शोधभूमि

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Artificial Intelligence in Education: Possibilities and Threats

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Abstract

In fact, without the development of science and technology, no country can even imagine reaching the pinnacle of development. It can be said that science is the only light, which to illuminate anywhere, is to illuminate all places. That is why any invention in the field of science brings and has brought revolutionary changes in human life. In this context, at present the use of Artificial Intelligence in the educational field is playing an important role in the whole world as well as in India. Today artificial intelligence is being used not only in the educational field, but also in various walks of life, but there are some challenges in the context of this new emerging technology, due to which it needs to be used very carefully. In this article article researcher highlights the benefits of using artificial intelligence in the educational field and the possible challenges arising from it.

Keywords: Artificial intelligence, Al tools, Machine learning, ChatGPT, chatbots.

Introduction:

Meaning of Intelligence: Intelligence is generally defined as the ability to learn and adapt to circumstances.

Meaning of Artificial Intelligence: It is a branch of computer science. Under this, cognitive problems related to human intelligence are solved. In reality, Artificial Intelligence is just the imitation of human intelligence by machines. Presently it is progressing by leaps and bounds in the world of technology and innovation. That is why today's revolutionary era is called the era of Artificial Intelligence. Nowadays, various types of challenges and crises are being solved through artificial intelligence, but along with this, some negative aspects of it are also coming to the fore for the human society. For these reasons we need to be careful about its use.

Artificial intelligence means artificially developed intellectual ability. Through this, it is no longer impossible to communicate between machines. Speech recognition, visual perception, language identification and decision making etc. can be described under this technology.

The father of this technique is John McCarthy. This technology itself brought a revolution in the field of robotics. With its help, a computer system or robotic system is created, which is tried to operate on the basis of the same logic on which the human brain works.

Development of Artificial Intelligence:

Although John McCarthy is considered the father of Artificial Intelligence, his friends Marvin Miskie, Herbert Simon, Allen Newell, etc. also did important work in the field of Artificial Intelligence. The development of this technology began in the 1950s, but its importance began to be recognized in the 1970s. When Japan first took the initiative and started the plan called Fifth Generation in the year 1981. It outlined a 10-year program for the development of supercomputers.

Britain created a project named 'Elvi' for this. The European Union also launched a program named 'Esprit' in this context.

After that, various big companies also contributed in upgrading Artificial Intelligence.

Generally, in artificial intelligence the characteristics of human intelligence are adapted in the form of an algorithm in a computer.

Artificial Intelligence is making machines work like people like visual perception, speech recognition, imitation and decision-making skills, automation, auto mode. Moreover, from astrology to playing chess, from medicine to driving a car and beyond, all the abilities displayed by machines including computers come under the domain of artificial intelligence.

Artificial Intelligence in India:

Currently around 40-42 thousand Artificial Intelligence professionals are working in India. Bangalore city of India is a major centre of Artificial Intelligence. Here, about a thousand companies are using Artificial Intelligence in their daily work.

Efforts of Government of India in the field of Artificial Intelligence:

- ➢ The Government of India is planning to promote research, training, skills, development etc. in the field of Artificial Intelligence, Digital Manufacturing, Big Data Intelligence, Robotics, Real Time Data and Quantum Communication.
- ➢ At the G-20 summit held in Osaka in June, 2019, the Prime Minister of India highlighted the importance of digital literacy and artificial intelligence.
- ➢ NITI Aayog is preparing the outline for a National Artificial Intelligence Programme. Also, NITI Aayog is going to start a training program with Google company to change the way of doing business in the country through Artificial Intelligence.
- ➢ The Central Government has also appealed to the industry for cooperation in creating a model for Artificial Intelligence.
- ➢ To promote Artificial Intelligence, the Government of India has prepared a 7-point strategy, in which promotion of research and development in the context of this technology, attention to security, ethical, legal and social aspects etc. have been given prominent place.

Review of literature:

Yousef, Tashtoush, & Jarrah, (2023) conducted his study titled "ChatGPT: A revolutionary tool for teaching mathematics". The objective of this study was to investigate the perspectives of various stakeholders such as students and teachers on the use of artificial intelligence in mathematics teaching, especially after the launch of ChatGPT. This study was based on a qualitative case study approach. It generally involves two stages. One of which was to analyse the content of the interviews and the other to investigate the user experience. The first phase of this study found that ChatGPT is known for its superior mathematics capabilities and its ability to increase educational success by providing users with basic knowledge of mathematics and various subjects. ChatGPT can also provide extensive support to the study of geometry. Public discussion on social media is generally positive, with enthusiasm for the use of ChatGPT in teaching. The second phase of the study found that examining user experiences through the three educational scenarios revealed a variety of issues. ChatGPT lacks a deep understanding of geometry and cannot effectively correct misconceptions. The accuracy and effectiveness of ChatGPT solutions may depend on the input data and instructions given to ChatGPT. Additionally, ChatGPT is expected to become more efficient at solving increasingly complex mathematical problems. Taken together, the results of this investigation propose several avenues for research that should be explored specifically to guarantee the safe and conscientious integration of ChatGPT into mathematics education.

Hamilton, Wiliam & Hattie (2023) conducted his study titled "The future of AI in Education." Today we are living in a time where we have the highest level of education, logic, rationality and creativity. But with the rapid advancement of Artificial Intelligence, we can use it in a better way which can result in getting better results here. This can encourage us to learn and move forward. But the serious risk is that we may

become uneducated and disconnected from the driving seat in the future. Regarding artificial intelligence, we desperately need to properly assess these risks to decide collectively, are the AI upsides worth it? And should we leave it. The main objective of this paper is to reduce the possibility that we reach a destination in our sleep that we do not want and from which we cannot return.

The paper titled "Artificial Intelligence Assistant for Mathematics Education" written by Jančařík, Novotná & Michal (2023) presents partial results of a research study conducted as part of the AI Assistant for Pupils project. Universities, the non-profit sector and organizations established by the Ministry of Education are collaborating on this project. The aim of the project is to create an AI assistant to communicate with teachers and students. In the presented study, one of the few researches has been focused on. The main objective of the presented study was to design and experimentally test the possibility of using a series of pre-prepared mathematics problems of increasing difficulty for individual practice of algebraic expressions. This topic was chosen because it is relatively well structured and therefore suitable for this method of processing. Here students can decide what difficulty of the task they want to solve and what support materials they want to use. This developed application is currently in testing mode for use by students.

M, M. S. (2024, January 2) conducted a study on the topic titled "Artificial Intelligence - A Boon or a Bane". According to him, technology is the application of conceptual knowledge to accomplish practical purposes, especially in a repeatable manner. To measure computer intelligence, experts employed Alan Turing's study "Computer Machinery and Intelligence", which later became commonly known as the Turing Test. Then the term "artificial intelligence" came into light. Artificial intelligence, if applied appropriately, can prove to be a game changer that provides a more engaging, engaging, simple, efficient and personalized learning experience. Today, AI-powered robots are replacing human workers in routine and low-skilled tasks at a rate never seen before in the history of the world. While this may lead to cost savings and increased efficiency, it has also raised concerns about job displacement. The chances of increasing unemployment have increased. The presented article is just an attempt to give us information about Artificial Intelligence and to tell the possible advantages and possible disadvantages of Artificial Intelligence in education.

Hussain, Shamim, Kumar, Samanta & Sakhare (2022) conducted a study titled "The effect of the Artificial Intelligence on Learning Quality & Practices In Higher Education". He observed that recent research in the field of artificial intelligence is having a positive impact on education. Generally, AI is considered to be a curse and a boon for the education system and human intelligence. The optimistic use of AI in classrooms is being highly recommended by both teacher and student participants. They also observed that most teachers are more amenable to adopting new technological changes than students. This study supports more effective implementation of AI in further education based on generational and geographical diversity-based teacher and student perceptions.

Artificial Intelligence in Education: Possibilities and Applications:

Today we see that the use of Artificial Intelligence (AI) in the field of education is increasing rapidly. Artificial intelligence makes the learning process more effective, engaging, simple and personalized. This has increased the sources of learning. It can customize courses based on individual differences of students and provide suggestions to teachers in the form of data-based tables and graphs on student progress. Additionally, it provides 24/7 support to students through chatbots and virtual tutors. Its application tools are also improving education in language translation and analysis. However, this also brings up issues related to ethics and privacy, which need to be handled. Thus, we are seeing that artificial intelligence is bringing a revolution in the education sector. The confluence of artificial intelligence and education is contributing in improving today's education system. In fact, this A.I is opening the doors of many possibilities for both teachers and students. With the use of artificial intelligence, education is becoming more personalized, effective, engaging and accessible. Its biggest contribution can be seen in individual teaching. Each student's learning speed, prior knowledge, interests and abilities are different. By recognizing these individual differences, AI can provide appropriate learning materials and methods for each student. For example, some software can automatically adjust the difficulty of questions based on student performance, allowing students to learn according to their ability. An important use of AI in the field of education is also in teaching and assessment. AI-based tools can help teachers prepare lectures, analyse student progress, and identify their weaknesses, providing support to student teachers. The role of AI is also becoming important in the evaluation of exams and assignments. This not only saves time but also brings fairness in evaluation. With the advent of AI in education, education has become accessible to students. Students with special needs, such as the blind or hearing impaired, can receive education with the help of AI. An important advantage of this is that through language translation tools, students of different languages can understand the same content. It is said that where there are some luxuries, there are also some difficulties. Here too, the use of AI is raising some challenges, such as questions related to data privacy and ethics. But with efforts in the right direction, this confluence of AI and education can completely change the face of education in the future, making education more inclusive, accessible, simple, personalized, accessible to all, and effective. Now let us discuss some of its possibilities.

- It is very important in the field of education, because it makes tasks like teaching management easier.
- It helps in operation of grading system and saves time.
- Even the most complex software can be understood with its help. Due to which the expenditure of resources and time can be reduced.
- The use of technology like robotics and virtual reality changes the way teaching and learning work, leading to revolutionary changes.
- The use of this technology is proving to be very good for organizing and managing data of various types of academic and educational research.

- Nowadays artificial intelligence is being used to develop digital content, interactive quizzes, reels and video tutorials etc.
- Currently artificial intelligence is helping teachers save time and resources by automating day-to-day tasks.
- Applications based on artificial intelligence like tutors and chatbots are available 24/7, which neither sleep nor forget and are ready and willing to help students anytime.
- Artificial Intelligence is inviting students and teachers to connect globally and utilize shared resources.
- AI based system allows students to self-assess their skills and knowledge.
- In this way we are seeing that all these benefits together seem to be paving the way for a new revolution in the field of education.
- In today's time, AI is working as virtual teaching assistants, which has proven helpful in answering questions, explaining topics and guiding students.
- AI-based educational games and interactive learning tools are making the learning process interesting and fun for students.
- AI is providing smart content to students in their preferred medium (video, text, audio, PDF).
- AI also helps in organizing group learning activities.
- AI technologies help students facing learning difficulties by providing visual and auditory aids.
- Tools based on AI applications provide study material according to the individual needs and abilities of students, thereby improving the speed and quality of learning.
- AI educational platforms automatically adjust the learning path according to the students' performance.
- Some applications based on AI like chatbots and virtual tutors are working to clear the doubts of the students by answering their questions instantly thereby continuously increasing their learning outcome.
- Nowadays, applications based on AI are automatically evaluating the exams and assignments, making it easier for the teachers as well as saving their time and students are also getting instant feedback from it.
- Education content is being translated and adapted into different languages using AI, opening new doors to education for global students.
- Moreover, nowadays AI is analysing the performance data of students to identify their weaknesses and strengths, thereby helping teachers to guide them better.
- Educational tools based on AI help in automatically creating curriculum and lesson content, resulting in better content for teachers.
- In today's era, AI is working as virtual teaching assistants, which has proven helpful in answering questions, explaining topics and guiding students.
- AI-based educational games and interactive learning tools are making the learning process interesting and fun for students.
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- AI also helps in organizing group learning activities.
- AI technologies help students facing learning difficulties by providing visual and auditory aids.
- AR and VR technologies along with AI provide interactive and immersive learning experiences in education, increasing student engagement and understanding.
- The use of AI paves the way for accessible education for students facing physical or mental challenges,
- AI is helping teachers in classroom management, lesson planning and monitoring students, reducing their workload and teaching more effectively.

Following is some of the important applications of artificial intelligence in the field of education nowadays.

1. Duolingo: It is an application based on AI for language learning which is being used a lot by students nowadays.

2. Khan Academy: It uses AI to provide personalized learning experience. Its main feature is that it adapts the content according to the learning pace and style of the students.

3. Grammarly: It is a tool based on AI to improve writing, which is helping students nowadays in improving grammar, spelling and writing style.

4. **Socratic by Google:** It is an AI based search engine that helps students in doing homework and answers their questions.

5. Quizlet: An AI-based application for learning and creating flashcards and practice quizzes that optimizes the content for learning.

6. Microsoft Math Solver: This is also a good application of AI to solve mathematics problems.

7. Coursera: It provides a platform for online courses, which uses AI to recommend courses to students as per their individual differences and needs.

8. Edmodo: This application makes communication between teachers and students easier.

9. Otter.ai: This is a great application based on AI to automatically transcribe lectures or meetings.

10. Newton: This application uses AI for personalized learning.

11. AI Dungeon: It is an interactive game based on AI, which promotes story writing and creativity.

12. DreamBox: It makes mathematics education attractive. It is used for individual customization in mathematics education.

13. Carnegie Learning: Provides instruction that addresses individual differences in mathematics and language arts.

14. Smart Sparrow: Provides interactive learning experiences.

15. Alta (Knewton): This application uses AI to provide personalized learning experience in higher education.

16. Gamma AI is an Artificial Intelligence tool primarily used to simplify data analysis, text generation, and other complex tasks. Gamma AI is specifically designed to improve graphics and data presentation. It helps users to easily visualize data, create reports and analyse it.

Disadvantages of using Artificial Intelligence (AI) in Education:

It is said that where there are eases, there are also some difficulties. This also applies to the use of artificial intelligence in education. The use of artificial intelligence in education can have many benefits, but it can also have some negative effects. Let's discuss its negative effects.

- In teaching based on AI, the personal contact between the teacher and the student is reduced, eye contact is also not possible, which increases the possibility of lack of human sensitivity and understanding in the teaching process.
- Teaching based on this emphasizes on giving only correct answers to the students, thereby denying them the opportunity to develop their creative thinking and problem-solving abilities.
- One of the side effects of this is that when students become overly dependent on artificial intelligence, they become dependent on technology instead of thinking, analysing and working hard on their own.
- The confidentiality of students' personal data remains at risk due to AI systems.
- It can also be feared that the jobs of teachers and other educational staff may be replaced by AI in the future, which may reduce employment opportunities.
- Artificial intelligence can only give the information it has. It is sometimes unable to answer students' complex questions or gives wrong answers.
- It is unable to understand and deal with emotions, due to which artificial intelligence can have a negative impact on the emotional and mental development of students.
- High-quality artificial intelligence systems can be expensive to implement, making it difficult for economically weaker organizations to take advantage of them.
- Possibly, when students receive education from AI, they may lack intrinsic motivation to study.
- Due to expensive devices, not all students have equal access to AI technology, which can increase inequities in education.
- Excessive use of AI in students may have a negative impact on essential life skills, such as problem-solving and decision-making abilities.

- Lack of self-reliance and creativity of students
- Issues related to security and confidentiality of the data collected here can be serious, leaving personal information of students vulnerable.
- AI provides various learning platforms thereby replacing the teacher as secondary. Excessive use of AI may diminish the role of teachers, thereby weakening the relationship between teacher and student.
- Due to the secondary role of the teacher while studying with AI, students may lack the personal guidance and inspiration that they get from teacher interaction.
- Access to AI-based education tools available only to certain sections may increase economic inequality.
- AI tools sometimes also present inaccurate information or biased content.
- Generally, it has been observed that through AI, students get answers at the right time, which may cause laziness in them.
- Nowadays, AI robot teachers are teaching in schools, due to which it can be predicted that in the coming time, there may be a reduction in some teaching posts, if this happens then there will be less job opportunities for teachers. Will happen.
- There is also the possibility that AI could be used in inappropriate ways, such as for cheating in exams, which could call into question the ethics of the education system.
- Based on the above points, it can be said that it is absolutely necessary to maintain a careful balance in education with AI so that its disadvantages can be avoided and its benefits can be benefited.
- If students or teachers become too dependent on this technology then they may possibly lose their creativity.
- This technique is very expensive
- Machines with artificial intelligence do not have an emotional aspect, that is, no machine has feelings or moral values, due to which it is not able to differentiate between right and wrong.
- The risk of privacy maintenance also increases in Artificial Intelligence.

Therefore, despite all these potential disadvantages, if artificial intelligence is used properly and in a balanced way, it can bring a lot of positive changes in the field of education.

Conclusion:

In today's time, the use of artificial intelligence in education is becoming a very important topic, which can be seen from the perspective of both a boon and a curse. This technology is giving rise to new possibilities in the education system. Education is becoming more personalized, inclusive, engaging, simple and accessible with the help of applications, tools and software based on artificial intelligence. On the other hand, it frees teachers from all the tasks that can be automated and allows them to spend more meaningful and creative time with students. Additionally, AI is able to identify and tailor education to students' individual needs, thereby increasing their learning speed and efficiency.

On the contrary, it also has some negative aspects. Its excessive use can weaken the human aspects of education. Can weaken socialization. The traditional relationship between teacher and student, which is based on moral education, emotional support, and personal guidance, may be weakened by AI. Spiritual values may also be negatively affected. Additionally, many issues like data privacy, cyber security and economic inequality also come to the fore, even from the economic point of view not all students and educational institutions can avail the benefits of this technology equally. Due to which there may be a danger of inequality increasing. Thus, we can say that Artificial Intelligence is the need of the present time, hence it is wise to adopt innovation by solving the challenges, which will inspire excellence and startups to move forward. As our country is progressing in the field of technology, Artificial Intelligence is a big opportunity for it and its utility should be taken advantage of in various fields of education, so that it can be easier to realize the dream of Digital India.

Despite today's challenges, Artificial Intelligence is the need of the hour, hence the need to implement internal educational programs among teachers, students etc. increases. For this, people's confidence can be increased by making the relationship with technology easier by highlighting the role of innovation along with awareness.

Using artificial intelligence in education is an advanced as well as controversial topic which is playing an important role in the education system nowadays. Artificial Intelligence has not only made the acquisition of knowledge engaging, simple and accessible, but has also provided innovative opportunities to make it even more personalized and customized. With its help, teachers are getting accurate information about students' learning habits, their progress and weaknesses, enabling them to better adapt their teaching methods.

But there is also an opposite side to it, while the use of artificial intelligence in education comes with many benefits, it also has some negative aspects. Over-reliance on AI may lack the human element in education, which is important in providing emotional understanding and inspiration. Additionally, AI may also raise data security and privacy issues, which are particularly of concern when it comes to sensitive student information.

Thus, we see that the entry of artificial intelligence in education remains controversial. On the one hand, this provides an opportunity to make the education system more efficient and effective, while on the other hand, it can also have social and moral side effects. Therefore, it is necessary to balance the use of this technology with wisdom and caution, so as to maximize its benefits and minimize its potential harms. Thus, we see that the use of artificial intelligence in education is important but we should use it in a balanced manner. By making efforts in the right direction and condition, we can bring forth promising results. Therefore, artificial intelligence should be seen as a supporting tool in education, which does not replace the role of the teacher, but makes him more effective.

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