

Artificial Intelligence may Bring Paradigm Shift in Indian Education System: The Vision for 2030



State of the Education Report for India 2022
Artificial Intelligence in Education

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According to UNESCO, “Rapid technological advancements in Artificial Intelligence (AI), as well as other advancing technologies such as robotics, cloud computing, and the Internet of Things, are transforming disciplines, economies, and industries, and challenging ideas about what it means to be human. AI has enormous potential for social good and promoting the achievement of the Sustainable Development Goals (SDGs) if it develops in a way that benefits humanity, respects global norms and standards, and is anchored in peace and development”.^[1]

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Also, the Encyclopaedia Britannica defines Artificial Intelligence as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to carry out very complex tasks—as, for example, discovering proofs for mathematical theorems or playing chess—with great proficiency. Still, despite continuing advances in computer processing speed and memory capacity, there are as yet no programs that can match human flexibility over wider domains or in tasks requiring much everyday knowledge. On the other hand, some programs have attained the performance levels of human experts and professionals in

performing certain specific tasks, so that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, and voice or handwriting recognition.^[2]

This Report, entitled State of the Education Report for India, 2022: Artificial Intelligence in Education; Here, There and Everywhere, presented the pros and cons of application of Artificial Intelligence (AI)-based tools and techniques in the Indian Education System. It is the fact that, with nearly 356 million 10–24-year-olds, India has the world's largest youth population despite having a smaller population than China, as reported by the United Nations Population Fund's (UNFPA) State of the World's Population report.³ India has more than 50% of her population residing below the age of 25 and more than 65% exist below the age of 35. Within this generation, there exist 600 million adolescent girls with specific needs, challenges and aspirations for the future. The report^[3] said 28 per cent of India's population is 10–24-year-olds, adding that the youth population is growing fastest in the poorest nations. Global number of youths is the highest ever. As the world is home to 1.8 billion young people between the ages of 10 and 24 year, 9 in 10 of the world's young population live in less developed countries. Never before have there been so many young people. Also, never again is there likely to be such potential for economic and social progress. The most pertinent question at this point is, how we meet the needs and aspirations of young people who will define our future. Being the global hub of youth, India thus needs a complete overturn of her education system to cater this huge youth population. At this juncture, the human resources in the context of implementation of AI techniques in the education sector are of utmost importance since the country has the potential to contribute maximally to the global youth population. Perhaps it is the AI-based tools and techniques that may bring the paradigm shift to the present Indian Education Sector.

In this report, it is predicted that the AI market in India is expected to reach US\$7.8 billion by 2025 at the rate of 20.2 percent compound annual growth. To make India's curriculum at par with the 21st century and to prepare the students for the AI economy, India's National Education Policy (NEP) 2020 lays insightful importance on the need to convey the necessary technical knowledge at all levels of education. It stresses the integration of AI in Education to also promote quality and skill-based education. With this Report, UNESCO offers a glimpse of the varied dimensions and suggestions for future uses of Artificial Intelligence in the school setting. The report consists of seven chapters. The first chapter gives some overviews about the report. The second chapter provides the specific context of the report. The third chapter has discussed Artificial Intelligence (AI) literacy in India. The fourth chapter outlines the opportunities that AI-powered educational

technology holds for India. Chapter 5 describes the challenges that AI-powered educational technology faces in India. The sixth chapter analyses the opportunities and the challenges and presents a conclusion as well as a vision for how responsible and human-centred application of AI could transform the education sector in India by 2030. The seventh as well as the last chapter presents conclusions and recommendations.

In this report, the authors and researchers collected data from the interviews with the experts and quantitative statistics from secondary sources. Primary and secondary information was collected from the following sources as mentioned in Page 16, under the heading.

MATERIALS AND METHODS

- Documents, reports and data available in the public domain from agencies of the Government of India, such as the Ministry of Education (MoE), the National Institution for Transforming India (NITI) Aayog, the Central Institute of Educational Technology (CIET), etc., and international organizations such as UNESCO.
- National and international policy documents.
- International peer-reviewed journal articles.
- Online and in-person interviews with different stakeholders (policy-makers, AI experts and experts from government agencies and industries).

The comprehensive list of sources of information is incorporated in the Chapter entitled References (P.116 -124). The temporal analysis of the references shows that the same ranged from the year 2001 to 2022, though very few sources published before 2000 have been noticed. But no mention about the time span of references is found in the Methodology section, which is a shortcoming for a report. The temporal analysis of sources of information is an important component of any report that also justifies the recentness and updated nature of information.

The overviews of the first chapter state the aim of this report and its recommendations. The main objective of it is to promote and provide guidance towards the responsible and human-centric application of Artificial Intelligence in Education (AI in Education) in India, which may be done by executing its SWOT analysis, which is the analysis of strength, weakness, opportunities and threat. At first, this report provides an introduction to AI, to elucidate the subject that has endured various misconceptions. It is true that nearly all existing subjects have to face so many misconceptions and misinterpretations over its journey and the same trend is repeated here. But this report has not categorised the said misconceptions and misinterpretations to enumerate the same, which might strengthen the SWOT analysis. However,

various challenges of the Indian education sector are pointed out here and it is assumed that applications of AI may assuage such challenges. Thereafter, it presents a thorough description of the theoretical background of all aspects of AI in Education, accompanied by a variety of case studies from India. The major aspects of AI literacy in India are discussed here. The possibilities of introducing AI as a distinct subject in the country's curricula are also deliberated here. This report concludes with ten key recommendations, which are:

1. Consider the ethics of Artificial Intelligence in Education as an utmost priority.
2. Rapidly provide an overall regulatory framework for Artificial Intelligence in Education.
3. Create effective public-private partnerships.
4. Ensure that all students and teachers have access to the latest technology.
5. Expand AI literacy efforts.
6. Attempt to correct algorithmic biases and the resulting discrimination.
7. Improve public trust in Artificial Intelligence.
8. Request the private sector to better involve students and educationists in developing AI products.
9. Place ownership of data with the students.
10. Embrace the versatility of Artificial Intelligence in Education systems.

In an optimistic view, these recommendations may catalyse India's transformational journey through technological education and advanced tech-driven solutions in the educational processes. This report addresses one of the 17 Sustainable Development Goals (SDGs) 4 of the 2030 Agenda for Sustainable Development, (SDG 4), which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Now, Artificial Intelligence (AI) is not specifically mentioned in the 2030 Agenda, still UNESCO and many other stakeholders have acknowledged that AI and AI-powered solutions have the potential to act as enablers towards many SDGs, including SDG 4. This carries positive implications for India in particular, where the responsible and human-centred application of suitable AI systems through system-wide policy adjustments and in-depth engagement with all stakeholders may lead to long-desired equality and equity, along with improved learning outcomes.

The Government-funded education system in India is really under threat today, which is very challenging to the present-day youth for their futures. The expenditure in education in India was 1.3% of GDP in 1990-91, which escalated to 4.4%

of GDP in 2009-10. Again, it was degraded in 2021-22, when the education-expenditure Figures were far less than 3.1% of GDP. The Gross Enrolment Ratio (GER) in higher education in India is 21% during 2021, while the same Figures as 88%, 62% and 54% for USA, UK and China respectively. Thus, India is far behind the countries like China, USA and UK in respect of GER in higher education. It is very shocking that in the Indian higher education system, out of the total enrolled students, only 12.26% is enrolled at the Master's level, and 0.79% is enrolled in research. Also, the striking fact is that, among the choices of the stream, science stream enrolment is coming down in comparison with the commerce stream. The arts stream also shows a steady decline from 60% in the 1970s to 50% in 2007. Ph.D. enrolments on the other hand show a steady compounded growth rate of around 13.6% from 1981 to 2001. With regard to distribution of skill generation across various disciplines in higher education, out of the total enrolments of students, 37.09% students are in the faculty of Arts, followed by 18.64% in Science and 17.57% in Commerce/ Management during the academic year 2011-2012.^[5]

The recent COVID-19 situation harmed the education system mostly in the country. The students of the schools, colleges and the universities were the most affected among all other communities only due to COVID-19 situation, which is still lingering. The question is, how to heal up this damage in the near future? The growth of educational infrastructure in India in terms of number of colleges, universities and technical institutes is not homogeneous but more skewed towards south central, south and north west region and urban centric. Thus, the eastern part of India, hinterland and rural India lags behind. At the same time, the private and corporate schools, colleges and universities gradually outshine the Govt.-funded public institutions, which is really a threat for the huge middle- and lower-income group population. Also, there exist the tri-coloured vicious triangle at every part of the governance, i.e., red-tapeism, yellow-journalism and black-money. Extremely complicated rules and regulations along with the poor governance at every layer of the administration highly indulge the corruption, which hinders the smooth functioning and easy progress of every layer of the government. This report shows the dream for 2030, but indicated no possible way out for the achievement of the goal. The challenges and threats are pointed out here like lack of policies for AI in education, data privacy and ownership, algorithmic fairness etc. but how the complete turnover of the education system may be possible within the next eight years only in spite of so many challenges that is not understood from this report. The Tables containing various collected data are presented in this report along with the numbers of photographs of students testing features of AI in different laboratories of the country, which added worth to this report. The overall presentations of the topics are very

nice and picturesque with clarity. The proper implementation of AI in the Indian education system demands a confronting fight with the corruption that is a hard reality. This report thus portrays a rosy future, which seems as utopian idealistic, but the possible ways out for the implementations of the same are still not known.

REFERENCES

1. <https://en.unesco.org/artificial-intelligence/stories-ideas>
2. <https://www.britannica.com/technology/artificial-intelligence>
3. <https://www.unfpa.org/swp2022>
4. <https://sdgs.un.org/goals>
5. Banerjee P, Bhattacharya S, Kumar V, Mandal K, Mehra K, Pohit S, *et al.* India Science and Technology. Cambridge University Press: New Delhi. 2015;215-8.

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