



Use of AI in Higher Education in India

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Abstract:

AI unleashes a seismic shift in education and it is transforming the classrooms into dynamic hubs of personalized learning. AI rethinks education, making learning dynamic tailored, and accessible. The one-size-fits-all teaching days are gone. Integrating Artificial Intelligence (AI) in higher education in India presents reframing opportunities for enhancing teaching, learning, and administrative processes. This paper inspects the current scenario of AI adoption in Indian higher education institutions. The paper attempts to analyze the potential to address critical challenges such as access to quality education, student engagement, and personalized learning. The study identifies key AI-driven applications including intelligent tutoring systems, adaptive learning platforms, automated assessment tools, and AI-assisted administrative management. It try to through the light on the benefits of AI in fostering inclusivity, improving educational outcomes, and increasing operational efficiency. However, the paper also discusses the challenges faced by Indian institutions in terms of infrastructure, faculty training, and ethical considerations related to data privacy and AI biases. Finally, the paper proposes strategic recommendations for scaling AI adoption in Indian higher education, emphasizing the need for collaborative efforts among government bodies, educational institutions, and the tech industry.

Keywords: AI tools, Higher Education

Introduction:

Artificial Intelligence (AI) in higher education in India is rapidly evolving. It is playing a crucial role in transforming teaching, learning, and administrative processes in the educational institutes. AI in higher education is remolding institutions tasks of teach, manage, and support students. It is enhancing learning experiences, improving operational efficiency, and driving innovative research. AI is shaping higher education in the India in many ways. Some of the Key aspects of AI making impact on Indian higher education are disused in this research paper.

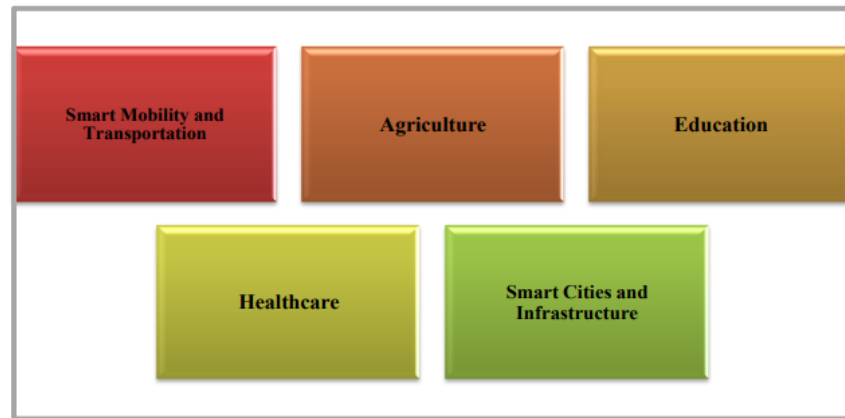
Student centered Learning: Using powered platform of AI the education can be individualized as per the personal needs. Effective tools can be used for customized

education, catering to the specific needs and learning paces of individual students. Adaptive learning platforms have algorithms that can be used to analyze students' progress. This can also be used for customize lesson plans that helps students to grasp concepts in better way. In the situations where large group of students is available in classroom then this is useful where instructors might not have the bandwidth to offer personalized attention to each student.

AI allows for highly personalized learning experiences by analyzing students' behaviors and performance. Adaptive learning platforms powered by AI assess a student's knowledge, learning style, and progress, then adjust course materials accordingly. This ensures that students

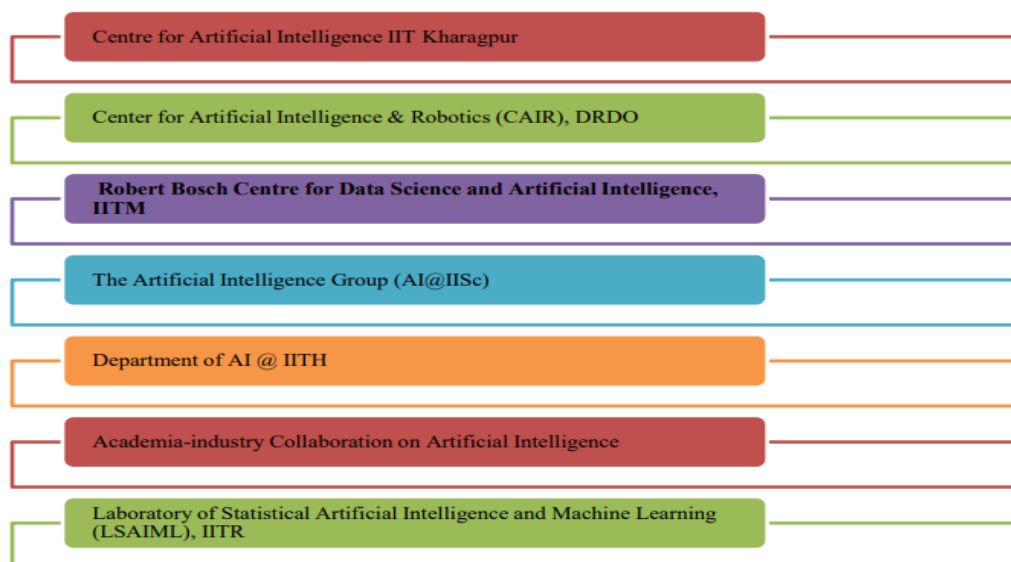
receive tailored lessons that meet their individual needs, which is particularly helpful for diverse classrooms with varying levels of ability. Knewton and Dream Box

like platforms uses AI to adjust lessons in real-time based on a student's understanding about the subject, hence making learning more engaging and effective.



Above figure sufficient to depict how AI is playing important role at present in Indian educational system

Academic Institutes and centres



Virtual Assistance:

Now a day's many universities and colleges inside the country and abroad have started using AI-based chatbots. This is becoming common to handle routine student inquiries. These are giving virtual assistants to help with some of frequently asked queries, some common questions. It provides immediate responses to students and they get satisfactory answers. Information about faculty, admission processes, schedules, course details, or even

academic advising is also provided. These systems can handle a large number of response by handling huge amount of inquiries thus improving efficiency and accessibility. AI is also used to assist students with advising about courses and helping them to ensure about requirements. This is observed that use of these system has reduced the number of drop out students due to lack of correct information and confusion over scheduling or deadlines.

Graded System:

AI can also help in automate grading. It is more suitable when evaluation is objective such as multiple-choice questions. It can be used even for some subjective cases up to some extent. This can reduce the administrative workload on educators and ensures quicker feedback for students, which can enhance the learning process. Turnitin has developed AI-driven tools to help assess student writing. It also checks for originality and coherence. It also checks for writing quality and also offers suggestions for improvement.

Smart Classrooms:

In recent days Indian institutions are adopting smart classroom technologies. In smart classroom technology AI is used to manage resources. It assist in tracking the attendance of the students. It analyzes student participation, and provide insights into classroom. In combination with tools like projectors and interactive boards it makes learning more interactive and engaging.

Many universities in the India are adopting smart classrooms, that integrate AI with IoT (Internet of Things) technologies and this is enhancing the teaching and learning experience of the students. It provides insights on how to improve the learning environment. Many government and nongovernment institutions are using AI-driven systems to create smart classrooms that track student interactions, monitor classroom dynamics, and assist in managing resources effectively.

Learning Analytics:

AI is used to collect and analyze large data this helps the universities to improve educational outcomes. Evaluated data can identify patterns and trends in student performance and it can be used to identify slow learners and fast learners so as to take corrective measures and identify students requiring additional support or interventions. AI-based learning analytics is

also used in identifying probable risk of students failing or low performing and provides targeted support to help them to stay on track. AI tools are being utilized to improve student retention by identifying students who are at risk of dropping out. Through early interventions based on predictive analytics, universities can take proactive steps to engage at-risk students and improve their chances of success.

Research and Development:

Recently development in AI is playing a significant role in advancing research across various disciplines. It is out performing in facilitating advanced research in various fields that including engineering, medicine, agriculture, and social sciences. In India universities are using AI for research purposes, for data analysis, simulation, pattern recognition, and predictive modeling. AI helps researchers to analyze large datasets and make informed decisions. It helps researchers to handle vast datasets, identify patterns, and conduct experiments in more efficient ways. AI is heavily used in fields like healthcare research as machine learning algorithms are playing vital role to analyze medical data improving diagnosis and developing new treatments. Following are some details about AI in research in India.

- India's Foundational Large Language Models: IndiaAI has launched an initiative to develop indigenous foundational AI models, including LLMs and Small Language Models (SLMs), through a call for proposals.
- Digital India BHASHINI: An AI-led language translation platform designed to enable easy access to the internet and digital services in Indian languages, including voice-based access, and support content creation in Indian languages.
- BharatGen: The world's first government-funded multimodal LLM initiative, BharatGen was launched in 2024 in Delhi. It aims to enhance public

service delivery and citizen engagement through foundational models in language, speech, and computer vision. BharatGen involves a consortium of AI researchers from premier academic institutions in India.

- Sarvam-1 AI Model: A large language model optimised for Indian languages, Sarvam-1 has 2 billion parameters and supports ten major Indian languages. It is designed for applications such as language translation, text summarisation, and content generation.
- Chitralekha: An open-source video transcreation platform developed by AI4Bhārat, Chitralekha enables users to generate and edit audio transcripts in various Indic languages.
- Hanooman's Everest 1.0: A multilingual AI system developed by SML, Everest 1.0 supports 35 Indian languages, with plans to expand to 90.

Administrative Efficiency:

Many administrative tasks can be streamlined by using AI tools. AI tools can be used for reducing paperwork and thus improving operational efficiency within universities. Using AI-driven systems admission process can be automated. AI supportive systems can be used for grade submissions, track financial aid as well. This will reduce the administrative workload and helps in improving the speed and accuracy of these processes. Many universities are using AI to streamline admissions processes which is helping staff in assessing large volumes of applications more efficiently and accurately.

AI in Data-Driven Decision Making:

Educational administrators can use AI in making data-driven decisions. It helps in, from optimizing resource allocation and identifying trends in student performance by analyzing data related to student demographics, academic history, and more, Thus universities are improving curriculum design, faculty allocation, and student retention strategies.

AI in Skill Development:

At present India's emphasis is on skilling its youth, AI tools are used in various online platforms for skill development. Students can adopt the courses based on the immediate feedback received on their learning progress, helping them to develop the necessary skills for the job market, specifically in technology-driven fields.

According to the Stanford AI Index 2024, India ranks first globally in AI skill penetration with a score of 2.8, ahead of the US (2.2) and Germany (1.9).

AI in MOOCs and Online Education:

AI is also used in Massive Open Online Courses that is MOOC like SWAYAM is improving the delivery of online education. AI tools help create adaptive learning paths for students and provide personalized recommendations. AI also enhances the student experience through real-time assessments and peer interaction analysis.

AI in Faculty Development:

AI tools are used for faculty development as well. Creating customized learning paths, teaching resources, and training modules is easy using AI. It can also analyze teaching style of faculty members and give insights into areas for improvement and recommending resources to enhance teaching techniques.

AI in Career Services:

Use of AI tools in career counseling and job placement services is playing an important role. These tools analyze student profiles such as skills, interests, and performance and based on this AI tools match them with appropriate career opportunities. AI-powered platforms such as Handshake can even provide personalized resume feedback and job interview preparation.

AI in Career Guidance:

AI systems can assist students in career planning and counseling. By

analyzing academic records, interests, skills, and job market trends, AI can provide personalized career recommendations, helping students make informed decisions about their future.

Ethics and Bias in AI:

Increased use of AI in education is growing concerns about its ethical implications, particularly around issues of bias, privacy, and fairness. Use of the algorithms used in AI systems need to be carefully monitored to avoid reinforcing existing biases, especially in grading and admissions decisions.

Despite of the advancements, the adoption of AI in Indian higher education there are many challenges that are need to be addressed. Rural or undeveloped areas are having very less infrastructure to support AI tools. Data Privacy and Security are of utmost concern as the use of AI requires large amounts of student data It also raises concerns over data privacy and security. Faculty members may raise resistance because of job security. Some educators may be feel it might undermine their role in the classroom. Trained AI educators are required in India's higher education system so as to integrate it into teaching effectively. Despite of advancements, there are many challenges in fully integrating AI into higher education in the India. Implementing AI systems can be expensive, especially for smaller institutions with limited budgets. Teachers and administrators may need training to effectively use AI tools and understand their potential benefits. With the large amounts of student data being collected, universities must ensure that they have robust security measures to protect sensitive information. It is challenge to treat diverse student populations with AI powered tools.

Conclusion:

The future of AI in Indian higher education is promising. The government is increasing focus on AI as a strategic priority. Institutions are adopting AI for improving student outcomes and streamlining administrative processes. The government's initiatives, such as the National Strategy for AI, aim to integrate AI into education and research at all levels. AI will be reshaping higher education in India over the coming years. As AI technology becomes more affordable and accessible, it is likely to be integrated more deeply into the administrative and academic functions of universities. The use of AI in research and online learning is to increase, providing students and institutions with more personalized, effective, and accessible educational experiences. AI's potential to revolutionize higher education in India is significant, and its integration is expected to grow in the coming years. It is making education more accessible, personalized, and data-driven. Higher education is driving improvements in student engagement, retention, and success as well as enhancing research, administrative tasks, and personalized learning. Challenges related to ethics, access, and training are still need to be addressed for broader and more effective adoption.

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