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## Advancement in artificial intelligence (AI) and quality education: Prospects and challenges with special reference to India

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### Abstract

Education aims at bringing desirable behaviour modification and making learning a life long process through the development of potential qualities and abilities. In order to impart education for making a better world it changes with due course of time and incorporates ideas, concepts, knowledge that are relevant. This is one of the areas that quality education wants to avail through SDG4. The recent advancement in science and technology has ushered in new possibilities and provisions for achieving quality education especially the advancement in AI like ChatGPT, the world is expecting a dynamic shift in quality education in terms of access and inclusion of learner. However, though the world is hailing AI for quality education, it might not be same for the developing countries like India. It seems to be a bit critical and complex where some allied areas need to be taken care of. This paper will try to look into those critical junctures along with the prospects that AI brings to the Indian education system aligning with SDG4 and quality education. It will also try to infer some postulates that advancement of AI will have on Indian educational scenario using secondary data.

**Keywords:** AI technology, SDG4, quality education, access to education

### Introduction

Education aims at bringing desirable behaviour modification and making learning a life long process through the development of potential qualities and abilities. It is one of the tools that facilitates knowledge, skills and attitudes. It provides opportunities to develop these that shape a country's youth (Idris *et al.* 2011) <sup>[7]</sup>. However, education is not static but dynamic (Dewey). It orients itself with the recent demands and needs of the society and try to shape and modify our behaviour in the desired direction so that aims of education can be fulfilled. In this era of 21<sup>st</sup> century, education has transformed a lot. The advancement of science and technology has contributed a lot especially the recent advancement in information and communication technology. Whereas, in the past time it was IQ (intelligent quotient) which seemed to be more important, now it has been moved to another type i.e Artificial Intelligence (AI). An AI application has the characteristics such as act intelligently like human being, simulate human brain, perform intelligent activity like human etc. (Saxena, 2022) <sup>[18]</sup>. As AI has grasped all the fields of life (Ramya & Manju, 2019) <sup>[17]</sup>, education is not an exception. It is predicted that AI's impact on education will expand (Devi, 2022) <sup>[3]</sup>. It can help in making quality education accessible (Saxena, 2022) <sup>[18]</sup>. Thus, it must be a part of the approach to quality education (Kumar, 2023) <sup>[12]</sup>.

Through addition of AI in education system has been a major concern and there has been preparation and usage of it with lots of benefits, it might not be same for all the countries. Especially for developing and underdeveloped countries it might have different impact. The addition of AI in Indian education seems to be bearing the same reference as this. Our education system has been facing a lot of other issues such as poor infrastructure, teacher training, lack of teachers, emphasis on text, commercialization etc. (Kashinathan, 2020) <sup>[11]</sup>. Moreover, the incorporation of ICT in education seems good quantitatively, but qualitatively, it doesn't seem to be effectively implemented. In such cases, entirely a new addition to AI seems critical. It might have various challenges along with prospects that need to be scrutinized.

## Methodology

This seminar paper is purely qualitative in nature and is prepared using secondary source data. The findings are critically analyzed and described.

## Objectives

### The objectives of this seminar paper

1. To review and find out prospects of AI for quality education in India.
2. To review and find out the possible challenges in the process of addition of AI in Indian education system.
3. To suggest some possible ways, through reviewing literature, in order to have successful addition of AI in Indian education system for making it a hallmark of quality.

## Findings

### Prospects in implementing AI in Indian education

Ramya & Manju (2019) <sup>[17]</sup> in “Artificial intelligence for sustainable education in India: problems and prospects” states that AI has potentiality in facilitating learning for the life, in campus and off campus experience, opening up limitless research capabilities, and, building effective institutions that can address the recent demands (Ramya & Manju, 2019) <sup>[17]</sup>. Jaiswal & Arun (2021) <sup>[8]</sup> in “Potential of Artificial Intelligence for transformation of the education system in India” have analyzed that AI is potential to both teachers and students in making learning personalized and helping both of them in adaptive assessment. Moreover there are some untapped potential of AI in Indian education such as natural language processing, emotion recognition, predictive analytics, supervised machine learning and data science (Jaiswal & Arun, 2021) <sup>[8]</sup>. Saxena (2022) <sup>[18]</sup> in his article “Role of Artificial Intelligence in Indian Education System” has discussed various advantages of using AI in Indian education system. Some of them are Individualized Education, Assistance to Teachers, Answer Sheet Evaluation, Automated Tasks, Universal Access, 24X7 learner support and tutoring etc. (Saxena, 2022) <sup>[18]</sup>. Alam (2022) <sup>[29]</sup> in “artificial intelligence (AI) and Indian education system: promising applications, potential effectiveness and challenges” has similar view. According to him, it can help in personalizing the opportunities for learning, quality content delivery, maintaining equity and equality, learning from remote areas, assisting differently abled, feedback mechanism etc. (Alam, 2022) <sup>[29]</sup>.

### Challenges in implementing AI in Indian education

Kumar (2018) <sup>[12]</sup> in “Role of Artificial Intelligence in Education systems, its challenges and opportunities in India” has discussed that AI can be a matter of challenge. It can have issues like lack of explainability, job losses, trust issues, lack of contextual awareness, lack of ethics and values etc. UNESCO (2019) <sup>[24]</sup> in its report on Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development had found out the challenges such as a comprehensive public policy on AI for sustainable development, Ensuring inclusion and equity in AI in education, Preparing teachers for AI-powered education and preparing AI to understand education, Developing quality and inclusive data systems, ethics and transparency in data collection, use and dissemination etc. Kasinathan (2020) <sup>[11]</sup> in his Making AI Work in Indian Education, has deeply discussed various issues related to implementation of AI in

Indian education. They are such as Non availability of Big Data, Contestation around ownership of data, Proprietary ownership of algorithms, Reinforcement of bias, Compromising education, Exacerbation of larger socio-economic problems etc. (Kasinathan, 2020) <sup>[11]</sup>. Devi (2022) <sup>[3]</sup> in her “Education and the Use of Artificial Intelligence “ highlights the drawbacks of implementing AI in education such as- replacement of teachers by AI, privacy concerns, expensiveness etc. Kumar (2023) <sup>[12]</sup> In “Artificial Intelligence in Education: Are we ready?” has looked into almost same concerns. He has highlighted the issue of privacy, the existential crisis of replacing teachers by AI, interactive biases etc.

## Discussions

For quality education AI seems one of the key tool. UNICEF (2000) <sup>[25]</sup> has therefore put forwarded some dimension such as healthy learner, conducive learning environment, relevant content, quality process and outcome. Dare (2005) has also given some indicators on the basis of which quality in education might be analyzed. They are- teacher ratio, class size, proportion of “specialized education teacher in the teaching staff, survival rate etc. (As cited by ED qual, 2005). From such notions, it can be concluded that quality education is that type of education that fulfils the demands of the recent times enabling the learners with advanced skills, knowledge and practices necessary for a quality world. In making Indian education system quality system AI can help in various ways. Discussions on the basis of findings under the first objectives are discussed underneath:

### Prospects of using AI in Indian education system

There are various advantages which opens up potential prospects in adding AI in Indian education system. They are as follows:

- a) It can help in universal access of education. There are various areas in India in which accessing education is still a headache. In those areas, AI can bring a drastic change and make it accessible.
- b) AI can make Indian education more inclusive than ever. Inclusivity is one of the pre requisite of quality education and with the help of AI it can be possible. AI can help to satisfy each one in their own desired way.
- c) AI can transform the approach towards individualization of Indian education system. Generally it is not possible for teachers to pay attention to each student if it is a large class. Moreover they have different types of knowledge levels and attitude levels. AI can help in tracing those and make content meaningful and interesting in that way.
- d) Quality education and quality inputs are inevitable. AI can help in providing quality contents to the learns which will in turn make them quality product. Moreover, it can also help in reducing dropouts and enhancing retention in each stages of education.
- e) AI can be one of the best ways in developing the higher order mental faculties in students. As it is advanced type of technology it can pose various problems to them according to their forte and help them dealing and solving it up.
- f) Graded learning is a major challenge in physical classrooms without any advanced technology. AI can be fruitful in transforming graded system of Indian

education. The students can pace up and ladder up according to their mental level.

### Challenges in using AI in Indian education system

However, with the whole array of prospects, addition of AI in Indian education system has also some kind of issues. It has multifaceted challenges that might hinder the path of attaining quality education. Some of them as found under the objective number two are discussed underneath:

- a) Fund is one of the major problems in Indian education system. For addition of AI, it will need a large amount of money. Already Indian educational institutions are suffering from infrastructural deficiency despite the government's relentless efforts. For arranging special addendum for AI seems a huge challenge.
- b) Trained proficient staff for using AI effectively can also be a challenge. Because in case of using ICT it is found that teachers attitude towards it is minimal. As in case of AI as it needs more forte in technology, this seems a critical space for teachers.
- c) Attitude towards using AI is another challenge. Still it is thought that teaching only through books and reference are useful. Whereas the dictums of the age have been changing, change in this attitude is still need more focus. De-structuring that negative attitude and encouraging them to use AI needs a bit strength.
- d) It might so happen that while using all the voice assistant in every content and context, using AI in each creative writing and problem solving task student and teachers become so technology dependent that the entire learning might get hampered.
- e) Using AI might create gaps. As in the case of introduction, use of implementation of new technology, there gaps between rural- urban and public-private schools, so breaching that up and balancing it for equitable access may be a matter of concern.
- f) As AI is proficient in doing multifaceted jobs in just one go, it might create unemployment in the education system also. Because one AI can solve problems in seconds be it managerial, data calculation, teaching and other mechanical stuff. So employment in education sector might get cut down which in turn can create unemployment.
- g) AI is mechanical and artificial. Though it can do many things in teaching, but the emotional aspect is still lacking. Teaching is not only learning but a lot more. What a human with a heart can do, an AI with the most advanced technology might not do. So to develop emotional aspect of students, AI can be a bit risky.
- h) Education not only aims at increasing knowledge and information. It is not only management of data and working on it. Instead, it is broader that. It tries to develop proper attitudes, values, ethics, morality in the learner to make the abled citizen. An AI with no heart and brain but only with some artificial additions seems unfit for this task.
- i) As AI is computer generated system, there is a high chance of insecurity where data of one particular institutions be it private or public get manipulated.
- j) There are many health hazards in case of ear, eyes occur in over dependence of AI technology.

### Suggestions

However, this risk areas of using AI in Indian education can

be minimized if special care to be taken. Some of such suggestive ways can be as follows:

- a) A preliminary understanding in AI and it's features should be made among all the stakeholders of education. This would create the basic awareness and the base for its usages. Moreover, it would help to avoid the potential risk it has in education.
- b) Survey should be done on the availability of the man force in education who can handle ICT well and also the attitude of all the teachers towards the new technology. Moreover, infrastructural needs and requirements to be assessed so that implementing doesn't get interrupted. Along with it, proper action plan is needed.
- c) There should be strong emphasis on formulating the goals of its use in education and setting the limit to which it can be used. This will help the stakeholders to keep away from depending it too much.
- d) AI is just an assistance and a supplement in education system. It shouldn't be let the teachers and educators replace. For that the scope of it needs to be redefined.
- e) High cyber security is expected before using AI. Because there is a potential risk for data being vulnerable in the hands of cyber crime. Thus data need to be anonymized (Kasinathan, 2020) <sup>[11]</sup>.
- f) Formulation of strong and effective policy can be antidote to the problems of using AI in education (Kumar, 2023) <sup>[12]</sup> For that a cooperation is sought among teachers, policy makers, AI experts and other concerned personals.
- g) Research in AI to be promoted so that it's threats can be reduced and strengths can be incorporated in education.

### Conclusion

To turn education into quality education is not an easy task. Because quality itself is subjective and it's concept and connotations keep on changing the way goals and aims of education do. There is no doubt that AI in Indian education will enhance quality and be a major milestone. No doubts, a long process of reviewing, rethinking and evaluation need to be undertaken. Only then the pillars of quality education be achieved and AI will be a boon for Indian education system. This will in turn make the sustainable development a real agenda than a utopia of imagination.

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