

Critical Study of Artificial Intelligence & Its Scope in the Field of Education

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Abstract

Artificial Intelligence (AI) has a bright prospective to convert education in various ways, including personal learning experiences, automation based administrative tasks, enlightening accessibility, and providing real-time feedbacks to both concerned students & teachers. AI is going to adjust the concerned teaching strategies to increase learning outcomes of the educational institute students. High cost of the concerned tools and ethical concerns of AI is regularly preventing the educational institute to adopt in their systems. Purposeful sampling was chosen during the determination of the participants. Four target groups that include 100 persons in total have been identified regarding AI in education and 25 participants from each group viz. Academicians, Legal Experts, Technical Experts and Teachers. Results have suggested that uncontrolled, excessive and inappropriate use of mobile phone is causing social, behavioral and affective problems. There are fewer places for the teachers and more for the robots after the implementation of AI in the education. Displacement of the Jobs will be more possible in the area of teaching. AI means elimination of jobs for the persons engaged in the educational institute.

Keywords: Artificial Intelligence, Learning experiences, enlightening accessibility, Purposeful sampling.

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INTRODUCTION

In the present era, the standards in the area of education and learning have completely changed and modernized to maximum value. Path of access to research & learning have been easier. They are leaning very quickly & efficiently. Students are using smartphones to do their projects and use the available apps to gain knowledge of the different concepts and ideas. Videos, audios and websites are helping the students in their studies. AI tools are making the ideal environment for doing the different computer courses. Sharing of ideas, data, slides are easier than previously. Observations are all around present in the area of education to transform the ways of teaching from traditional to modern one and leaving the old way of writing on the blackboard. Students are inculcated to use the modern AI tools for the enhancement of the skills to make learning easier.

In continuation of technologies students are using the tools like NLP, ChatGPT and AITG according to the requirements of their needs. The remark of AI

(artificial intelligence) will bring the computer immense capabilities along with adaptation behavior including the sensors. It will enable the computer to recognize the human like behavior and functional abilities. The main aim is to bring the supercomputer interactions more robust with the human being. Use of AI (artificial intelligence) has increased in the education sector and going above and above to reach among the students. AI supported robots create joy and enthusiasm among the students in the early childhood education.

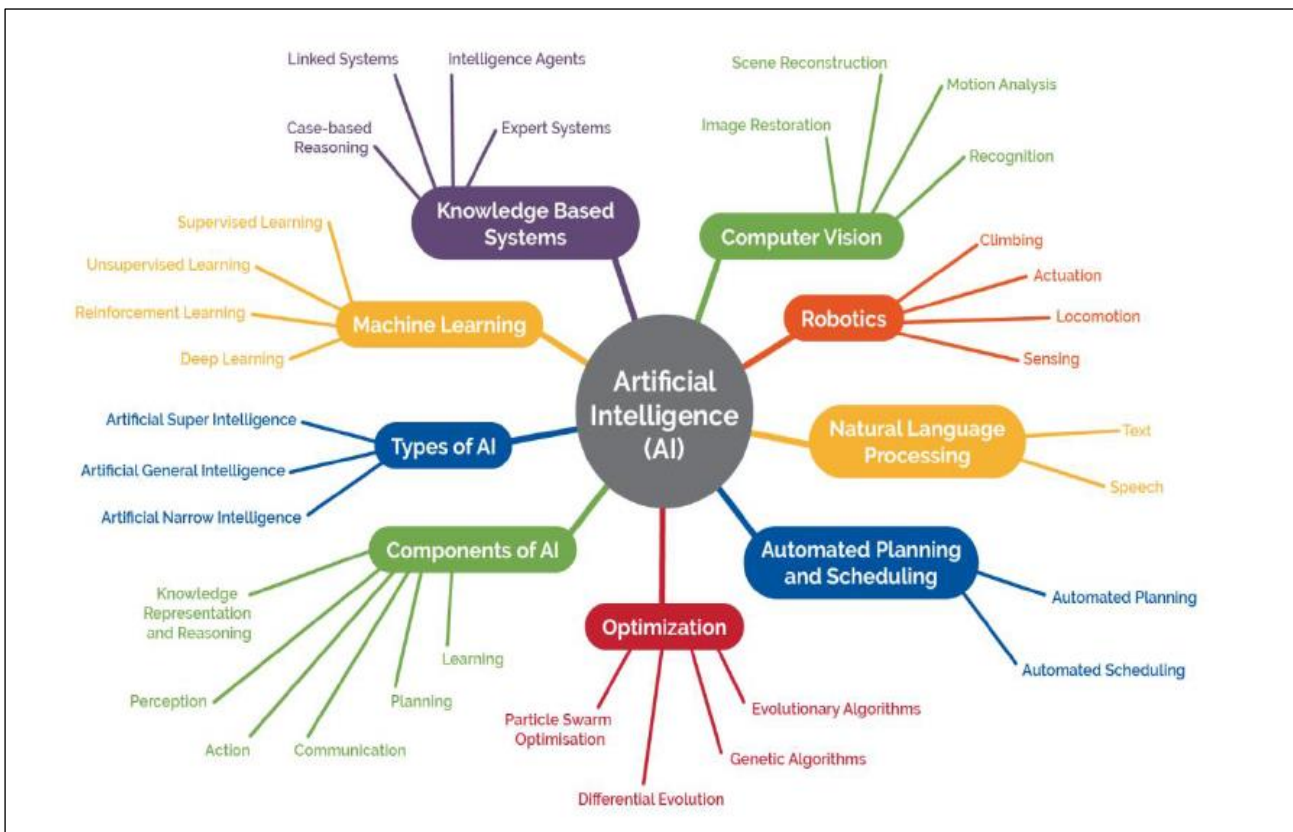
Applications of robots who are working with the teachers are teaching the students to do the routine works and doing the spelling and pronunciation activities. Web based learning and adaption on technologies are increased many folds and transitioned from simpler to complex situations in the learning. This is enriching the educational experience of the instructors and teachers. AI is also incorporated into the teaching, administration and activities of instructions and different levels of learning. Applications based on AI & systems are increasing gradually and research publications on it are publishing on different journals also increasing.

The application of AI algorithms & systems in education are increased and researchers are by the use of advanced AI techniques like data mining, deep mining etc. to have better dealing with complex issues for the customized teaching of individual students. By the use of AI in education school may have faster classes in the shorter period of time. It will require different thinking in this century than the previous one.

The assets need to be provided the abundant skills, thinking etc. It is also to be noticed that the application of AI in education need to be humans' emotions and social aspects for the policymakers and implementers of this field. Discussions will always be in future to replace teachers in the schools. Teachers with

good qualities will always be existed in future and these AI technologies will boost the intelligence, communication and creativity among the students.

Importance of artificial Intelligence (AI) has increased in the area of education and concerned roles of teachers, school and leaders will definitely change. Opinions of people of different sectors will have important role in the formulation of the policies for the implementation of AI in area of educational sectors. Different people of contrasting background have different opinions for the implementation of AI. Matter of quality and benefit, keep different areas in the implementation as per the research papers published in this filed.



AI definition by Regona et al., (2022)

Artificial Intelligence (AI) is means to express to the public as the ability of computers to think and behave and acts as humans do. It is represented to emulate the human mind and activities. Imitation of the skills & minds of the humans by the programs prepared by the experts for the welfare of the society. It is illusion for the people to think that AI will come in the purview of computer format in our homes. AI will come to our lives through different shapes, ways and functions. AI is basically new electricity of this present age and is basic building block of industrial revolution. It has powerful factor to ensure the economic development of the nation through educational up gradation. Whole progress of AI (artificial intelligence) is going to affect the many situations from social to educational aspect for the

administration and managing the classrooms of the schools. Schools are adopted the present digital age in the 21st century to boost the skills in field of AI.

India has approximately “1.10 billion mobile phone users with 692 million internet users and 931 million smart phone users and cheapest data rate in the world (\$0.17/GB) and average data speed of 18.26 mbps”. Due to these factors the AI has opened up new avenues in the educational section for smooth implementation.

LITERATURE REVIEW

Author Karsenti, T. (2019) in his research paper titled “Artificial intelligence in education: the urgent need to prepare teachers for tomorrow’s

schools” pointed out that AI will fill all aspect of our lives and the new forms of technology will fill in our lives and fascinate youths and this will make the schools to adopt this and make room for greater flexibility in curriculum activities. This study focused on the stakeholders views on the AI in reference to education and perceived the changes of it. Participants from different areas have given their views and implications regarding the AI.

Author Haseski H.I. (2019) in his research paper titled “What do Turkish pre-service teachers think about artificial intelligence” briefly stated that with the use of AI in education will create learning more individual, offer effective learning understandings, permit students to determine their capacities, progress their creativeness and diminish teachers’ workload successively. In these aspects that opposite views are also floating regarding the AI. Shifting the roles of teachers to computers is perceived as a risk in the studies on AI. Respective states and Nations are to create profiles of the concerned teachers to work on the support system of AI. Use of AI in education foresees major transformations in education systems and processes.

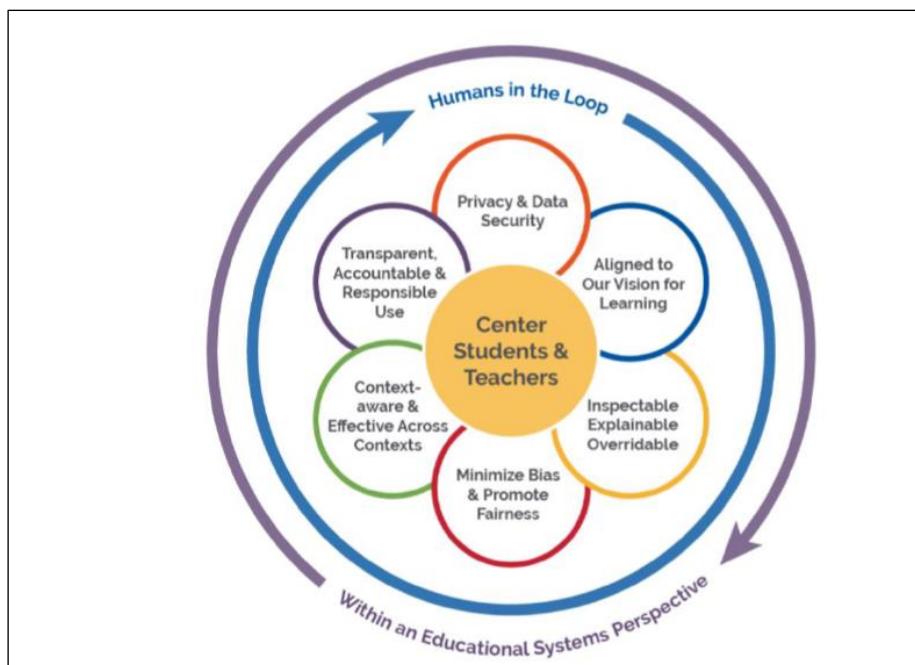
Authors Sekeroglu, B., Dimililer, K., & Tuncal, K. (2019) in their research paper titled “Artificial intelligence in education: application in student performance” opined that AI (artificial intelligence) is helping the teachers for the personalized education for the concerned students. AI (artificial

intelligence) is a better tool to provide contact to appropriate & better learning prospects for the omitted people and societies, people having disabilities, refugees, drop out students and persons living in inaccessible communities. AI has always supported the individual tailored approaches & techniques for the learning environments for the students. It is further acknowledged that with quality purpose interaction based on human teachers and AI (artificial intelligence) is very much required based on quality measured at each level based on personalization.

Authors Pedro et al., (2019) in their research paper titled “Artificial intelligence in education: challenges and opportunities for sustainable development” highlighted that a new dual type teacher model based on AI in reference to individual education for teachers as AI will help these teachers to reduce their time on the routine based works of administrative tasks. This ultimately provides teachers to concentration on students for guidance and communication.

Authors Miguel A. Cardona, Roberto J. Rodríguez Kristina Ishmael (2023) in their research paper titled “Artificial Intelligence and the Future of Teaching and Learning” opined that by the use of AI to study the diversity and multiplicity in the effective learning we need to generate different models for the broader understanding of the varieties in the education of the students. The following pictures may give wider look of AI in the education.

	Familiar Technology Capabilities	Future Technology Capabilities
Input	• Typing	• Speaking
	• Clicking and dragging	• Drawing
	• Touching and gesturing	• Analyzing images and video
Processing	• Displaying information and tasks	• Assisting students and teachers
	• Sequencing learning activities	• Planning and adapting activities
	• Checking student work	• Revealing patterns in student work
Output	• Text	• Conversations
	• Graphics	• Annotating and highlighting
	• Multimedia	• Suggesting and recommending
	• Dashboards	• Organizing and guiding



AI is increasing very rapidly and has differentiation between products and features of it in the models for the education purpose. Teachers are now give more attention to the students rather than on the routine administrative works allotted to the concerned teachers. Still improvements to teaching & learning are not correlated and not met to the satisfactory level. Educators in this field are talking these topics with the use of AI that should be safe, scalable and effective. AI based tools should be useful in the daily routine based activities for the teachers and students at the home and school as well. Risk & anxiety are also being increased in the students and teachers due to greater surveillance.

Authors Lijia Chen, Pingping Chen (2020) in their research paper titled “Artificial Intelligence in Education: A Review” suggested that AI is used in the education in different forms. The development and innovation that have concluded in computer, machine etc. having human characteristics by ultimate decision making abilities using the adaptability, learning process. AI is taking computer & computer related technologies using embedded computer systems for transformation. Curriculum of the educational institutions has been customized & personalized using AI after shifting the educators from routine work to teaching activities. This is improving the learning activities of the students. Embedded systems have permitted to use the robots in the educational institutions & chatbots to perform as teachers. It is increasing the efficiency and effectiveness of the system as it is increasing the qualities of instruction process.

Authors Suvrat Jain & Dr Roshita Jain (2019) in their research paper titled “Role of Artificial Intelligence in Higher Education an Empirical Investigation” opined that in their study in Rajasthan

state of India about AI in selected universities about the perspectives of the teachers to enhance the capacities of the learning of the concerned. This study is also revealing that future of AI in higher education is very high and prosperous but in the meantime it requires rigorous investments, time and funding. The concerned institutions are planning to adopt the AI to benefit the students and teachers through changed learning methodologies. Implementation of AI in corporate sector has already taken much more before it in the educational sectors. AI implementing institutions are frontrunners in their field and regularly getting the benefits associated with AI. AI is regularly impacting higher institute in very significant way as per the results of the study. Expansion of AI is making many jobs out-of-date and requires new skill sets for the educators and students. Regular up gradation and training are must need of the hour to have successful fight in the present era of AI.

Authors V.V. Subrahmanyam & K. Swathi (2018) in the research paper titled “Artificial Intelligence and its Implications in Education” concluded that during the last past decade the practice of hardware, software and online services have coped to bring the sufficient changes and reforms in the teaching methods and classrooms. Due to arrival of AI it will make few disruptions in the education process and sufficient changes are to be managed to streamline the things. AI is a game changer and caused unimaginable transformations in previous activities. As same as human nature AI expert system will be designed to intermingle with the world through abilities like speech recognition, intelligent behavior & visual perception. AI is most fascinating of technological advancements of the present time. AI can rapidly interpret the need of the students and design a suitable assessment. It can make a personalized

learning plan for the each student and provide a virtual teacher assistant

Research Objectives:

1. How to attain distinction in education with Artificial Intelligence?
2. How AI helps to fulfill the gap of teachers and Students ratio in educational Institutions?
3. Unemployment is the major concern of India. Is AI appropriate in this context.
4. Can AI attain comprehensive & sustainable support in education system of India

Research Method

Research paper was based on qualitative method. Qualitative research method is favored when it is chosen to examine a research problem in depth. This study was done to uncover the views of the participants in favor to the AI in education. The observations of the participants on AI in education from four different professions were studied.

Participants

Purposeful sampling was chosen during the determination of the participants. Four target groups that include 100 persons in total have been identified regarding artificial intelligence in education and 25 participants from each group:

- ❖ Academicians
- ❖ Legal Experts
- ❖ Technical Experts
- ❖ Teachers

Collection of Data and Analysis

Semi-structured interviews were engaged in this research study. The questions were sent online to the participants included “what they think of AI, how it will be integrated into education, the future outlook, the positive and negative implications they have on AI in education” along with some additional questions.

All the data were analysed using content analysis method. The aim here is to examine the data collected from all the participants as shown in Table 1.

Findings

Views of the participants were obtained on the questions asked to them and that were coded to find the outcomes. The participants emphasized outcomes, applications and outputs that will affect our lives on the arrival of Artificial Intelligence.

Outcomes

The products or outcomes that may place a prominent value in the education with the use of Artificial Intelligence may be listed as follows:

- Software for Advanced technology
- Robots for assisting teachers
- Providing Smart classes in educational institutions
- Individualized education for the concerned students
- Simulations for lessons of the students
- Systems for producing Scenario & case study
- Analysis systems for Interest, ability & needs of students
- Career guidance system
- System for taking attendance
- System for personal teaching
- Attention & distraction system
- System for academic success detection & improvement
- System for curriculum editing
- Systems for perceiving & reporting students’ learning patterns

Views of the academicians about the Artificial Intelligence were as

“Artificial intelligence in education can be used in many areas from individual learning, examination opportunities, face recognition system to taking attendance at the entrance to the class. Artificial intelligence will increase its dominance over the world. Some sort of machine-human style, mechanical-thinking individuals are waiting for us. We will not need teachers in the distant future. Artificial intelligence will take over all educational tasks; even a teacher may not be needed.”

Similarly views of the legal experts were as “Providing individualized education by virtualizing teaching through artificial intelligence.”

Technical experts stated that “Curriculum planning can be left to artificial intelligence mechanisms [tools] by developing machine learning algorithms related to the educational system”

Participants were asked the question *“How do you define AI tools in education when artificial intelligence-supported educational environments are considered Please give us a clear percent if AI is beneficial or problematic?”*

Table 1: Distribution based on benefit-drawback percentages by concerned groups

Groups	Benefit Average	Drawback Average
Academicians	% 55	% 45
Legal Experts	% 70	% 30
Technical Experts	% 96	% 4
Teachers	% 60	% 40
General	% 68	% 32

Benefits

In this theme, the results obtained from the opinions of the participants about the benefits of using artificial intelligence in education are presented. Accordingly, these benefits are:

- People measurement or measuring people
- Helping individual at learning at their own speed
- Correct determination of the individual's need
- Practical solutions to chronic problems
- No more paperwork in schools
- Prevention of waste of time
- Increase in education quality
- Providing ease of work
- Helping the right decisions with fast data analysis
- Planning teaching according to student capacity and speed
- Using or choosing effective learning methods using a learning analysis
- Ability to train in smaller groups with effective planning
- More effective individual learning process
- Helping policymakers, for example, population prediction simulations for making the right education investments in the right places

Drawbacks

After complete discussion on the topic of the research study it is found that the following are the drawbacks as listed:

1. Lacking intuitive knowledge and supports mechanical thinking
2. Pragmatic views rather than humanistic values
3. Human intervention less in education
4. Lack of data security or uncontrolled intelligence technologies
5. Destroyed social relationships
6. Information orientation human nature

An academicians suggested “As a benefit of artificial intelligence, the student’s information can be monitored, evaluated, and planning can be made about which profession that this student should focus on in the future. An AI tool can analyze the voice of students and measure how much they have learned and offer supportive or regulatory directives accordingly”. **An expert engineer** told “regular reporting of students’ situation at school, creating suggestions according to these reports and sharing with relevant people”. **A Legal Expert** said “Artificial intelligence tools can assist in evaluating the results of exams, student movements, and communication between students.”

Suggestions

Suggestions and recommendations are as follows:

- For using artificial Intelligence in the area of education, a proper controlled measurement system should be in place.

- Pilot study project should be initiated before implementation for the better results.
- For the improvement of the system, a proper academic study is required.
- Good infrastructure is created for the system.
- An audit based mechanism should be placed.
- Human psychology must be considered.
- Preventive & supportive software should be established.
- Measurement of the effects of the AI system on the decision making power of the people should be considered.
- AI solution in education should be not be comprehensive rather it should be used on the need basis.

4. CONCLUSION

The interviews of the participant suggested that AI is producing an environment of personalized learning systems for the students with the helping tools. AI will support the progress in education for the optimum learning and assisting the teachers in the regular management work. Participants in the study believed *“pervasive use of AI would lead to an overly mechanical way of information processing, pragmatic approach, much focus on the knowledge rather than the aesthetic feelings, lesser room for teachers, ethical and security-related problems, and negative social effects in relationships”*. It is suggested that uncontrolled, excessive and inappropriate use of mobile phone is causing social, behavioral and affective problems. There are fewer places for the teachers and more for the robots after the implementation of AI in the education. Displacement of the Jobs will be more possible in the area of teaching. AI means elimination of jobs for the persons concerned.

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