needs can now access school more easily and are empowered to engage more completely in the educational process.

c) Improved Accessibility

- AI has the potential to significantly increase accessibility in special education by facilitating students with impairments' access to learning resources. AI, for instance, can be used to transform conventional textbooks into readable digital texts with customizable font sizes or audio books.
- Predictive analytics driven by AI can assist teachers in spotting possible learning barriers and offering prompt assistance. AI is able to identify kids who may be at danger of falling behind and recommend measures to help them catch up by evaluating data on behavior and performance. Better learning results and a more welcoming learning environment may result from this proactive strategy.

CONCLUSION

By harnessing the potential of AI, we can ensure that every student, regardless of their learning needs, has the opportunity to learn, grow, and thrive. The integration of AI in special education can transform the way special education is delivered, making it more personalized, effective, and inclusive. The importance of AI in special education cannot be emphasized, to sum up. Artificial intelligence (AI) has the potential to completely transform special education by enhancing accessibility, creating assistive technology, and offering personalized learning experiences. It's critical that parents, kids, and educators stay educated as we continue to investigate the possibilities of AI in this field and seize the opportunities this technology presents. AI is also changing the procedures involved in evaluation and feedback, enabling teachers to provide students more focused and fast feedback. Artificial intelligence (AI)-powered evaluation systems can evaluate student performance and offer tailored improvement recommendations, assisting in the closure of learning gaps and fostering academic achievement.

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Cite Your Article as:

Dr. Reema Rai. (2024). IMPACT OF ARTIFICIAL INTELLIGENCE IN EDUCATION FOR STUDENTS WITH SPECIAL NEEDS. Scholarly Research Journal for Humanity Science & English Language, 12(62), 14–156. https://doi.org/10.5281/zenodo.11003750