

# Role of Artificial Intelligence in Indian Education Sector

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**Abstract:** Artificial Intelligence is the most advance technology of our time. It is a smart device capable of performing tasks that normally require human intelligence. We are just at the beginning to see the possibilities of artificial intelligence in education. There is a prediction that in future participation of human teacher in classrooms would up to maintain discipline and assist Artificial Intelligence devices while machines will do the real job of teaching. In India, Gross Enrolment Ratio (GER) in schools and colleges is increasing but there is a problem of poor learning outcome and low retention rate (dropout of students). There are many factors that pose challenges to improving the quality of education like there is a single teacher for multi-grade classroom in small and remote villages where students of different grade sit in same classroom, large teacher vacancies due to uneven distribution across location, low adoption and lack of knowledge about how to use these existing technologies. Artificial Intelligence is the solution for problems like quality of education, prediction of dropouts, assessment of student needs and access issues etc. observed in Indian schools and colleges but there are some challenges in adoption of Artificial Intelligence in India, if we replace men with artificial man then there is a situation of mass unemployment because one artificial man equals to hundred men. Overall, we conclude that, today India is not ready for Artificial Intelligence because India is a developing nation and mostly depend on its human resource but future holds a lot of possibilities for Artificial Intelligence in India.

**Keywords:** Artificial intelligence, Artificial men, Dropout, Education.

**JEL CODE:** I25, O31, O32, O33

## I. INTRODUCTION

Artificial intelligence (AI) is a branch of computer science concerned with developing smart devices capable of performing tasks that normally require human intelligence, these smart devices are capable of high-level cognitive processes like

thinking, learning, perceiving, problem solving and decision making, alongside with advances in data collection, analytics and computer processing power. Artificial Intelligence has the power to enhance people's way of living and working.

In the year 1956, American Computer scientist John McCarthy coined the term AI at the Dartmouth Conference, at that time the enthusiasm for artificial intelligence was very high. In the year 1997, Deep Blue became the first Computer to beat a world chess champion Gary Kasparov. In present time artificial intelligence has developed to an astonishing level. Google, Apple and Amazon are creating Voice assistants and amazing devices like Google Assistant, Siri and Amazon's Alexa with the help of AI technology, these Voice assistants are very helpful for searching on iOS and Android mobile. In future, Artificial Intelligence will come with high intelligence.

India is the fastest growing economy with the second largest population in the world, has a significant stake in the artificial intelligence revolution. In India, school education has a substantial growth in Gross enrollment ratio (GER) but there is a low retention rate and poor learning outcome. There are many factors that pose challenges to improving the quality of education like multi-grade classroom in small and remote villages where students of different grade sit in same classroom, large teacher vacancies due to uneven distribution across location, low adoption and lack of knowledge about how to use these existing technologies. Artificial Intelligence is the solution for problems like quality of education and access issues observed in the Indian education sector. The role of artificial intelligence in education sector is continuously increasing, there is a predication that the participation of human teachers in classroom would up to assist artificial intelligence devices and maintain discipline while machines take over the real job of teaching.

NITI Aayog introduce an approach paper to set up Artificial Intelligence based cloud computing system called as AIRAWAT (Artificial Intelligence Research, Analytics and Knowledge Assimilation platform), under this the challenges associated with lack of access to computing resources would tackle by the Indian government. Cloud computing system will help teachers,

schools and colleges to provide Massive Online Open Courses (MOOC) to students who located in remote areas.

## II. REVIEW OF LITERATURE

Michael J. Timms (2016) [2] studied Letting Artificial Intelligence in Education Out of the Box: Educational Cobots and Smart Classrooms. This paper shows that Artificial intelligence in education is no more Computer and pads only, now it is mature enough to deliver in new ways, so that it can engage with students in different ways and assist teachers to teach more effectively.

Ikendinachi Ayodele Power Wogu, Sanjay Misra, Esther Fadeke Olu-Owolabi, Patrick A. Assibong and Oluwakemei D. Udoh (2018) [3] studied artificial teachers and the fate of learners in the 21<sup>st</sup> century education sector. In this paper authors provided substantial data about how artificial teachers are rising via High Level Machine Intelligence (HLMI) systems and this system is far hazardous than beneficial to learners all over the world.

V. V. Subrahmanyam and K. Swathi (2018) [4] studied Artificial Intelligence and how its implementation in Education. Artificial intelligence is the most intriguing technological advancements of our time. This paper highlighted the potential impacts of Artificial Intelligence in education, some worldwide case-studies, issues and challenges associated.

Francesc Pedro, Miguel Subosa, Axel Rivas and Paula Valverde (2019) [5] studied about artificial intelligence in education and its challenges and opportunities for sustainable development. This paper discussed about international community's role in helping bridge the digital gap between countries and possible paths and strategies to integrate artificial intelligence in education in developing countries.

Vivek V. Yawalkar (2019) [6] provides an exploratory study on artificial intelligence applications in higher education sector. This study shows how artificial intelligence applications helps in education, its applicability and challenges of artificial intelligence in education.

## III. JUSTIFICATION OF THE STUDY

Education is necessary in order to improve knowledge and way of living. Education plays a vital role in the development of human resources of a nation. With the use of Artificial Intelligence devices in classroom quality of education will improve. An effective education sector has the power to transform a nation into a developed nation. In India, there are some challenges in adoption of these technologies because people are unaware of these technologies and don't know how to use artificial intelligence devices but the expectation of the people that there should be quick services with the better results, in this order Artificial Intelligence is one of the importance device which will be help in quick services and better result. Thus,

this device is enhancing the solution of the critical problems. This device is useful in different areas like medical, education, infrastructure, IT sector, etc. We have selected this topic to find out the role of artificial intelligence and challenges in adoption of artificial intelligence in Indian education sector.

## IV. OBJECTIVE OF THE STUDY

The study has the following objectives:

- To analyze the concept of Artificial Intelligence.
- To analyze the role of Artificial Intelligence in Indian education sector.
- To find out challenges in adoption of Artificial Intelligence in India.

## V. RESEARCH DESIGN

Research design is a blueprint and plan of the proposed research work which shows how to proceed the research work by the researcher. The research paper consists of various views and opinion given by the researcher. We have taken the secondary data for this study. The sources of secondary data are:

- Working Reports,
- Research Papers,
- Discussion Papers,
- Online articles,
- Any other publish document and Internet.

This study is based on the secondary data collected from various articles, journals, research papers, discussion papers and other published data. This research is descriptive and empirical in nature. The objectives of the study which were taken for study have also been analyzed.

## VI. ROLE OF ARTIFICIAL INTELLIGENCE IN INDIAN EDUCATION SECTOR

We have seen the use of artificial intelligence technology in science fiction movies. Artificial Intelligence is no longer just contained in these movies; it's going to be a part of our day to day life and our classrooms. We are just at the beginning to see the possibilities of artificial intelligence in education. Nowadays Artificial intelligence-based voice recognition systems are booming into the market, voice recognition systems like 'Siri' by Apple, 'Cortana' by windows, 'Alexa' by Amazon and 'Google assistant' by Google. These applications become a streamline into Indian education system.

In India estimate indicates that currently half of the population is below the age of 25, the importance of a developed education sector is amplified by a large youth population. As the adoption of artificial intelligence devices increases, it is important that

these devices are effectively applied to improve education and teaching. Artificial Intelligence is primarily using in education that helps in developing skills and testing systems. The adoption of artificial intelligence in education sector is improving, but not at the pace required.

An Artificial Intelligence research and development company, Content Technologies Incorporation (CTI) develops an artificial intelligence that creates customized educational content. This technology uses deep learning to absorb and analyze existing course material, textbooks, course curriculum and creates learning materials, chapter summaries and tests.

Next Education, an EdTech company in Hyderabad, developed a machine which set question papers using artificial intelligence technology. This artificial intelligence driven platform is used by more than 50 schools in India. This machine set up papers within one minute and modify questions to each student's learning needs and gives results instantly.

The following are the implications of Artificial Intelligence in education:

- *Support for Teacher:* Artificial Intelligence provide support for teacher like grading of homework, maintaining attendance records, tests for large lecture courses, checking of multiple choice and fill in the blanks takes significant amount of time but with the help of artificial intelligence technology it can be done quickly and teachers utilize this time to interact with students, prepare for class or work on professional development.
- *Digitization of Content:* Digitization means converting text, pictures or sound into digital form that can be processed by computer, with the help of artificial intelligence books are converted into eBooks and in digital form. These eBooks are easily accessible by teachers and students through internet.
- *Give Personalized Help:* Artificial Intelligence provides personalized help to students outside of the classroom. There are many types of voice assistants available for students like Google assistant, Apple Siri and Amazon's Alexa, students can ask any question and these assistants provide answers in real time.
- *Intelligent Tutoring System:* Intelligent tutoring system (ITS) are computer systems working on artificial intelligence technology and provide learning materials to students according to their proficiency level, learning style and pace of learning. Intelligent and interactive tutoring system provide personalized instructions and feedback to users without a human teacher. It can also assess the student's level of attention.

### Dropout Percentage in India

In India, over 62% of dropout happens at school level, it's reported that both males and females mostly drop out at secondary level. About 20.4% boys and 19.2% girls stopped their studies at that level. As per report, more than 40% of girls' dropout because of domestic work and marriage, while 36.9% of boys drop out because they involve in economic activities to support their families. The dropout rate for both genders decreases as they attain higher level of education.

TABLE I: GENDER WISE DROPOUT PERCENTAGE OF PERSONS AMONG EVER ENROLLED PERSONS

Stage	Male	Female
Pre-primary	4.5	7.9
Primary	8.5	11.6
Upper-primary	16.9	18.3
Secondary	20.4	19.2
Higher Secondary	10.1	9.0
Diploma/Certificate	10.3	18.6
Graduation	5.0	5.2
Post-graduation	2.5	1.9
All	12.1	13.2

Source: National Statistical Office (NSO).

TABLE II: PERCENTAGE OF STUDENTS BY MAJOR REASONS FOR DROP OUT IN INDIA

Reason	Male	Female
Not interested in Education	18.8	14.8
Financial Constraints	24.3	17.7
Engaged in Domestic Activities	4.0	30.2
Engage in Economic Activities	36.9	5.3
School is Far off	0.5	2.7
Unable to Cope up with studies/failure	3.8	3.4
Non-Availability of Female teacher	0	0.1
Non-Availability of Girls' Toilet	0	0.1
Marriage	0	13.2
Other	11.7	12.5

Source: National Statistical Office (NSO).

In Indian school's dropout rate is very high, Microsoft is helping in predicting dropouts in Andhra Pradesh. The Andhra Pradesh government is making efforts to bring down the dropout rate in

the state's school. An application powered by Azure Machine Learning works on specific parameters, such as gender, academic performance, teacher skills, school infrastructure and socio-economic demographics, this application uses all those data to find out predictive patterns amongst the students. The government with the help of this application has identified about 19,500 probable dropouts from government schools in Visakhapatnam district. With the help of this data, district education officials find out which student is likely to dropout and provide counselling for these students and their parents.

## VII. KEY CHALLENGES TO ADOPTION OF ARTIFICIAL INTELLIGENCE IN INDIA

India is a developing country mainly dependent on its human resources, if we replace men with artificial man then there is a situation of mass unemployment because one artificial man equals to hundred men, this is one of the most important challenges to adoption of artificial intelligence in India.

The following are some of the challenges in adoption of artificial intelligence:

- There is a lack of development environment for artificial intelligence project and research work.
- Low intensity of artificial intelligence research, lack of fundamental technologies research and its application in market.
- There is a less availability of artificial intelligence expertise, experienced manpower and skilling opportunities.
- It's clear that artificial intelligence technology is expensive due to its high resource cost and maintenance. Only the well-funded schools and colleges are able to adopt artificial intelligence technology.
- Unclear privacy, security and ethical regulations. In India there is no separate law for data protection.
- Lack of advance infrastructure and advance IT knowledge in Indian schools and colleges.
- Digitalization rate in India is slow that affect the adoption of AI technology.

## VIII. CONCLUSION

30 years ago, no one thought that the technology will develop at that level. Now technology became an essential part of human life, we can see around ourselves we are surrounded with technologies. Artificial Intelligence is the most advance technology of our time and capable of performing tasks that normally require human intelligence. Artificial Intelligence can quickly assess the student's needs and provide an appropriate

assessment, increases the quality of education, predict dropouts, provide personalized help to students and helps teacher in grading homework and tests etc. Nowadays students attract to these latest Artificial Intelligence technologies. Artificial teacher makes classroom learning interesting and attractive, it generates student interest towards studies.

In India, over 75 crore people using smartphones with latest technologies, these smartphones are equipped with artificial intelligence applications and voice assistants like Siri, Google Now, Alexa, etc. These applications are useful for searching anything and provide search results within a blink of an eye. In today's world students are attracted to latest technologies and wanted to use these technologies. Artificial Intelligence can easily assess student's needs and provide appropriate help to them and it also supports parents by involving them in the student's learning environment and provide necessary information to help their child be successful when they are not in the classroom.

Government of India introduced a New Education Policy (NEP) 2020, in this government is trying to include necessary technical knowledge at all levels of education, such as digital library, coding and computational thinking through the teaching of contemporary subjects such as Artificial Intelligence and design thinking.

But here the question arises that "Is India ready for artificial intelligence?" India is still a developing nation with second highest population in the world and mainly dependent on its human resource. The answer for that question is 'today India is not ready for artificial intelligence, but future holds a lot of possibilities for artificial intelligence in India'.

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