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Future of Work, AI and Emerging Technologies in India in reference to Education

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Abstract

India workforce is rapidly changing due AI, with high adoption rates predicted to create 2.73 million new tech employment by 2028. Although AI could threatens to automate 2-2.5 million jobs in the tech industry alone by 2035, requiring significant reskilling efforts. AI expert, data engineers, and cloud workers are in great demand as the field shifts toword hybrid AI –human collabortion. With significant backing from the national Education policy (NEP) 2020, AI is revolutioning education in India by improving individualized learning, automating administrative duties, and closely accessbility gaps. Intelligent tutoring system to enhance learning results, utilizing AI for regional language translation in text books, and incorporating AI curricula from class VI. The use of Artificial Intelligence (AI) into education has emerged as a disruptive force, altering traditional teaching and learning processes worldwide. In this study, we look at the impact of artificial intelligence on the Indian education system, focusing on its potential to address fundamental concerns such as accessibility, customisation, and educational quality. Using a descriptive research technique, we examined the current state of AI deployment in Indian schools and universities, focusing on innovative tools and practices that improve learning outcomes. The findings show how AI-powered solutions, such as adaptive learning platforms, virtual tutors, and automated administrative processes, promote personalized learning experiences while lowering educators' workload. However, the report does identify substantial impediments, such as the digital divide, infrastructure limits, and ethical concerns over data privacy. This article, which aligns AI integration with the National Education Policy 2020, emphasizes the importance of a collaborative approach involving policymakers, educators, and technology suppliers in maximizing the benefits of AI in Indian education. The study concludes with actionable recommendations for overcoming obstacles and leveraging AI's promise to improve teaching and learning in India, resulting in an equitable and future-ready education system.

Keywords – AI, India, Education, Teaching, Technology

Introduction

India is on the verge of a new age driven by Artificial Intelligence (AI), in which technology is reshaping lives and dictating the country's progress. Artificial intelligence is no longer limited to research laboratories or large enterprises. It is reaching citizens at all levels. From enhancing healthcare access in distant locations to assisting farmers in making educated agricultural decisions, AI is simplifying, smartening, and connecting our lives. It is transforming classrooms with personalized learning, making cities greener and safer, and improving public services through speedier, data-driven governance. This shift is being driven by initiatives such as the IndiaAI Mission and AI Centres of Excellence. They are increasing access to computer power, promoting research, and assisting entrepreneurs and institutions in developing solutions that directly benefit people. India's approach focuses on making AI open, inexpensive, and accessible, so that innovation benefits society as a whole.

Artificial intelligence (AI) is the capability of machines to do tasks that would ordinarily need human intelligence. It enables systems to learn from past experiences, adapt to new settings, and solve complicated problems on their own. AI analyzes information, recognizes patterns, and generates replies using datasets, algorithms, and huge language models. These systems improve in performance over time, allowThis inclusive

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vision is represented in the NITI Aayog study, AI for Inclusive Societal Development (October 2025). The paper demonstrates how artificial intelligence (AI) can empower India's 490 million informal laborers by increasing access to healthcare, education, skill development, and financial inclusion. It demonstrates how AI-powered tools may increase productivity and resilience for millions who are the backbone of India's economy. The paper also emphasizes how technology may bridge profound social and economic divisions, ensuring that the advantages of AI reach all citizens.[1]

India's current AI ecosystem –

- India's technology sector is quickly growing, with annual revenues expected to exceed USD 280 billion this year.
- Over 6 million individuals work in the technology and AI sectors.
- The country is home to over 1,800 Global Capability Centres, with over 500 of them working on AI.
- India has over 1.8 lakh businesses, with nearly 89% of new startups founded last year incorporating AI into their goods or services.
- On the NASSCOM AI Adoption Index, India has a score of 2.45 out of 4, indicating that 87% of enterprises are actively implementing AI solutions.
- Leading AI adoption industries include industrial and automotive, consumer goods and retail, banking, financial services and insurance, and healthcare. Together, they account for over 60% of AI's total value.
- A recent BCG survey found that approximately 26% of Indian enterprises have reached AI maturity at scale.

As India develops an inclusive AI ecosystem, its growing worldwide reputation indicates progress. The Stanford AI Index ranks India among the top four countries in terms of AI skills, capabilities, and policy. The country is also the second-largest contributor to AI projects on GitHub, demonstrating the strength of its development base. With a strong STEM workforce, a burgeoning research ecosystem, and a rising digital infrastructure, India is well-positioned to use AI for economic growth, societal advancement, and the long-term ambition of Viksit Bharat by 2047.[2]

What exactly is a GPU?

A GPU, or Graphics Processing Unit, is a powerful computer chip that allows machines to think faster, interpret images, execute AI programs, and perform complicated tasks more efficiently than a traditional CPU. The aim, carried out by IndiaAI, an independent commercial division of the Ministry of Electronics and Information Technology (MeitY), is to create a holistic ecosystem that stimulates innovation, encourages startups, increases data access, and ensures the responsible use of AI for the public good.

Seven Pillers of AI – [3]

1. IndiaAI Computing Pillar - This pillar offers high-end GPUs at an inexpensive price. As previously stated, over 38,000 GPUs have been onboarded. GPUs are available for a subsidized fee of ₹65/hour.
2. India AI Application Development Initiative - This pillar creates AI applications for India-specific challenges. Healthcare, agriculture, climate change, government, and assistive learning technology are among the sectors represented. Thirty applications were authorized by July 2025. Ministries and institutes collaborate to arrange sector-specific hackathons. For example, the CyberGuard AI Hackathon promotes the development of AI cybersecurity solutions.
3. AIKosh (Dataset platform)- AIKosh creates massive datasets to train AI models. It combines data from both official and non-governmental sources. The platform contains over 5,500 datasets and 251 AI models spanning 20 industries. These resources enable developers to concentrate on AI solutions rather than constructing basic modules. By December 2025, the portal had received over 385,000 visits, 11,000 registered users, and 26,000 downloads.

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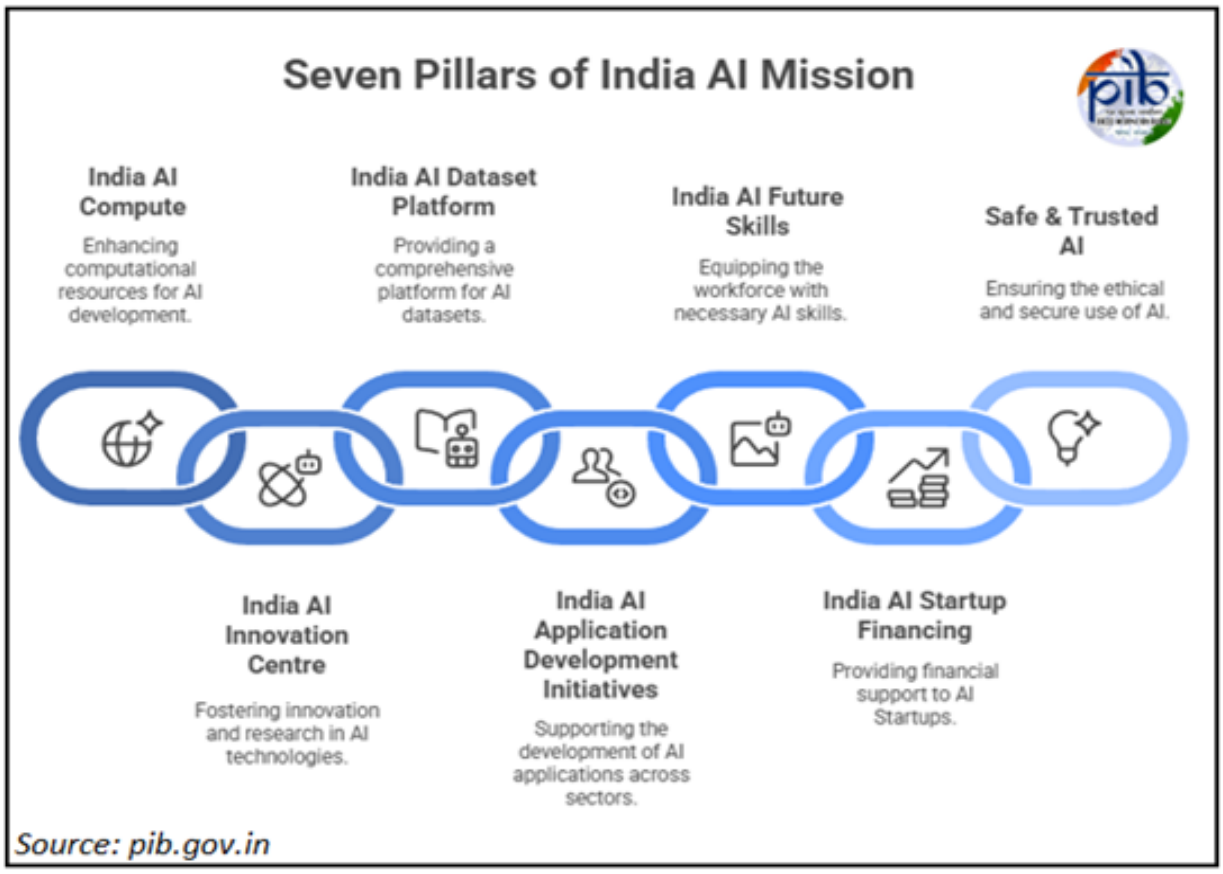
4. Models from the India AI Foundation - This pillar creates India's own large multimodal models with Indian data and languages. It secures both sovereign capabilities and global competitiveness in generative AI. IndiaAI got more than 500 proposals. In the first and second phases, twelve startups were chosen: Sarvam AI, Soket AI, Gnani AI, Gan AI, Avaatar AI, IIT Bombay consortium - BharatGen, Zenteiq, Gen Loop, Intellihealth, Shodh AI, Fractal Analytics, and Tech Mahindra Maker's Lab.

5. Future Skills of AI in India- This pillar develops AI-skilled professionals. 500 PhD fellows, 5,000 postgraduates, and 8,000 undergraduates all receive financial assistance. By July 2025, over 200 students had won fellowships, and 73 institutes were accepting PhD candidates. Data and AI Labs are being established in Tier 2 and Tier 3 cities. Thirty-one labs have been established with NIELIT and industry partners. States and universities nominated 174 ITIs and polytechnics for labs.

6. Financing for AI startups in India- This pillar gives funding to AI startups. The IndiaAI Startups Global program began in March 2025. It collaborates with Station F and HEC Paris to help ten Indian startups enter the European market.

7. AI that is both safe and trustworthy- This pillar promotes responsible AI adoption through effective governance. Expressions of Interest resulted in the selection and launch of 13 projects. They specialize on machine unlearning, bias mitigation, privacy-preserving ML, explainability, auditing, and governance testing. On May 9, 2025, an additional statement of interest was launched for partner institutions interested in joining the IndiaAI Safety Institute.



Technological Developments – Emerging technologies in India, which aims to become a $7 trillion economy by 2030, include AI, 6G, semiconductors, renewable energy, and biotechnology. The government and corporate sector are making significant investments in Digital Public Infrastructure (DPI), Quantum Computing, and Blockchain to improve industries such as healthcare, agriculture, and manufacturing.[4] We can describe this the following below-

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- AI and machine learning are widely used for automation, governance, and tailored services. The AI market is expected to reach billions, with a 1.3% potential increase in India's yearly growth rate by 2035.
- India is currently testing 6G networks and rolling out satellite internet to increase connection in remote places.
- A strong emphasis on self-reliance (Atmanirbhar Bharat) has resulted in significant investment in local chip fabrication and electronic system design.
- Sustainable computing and renewable energy sources such as green hydrogen are being scaled to support the energy shift.
- Advancements in bioinformatics and tailored medicine are revolutionizing the biotech business, which is predicted to be worth $300 billion by 2030.
- Decentralized applications (dApps) and blockchain are used to provide secure financial services and supply chain management.

Indian Education System and AI – The Indian government's education vision for Viksit Bharat 2047 is to offer an inclusive, high-quality education system that promotes skill development and life skills. Every year, India has 1.5 million schools, more than 8.5 million primary and secondary instructors, and over 260 million students enrolled in its educational system. Every year, around 40 million students enrol in over 1000 universities and 42,000 institutes. However, the Indian education system is defined by restrictive curricula, outmoded educational delivery methods, and stagnant testing patterns. This has resulted in a substantial gap between education and current employment skills. However, the introduction of artificial intelligence has changed the scenario. It helps the system transition from standardized to personalized, making it relevant and successful for the present. AI has made significant efforts to improve every area of the system, from curriculum to exam delivery. In the drive to skill Viksit Bharat 2047, these incremental adjustments are producing a paradigm shift and bringing Indian education up to par with foreign systems. We look at some of the most significant shifts.[5]

Prioritize high-value tasks for teachers - The greatest immediate impact of AI in education has been to streamline administrative duties. AI systems for Indian teachers simplify tedious duties such as grading coursework, checking attendance, and maintaining student records, giving them more time to engage with students and improve class delivery. Lesson planning and curriculum design are also experiencing drastic changes, with teachers using AI to create lesson plans that are suited to certain curricular standards or student needs. For example, Indian edtech businesses have created solutions in which students receive self-generated quizzes and examinations during courses based on a thorough understanding of a student's areas of difficulty. In addition, they provide real-time recommendations for other resources, such as reading materials.

AI for teachers offers powerful tools for automating administrative work, developing lesson plans, and personalizing learning, saving hours of preparation time. Key applications include creating quizzes, distinguishing reading materials, and delivering feedback using platforms such as Eduaide.Ai, Brisk Teaching, and ChatGPT are leading the way. These systems enable educators to focus on direct education rather than laborious paperwork. Brisk is a trusted AI platform that personalizes learning materials, generates feedback, and adapts to student needs—all within the Google and Microsoft platforms you regularly use.[6]

AI for Educators - AI for educators improves teaching efficiency and student engagement by offering capabilities such as individualized learning, automated grading, lesson preparation, and content development. Quizzes, adapting education for distinct learners, and delivering real-time feedback are among the key applications. Popular tools include ChatGPT, Microsoft Copilot, Google Gemini, and Eduaide.Ai and Brisk Teaching let you save time on administrative responsibilities. Investigate the possibilities of artificial intelligence (AI) in education. It provides a brief history of AI, large language models (LLMs), generative AI, rapid engineering, responsible AI use, and classroom applications. Dive into the art of prompting to help

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learners get the most out of Microsoft Copilot and Image Creator from Designer. Discover the various ways to improve teaching and learning using AI-powered tools in Microsoft Edge browser, Word, PowerPoint, Minecraft, and more. AI can generate lesson plans, worksheets, and presentations instantaneously, saving teachers a substantial amount of time in preparation.Intelligent teaching tools and platforms modify content and pace to meet the needs of each individual student. Automated grading and AI-powered platforms can handle regular duties, freeing educators to concentrate on student interaction. AI systems provide quick feedback on tasks, allowing teachers to monitor progress and identify student strengths and problems. AI improves accessibility with real-time translation and speech-to-text capabilities.[7]

Benefits of AI in Education - AI-powered tools enable personalized learning experiences, adapting content and pace to meet individual student needs; intelligent tutoring systems, automated grading, and virtual assistants enhance both teaching efficiency and student engagement; and by analyzing learning patterns, AI can help identify struggling students early, allowing for timely intervention. Another important aspect of AI in education is its ability to increase accessibility and inclusivity. AI-powered platforms can offer real-time translations, speech-to-text functionality, and adaptive learning materials to students with disabilities. Furthermore, educators benefit from AI since it provides data-driven insights into curriculum efficacy and student achievement. As technology advances, AI has the ability to provide more egalitarian and successful educational environments worldwide. Artificial intelligence is transforming a wide range of industries, including education. The incorporation of AI into education has resulted in substantial advances that improve learning experiences, expedite administrative processes, and benefit both students and instructors in a variety of ways.[8]

- AI provides individualized learning by adapting instructional information to each student's specific needs. Artificial intelligence, using adaptive learning technology, may assess a student's strengths, weaknesses, learning rate, and preferences. This data enables AI systems to create personalized lesson plans and materials, ensuring that students receive training that is tailored to their unique learning patterns. As a result, students can learn at their own pace, which improves comprehension and retention of material.
- Artificial intelligence has the ability to offer immersive learning experiences for pupils that traditional approaches cannot. Artificial intelligence-powered technologies like virtual reality (VR) and augmented reality (AR) may imitate real-world settings and difficult concepts, making learning more participatory and entertaining. Students can use AI-powered avatars to explore historical locations, conduct virtual science experiments, or practice language skills, delivering a hands-on learning experience that improves comprehension and retention.
- AI-powered immersive learning experiences can help improve student engagement and motivation by making learning more interactive and individualized. Gamified learning platforms, powered by AI, use game elements like prizes, challenges, and leaderboards to make learning more enjoyable and competitive. Furthermore, artificial intelligence may provide immediate feedback and guidance, allowing students to remain motivated and focused on their learning objectives. By targeting individual needs and providing real-time assistance, AI helps to keep students interested and active participants.
- AI-powered educational platforms can make high-quality education more accessible to a larger audience by automating administrative tasks and offering scalable learning solutions. For instance, AI can handle routine tasks like grading assignments, scheduling, and managing student records, freeing up time for educators to focus on teaching.
- AI enables continuous evaluation and development by delivering real-time data on student learning performance and outcomes. AI can use data analytics to track student achievement, discover patterns, and indicate areas for improvement. Educators can utilize this information to improve teaching tactics, create individualized interventions, and guarantee that learning objectives are accomplished. Continuous evaluation

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allows for a proactive approach to education, in which changes can be made quickly to improve the learning experience and results.

Disadvantages of AI – The primary downsides of Artificial Intelligence (AI) are major employment displacement owing to automation, expensive implementation costs, and ethical problems such as algorithmic prejudice and deepfakes. Furthermore, AI systems lack human empathy and emotional intelligence, promote over-reliance, resulting in skill loss, and pose privacy concerns through excessive data collecting. With all of the benefits outlined above, it may seem like a no-brainer to implement AI for your organization right away. However, it is also prudent to evaluate the potential drawbacks of making such a significant adjustment. Adopting AI has numerous advantages, but some drawbacks include the cost of installation and degradation over time. [9]

- The most significant and obvious disadvantage of integrating AI is that its development might be exceedingly expensive. The cost of using AI varies depending on what you need it for. According to one estimate, the cost of a fully developed AI solution for most firms is between $20,000 to millions of dollars. The expense is offset later on when the AI is completely integrated and can assist optimize the procedure. However, the upfront expense might be scary, if not prohibitive.
- The next problem of AI is that it lacks the ability to make judgments based on emotion and inventiveness as humans do.Because of its lack of creativity, AI is unable to generate novel solutions to problems or flourish in any highly artistic profession. One scientific publication proposed that at the current stage of AI development, it can be designed to generate "novel" thoughts but not original ones. According to this article, until AI can generate novel and unexpected ideas, it will not be able to outperform humans in terms of creativity, limiting its decision-making abilities. If a corporation needs a fresh or creative solution to a problem, humans are better suited to provide it.
- This may not be as clear a disadvantage as the ones listed above. However, machines tend to decay over time. For example, if AI is put in a machine in an assembly line, the machine's components will eventually wear. And, unless the AI has a self-repairing function, it will eventually fail.Similarly, AI might become out of date if it is not trained to learn and assessed on a regular basis by human data scientists. The model and training data used to construct the AI will ultimately get old and outdated, which means that the AI trained will become obsolete as well, unless retrained or designed to learn and improve independently.
- This is yet another drawback that many people are well aware of, thanks to several headlines throughout the years. As AI grows more prevalent in businesses, it may reduce the number of available employment because AI can readily do monotonous tasks that were previously performed by humans.According to recent projections, AI will certainly create as many new jobs as it eliminates, if not more. However, you face the challenge of training humans for these new tasks or leaving them behind as technology advances.
- Similarly to the preceding argument, AI cannot naturally learn from its own experience and failures. Humans do this by nature, attempting not to make the same mistakes over and over. However, developing an AI that can learn on its own is incredibly difficult and costly. Of course, AIs have the ability to learn. Perhaps the most renowned example of this is Google's AlphaGo program, which trained itself to play Go and within three days began generating new techniques that humans had not yet considered.

Conclusios - Artificial intelligence has advanced dramatically over the last five years, and it is now having a real-world influence on individuals, organizations, and culture. The ability of computer programs to handle sophisticated language and image processing tasks, which have pushed the area since its inception in the 1950s, has substantially improved. Although the current state of AI technology falls well short of the field's primary goal of replicating complete human-like intelligence in machines, research and development teams are taking use of these breakthroughs and applying them into societally relevant applications. For example, the use of AI techniques in healthcare is becoming more common, and the brain sciences benefit from and contribute to AI advancements. Old and new businesses are investing money and time to varied degrees in order to capitalize on this progress and deliver services that scale in unprecedented ways.

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