

Artificial Intelligence and School Education.

Mohanish Verma

Artificial Intelligence(AI), is a concept based on machine learning and data processing. It is an algorithmic function of artificial inputs processed in a designated manner. The efficiency and outcomes are determined by the quality of data, designing of processes and monitoring of the desired results by controlling authorities. The use of AI provides immense possibilities in many areas including in school education, but must be controlled and used intelligently. Exposure to AI for younger population has more serious implications than some of the other areas where more mature handling is often possible.

Importance of AI tools

Some significant advantages¹ of using AI in schools² relate to rapid interactive learning, real-time feedback, better predictive analysis, round the clock assistance to learners and designers, improving creativity and analysis skills in shorter span and development of efficient models with large quantity and better quality data and inputs.

As per the US Department of Education report of 2023³, there are strategic reasons on focusing on the pace and direction of use of AI in school education.

1. AI may enable achieving educational priorities in better ways, at scale, and with lower costs. Many new areas could be better covered through speech recognition and new solutions generated by AI.
2. Urgency and importance arise through awareness of system-level risks and anxiety about potential future risks. For example, students may become subject to greater surveillance. Some teachers worry that they may be replaced.
3. Urgency arises because of the scale of possible unintended or unexpected consequences. When AI enables instructional decisions to be automated at scale, educators may discover unwanted consequences. Achievement gaps

¹ <https://www.gse.harvard.edu/ideas/usable-knowledge/23/07/embracing-artificial-intelligence-classroom> (last visited 25th Dec. 2024)

² <https://schoolofscholars.edu.in/blog/ai-education-in-schools> (last visited 25th Dec. 2024)

³ This report is available at <https://tech.ed.gov>

could widen and in some cases, the quality of available data may produce unexpected results.

Insights and policies

Harvard Graduate School of Education⁴ suggests that teachers must constantly use the technology and suggest modifications apart from making the students fully aware of the impending challenges of AI in learning systems. Asking the right questions and using the algorithms for positive and creativity growth has to be evolved through human face of teachers directing the use of AI in schools. AI is based on the quality and quantity of data it receives and processes. There is large possibility of bias being generated by the AI technology particularly in school education with responses of less mature and more variable mindsets.

The US Department of education⁵ has already identified some of the areas to chalk out policies and strategies to monitor and provide direction to AI in school education. Some priorities include advancing outcomes by using AI, while protecting human judgments, monitoring the quality of data in AI models for avoiding any biased evolution of systems and ensuring the pattern of AI development for checking imbalanced and inequitable development of school children.

The EU AI Act⁶, published on 12th July, 2024, has recently introduced strict norms for use and audit of AI systems in schools in order to ensure more balanced and regulated use of the models with the priority of human learning over machines. This is raising awareness amongst the genre of school educators for developing norms for checking and controlling directionless evolution of relevant AI paradigms. This Act will actually become operational from February, 2025 in multiple phases and is bound to make an impact in various sectors of activity including the education sector.

Finland is promoting AI in its primary schools⁷, with students learning to build their own AI systems. The government funds the Finnish Centre for Artificial

⁴ <https://www.gse.harvard.edu/ideas/usable-knowledge/23/07/embracing-artificial-intelligence-classroom> (Visited on 30th Dec. 2024)

⁵ Artificial Intelligence and the Future of Teaching and Learning, US Department of Education, May, 2023

⁶ <https://artificialintelligenceact.eu/implementation-timeline> (Visited 30th December, 2024)

⁷ : (Elements of AI, n.d.) (AI in Education, n.d.), (Mistic, 2023), (European Commission, n/d).

Intelligence (FCAI) with almost 10 million euros a year for AI research in education.

China has made some strides in using AI in schools. In February 2024, the Chinese Ministry of Education announced that 184 schools across China would be designated as AI education bases. These schools are charged with leading the incorporation of AI into school curricula. The country also works closely with international agencies⁸.

Several countries are establishing national policies to guide the use of AI in education⁹. For example, Australia has released an advisory framework, focusing on ethical use and accountability and Slovenia has developed a range of policies addressing data, ethics, and to strengthen human resources. Similar policies and guidelines have now also been consolidated by the EU AI Act, 2024.

Indian School System and AI

Use of AI for school education in India is at a nascent stage and also does face a lot of challenges. The subject needs to be considered on priority since future generations in India will greatly benefit from it.

Gurumurthy and Yogesh had observed that only few efforts to analyze data and use of AI have been made in India in the past. One such company developed a product called “Mindspark” claiming to have data from assessments which run into millions of tests for lakhs of students. Similarly, Government of India collects micro level data on students every year which is available on the UDISE (Universal District Information for School Education). However there was probably not enough AI infrastructure for analyzing the huge data¹⁰.

The challenges for AI in school education in India include the sudden explosion of AI models and little time to respond to variety of local factors. Developing algorithms and models often carries biases based on social challenges, variations in the nature of population and capacity of students and monitoring feedbacks for

⁸ : (Hao, 2019), (Sharma, 2024), (UNESCO Chair on AI in Education, 2023), (TIME, 2024), (Xinhua, 2023), (Miao & Holmes, 2021).

⁹ https://asef.org/wp-content/uploads/2024/11/ASEF_ClassNet17_Publication_008_SINGLE.pdf (Visited 30th December, 2024)

¹⁰ Exploring AI in Indian school education Gurumurthy Kasinathan * Yogesh K S † 20 March 2019. <https://itforchange.net/sites/default/files/2019-08/Paper-AI-and-education-Seminar-by-UOH-March-20-2019-with-abstract.pdf> (Visited 30th December, 2024)

improvements. Inadequate management of huge data generated and logistical issues have been a challenge for a country with the largest population and variety, in the world¹¹. These are challenges to be addressed by the school education sector as well as the regulating agencies on a priority basis in the immediate future. Even availability of laptops and gadgets to large sections of student population is a challenge. NITI Aayog in India has already launched several schemes for adapting AI in different aspects of school education. Rules and guidelines are being introduced in a careful and calibrated manner. NITI Aayog's Atal Innovation Mission (AIM) in collaboration with IT industry body Nasscom was launched in 2020¹². It is an artificial intelligence-based module for school students to empower youngest minds and drive innovations in the country to the next level.

Various private enterprises are already designing AI systems for specific purposes in the education sector. The Indian edutech ecosystem, with approximately 11,000 active companies, ranks as the third highest-funded globally in terms of total investment to date. UNAcademy, Upgrad, Eruditus, PhysicsWallah, Vedantu were the highest valued companies in this sector, though they were operating independently at a global level¹³. This however clearly establishes the pace and direction where the school education is headed in India. The mushrooming of new startups in the edutech sector in India has been unprecedented in the past few years. Better filtering and monitoring of models, algorithms and data will provide even better outcomes with superior AI tools in schools.

The Future

The enormity of the subject at hand is difficult to fathom. Pragmatic strategies and awareness of specific local and global surroundings can contribute towards better solutions. Affordability for the ordinary student and partnership between sectors, regions, countries will make the transition quicker and smoother. This will call for superior regulation and clear direction. EU AI Act, 2024 perhaps can be a

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<https://itforchange.net/sites/default/files/2019-08/Paper-AI-and-education-Seminar-by-UOH-March-20-2019-with-abstract.pdf> (Visited 30th December, 2024).

¹² <https://www.deccanherald.com/india/niti-aayog-partners-nasscom-to-launch-ai-based-module-for-school-students-873383.html> (Visited on 31st December, 2024)

¹³ https://www.business-standard.com/companies/news/india-s-edtech-sector-sees-30-drop-in-funding-to-215-mn-amid-slowdown-124090600742_1.html (Visited on 31st December, 2024)

beacon to follow, along with other best practices. However, it must also be ensured that AI developments are not stifled.

Social, economic and factors to retain human superiority will be essential for sustainable progress in this area. Better training and understanding by teachers is integral to effective and beneficial use of AI models.

Data monitoring and filtering is the essence of algorithms for AI models, so needs to be watched closely. Tapping the benefits and possibilities for faster and more efficient solutions for students is the most tangible benefit of AI and must be tapped in a well researched manner. This is possible through mechanisms to constant analyze and introspect models and algorithms which might get biased or corrupted with undesirable data and inputs from time to time. Auditing of models and systems will provide checks and will evolve better designs and inputs for reaping the benefits of AI in future.

AI is here to stay. It is imperative for humanity to not only adapt it for enhancing outcomes and improving quality of lives but also keep it in control with proper adoption right from the early education of citizens at school level. Proper monitoring and direction of AI use will provide best outcomes for all. Stronger policy initiatives with real-time responses by all economies will certainly help.

(The author is an ex Indian Revenue Service Officer, superannuated as Principal Chief Commissioner of Income Tax. He has various publications on issues of Public Policy, Taxation and Finance. The views are personal.)

