

Artificial Intelligence in Education: Issues & Challenges

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Abstract—Artificial intelligence (AI) refers to the use of computer systems that can perform tasks which require human intelligence to enhance learning experiences with the use of different AI technologies like image processing, deep learning, machine learning, natural language processing and robotics. These technologies acclimating content and pace to individual student needs & enhance to personalize learning.

AI systems provide customized lesson plans and resources, to ensure that students receive instruction that is suited to their individual learning styles and helps to make education more effective and engaging. There are different ways of AI learning content like project-based, game-based and collaborative learning approaches. AI in administration helps to streamlining administrative tasks. This paper analyses the application of AI in education & administrative work and also explores its positive impacts on enhancing teaching efficiency, personalized learning and supporting special education.

Index Terms—Artificial Intelligence, higher education, AI-Powered tools, personalized learning, intelligent tutoring system

I. INTRODUCTION

Artificial intelligence (AI) technology enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy. AI is an attempt to make computer think intelligently, similar to human being. The aim is to create machines which is capable of reasoning and using human language. AI assumes that machine can simulate human intelligence and can execute complex tasks. AI can create immersive learning experience to engage students with interactive teaching activities. AI uses different technology such as virtual reality & augmented reality which can simulate real-world scenarios and complex concepts, and also assist to make learning more interactive and

enjoyable. At present, the overall advancement of the new generation of AI-related disciplines, theoretical modeling, technological innovation, software, and hardware upgrading, is triggering a chain of breakthroughs, and accelerating the leap from digitalization and networking to intelligence in all economic and social fields. With the help of AI, it is possible to analyse student data to improve academic outcomes which assist to foster more efficient and effective learning environments. Now a days, AI is accelerating the rapid development in education sector in terms of teaching, learning & administration. ChatGPT is released in 2022 which is a significant milestone in the journey of AI. Today's AI has significant impact in every sector like business, healthcare, transportation, manufacturing etc. In education, AI is emerged and shows the potential benefits to students and teachers in teaching and learning process. Generative AI reshape educational paradigms and offer new possibilities for learning through advanced interactive experiences. Generative AI tools can be used to assist teachers, students & administrators for brainstorming ideas to enhance learning process. This paper demonstrates use of AI in education sector, AI Tools for teaching & learning, AI in administrative work, benefits of AI in education & challenges & risk.

II. AI IN EDUCATION

AI is changing the scenario in education by offering substantiated learning, adaptive literacy platforms, intelligent training systems, automated grading and feedback by using the following approaches.

A. Individualized learning : AI in assist individualized learning to the students as per their need by considering their own learning style. It also assist the

students to progress at their own pace with their speed and techniques.

B. Intelligent Training systems: AI instructor system can assist the students with adaptive study experience & corrective guidance depending on the feedback on student's performance. It helps to improve understanding of the subject where students are facing problems in difficult subjects and assist teachers to providing details of the students on the student's learning process.

C. Automated grading and feedback: AI assist the grading process by evaluating performance of student in different subjects, activities and other skills. It helps instructor to offer timely & constructive feedback to take corrective action among the students.

D.AI-driven Literacy: Different AI tools assist the teacher to develop content of the session as per the need of the students. Different interactive tools like virtual lab helps to engage students in academics . Also for peer learning, collaborative platforms are recommended which also assist for overall learning experience.

Assistive Technology Tools : Different tools can be used like speech recognition software is used to transcribe spoken words into text. It help disabled students who are facing hearing impairments & also assist by converting speech to text in their classroom study .

F. Curriculum Planning: Curriculum planning is very important to identify need of students and need of market. AI helps to plan curricula to make a balance between needs of industry along with different colleges. It assist to make syllabus applicable and aligned with learning objectives.

G. Interactive and Learning Games: To create adaptive learning experience & to engage the students , AI enhances different games . These games try to analyse responses of students and also understanding complex subjects.

III. AI TOOLS IN EDUCATION

AI tools are useful to the teachers to design lesson plans, content creation and its flow. These tools are able to generate images and customized content. These tools are useful for conducting research. Commonly used tools in teaching, learning & research are discussed in table no. 1 .

Table No 1 : AI Tools in Education

AI Tool	Description
PopBots	Introduce AI concepts through social interaction to school students
Google Teachable Machines	To explore machine learning & raising awareness of algorithmic bias to school students
Grammarly	Provide immediate feedback on a range of writing aspects, including grammar, punctuation, spelling, and syntax.
GenAI tools	Used as collaborators in the writing process
Carnegie	Provide personalized feedback of students by adapting to individual learning styles
Magic School, Eduaide AI	Provides simplifies lesson planning & assist to create assessments, & individualized education plans
Duolingo	Uses adaptive algorithms to identify language learning experiences.
Dysolve	Identify learning disabilities by analysing reading patterns and errors & provide tailored support and interventions to the affected students
Engage VR	Offer virtual environments to provide learning experience beyond traditional methods & provides opportunities for interactive and experiential learning.
Labster	Offer virtual labs to explore & experiment students with scientific concepts.
Wolfram Alpha	It demonstrate real-life applications of different theories & assist students to understand the interconnectedness of different fields of study.
Google Expeditions	Create virtual field trips to broaden students' horizons and helps to enhance students for their cultural understanding.
OpenAI	Help educators to use ChatGPT in classroom.

SlidesGo	With the help of Google Slides , it Provides access to free templates & acts as AI Presentation Maker.
Classcraft	Helps for classroom management to track student behaviour & take action
Edthena	Provide individualized learning paths to the students based on teaching needs.

Source : www.google.com

IV. USE OF AI IN ADMINISTRATIVE APPLICATIONS

Executive staff in education uses AI technologies to assist them in their day to day administrative tasks. AI

chatbots are used to organize schedules, and to develop sessions. It also assist to catalogue the details from large data sets. Table No. 2 describes commonly used AI tools for administration.

Table No 2 : AI Tools in Administration

AI Tool	Description
Avigilion	Helps to analyse and alert security personnel to suspicious activities.
Chatbots – Mainstay	Provide immediate support and assistance to the students outside classroom hours, & handling repetitive tasks.
Remo	Enhancing student engagement beyond the classroom.
Remind	Enable communication between parents and teachers,
SafeStop	Assist parents to track bus locations of student transportation.
Darktrace	Use machine learning algorithms to recognize network activity, avert data breaches and guard sensitive student information.
Cisco Digital Network Architecture	Helps to manage and enhance campus infrastructure, improve connectivity and overall campus experience.

Source : www.google.com

V. BENEFITS OF AI IN EDUCATION

In today's competitive world, AI is integrating into classrooms where students can personalize learning experiences & also assist for administrative tasks in education sector.

A.Assist Individualized Learning : AI algorithms are used to study and analyse student details

And provide learning paths to individual need of students . For this different platforms can be used like Dreambox, to study real time student responses and to adopt lessons dynamically.

B.Automated Administrative Tasks : AI assist for different administrative task like grading, scheduling and report generation with the help of tool like Gradescope . To optimize class timetables and resource allocation, AI scheduling software is used.

C. Engage students : To engage students in classroom different programs like Kahoot and Minecraft are used. It makes to create interactive quizzes and

simulations , so that students students become motivated and actively involved.

D. Actionable Insights : To provide educators with actionable insights, AI analyses vast amounts of educational data . Platforms like Knewton-Alta is used to track student performance across various metrics & helps to identify the learning gaps . It helps teacher to adjust and change their instructional strategies as per the need.

E. Better Security and Assessment Integrity : By using plagiarism detection Tools like Turnitin, AI enhances security and integrity of assessments. Also to monitor examination conditions to prevent cheating and helps to maintain discipline at the time of examination, AI supported proctoring systems are used .

VI. CHALLENGES AND RISK

Before using AI for teaching , learning & administrative work, it needs to consider different

challenges educators may face in teaching & learning process.

A. Privacy : Privacy is major concern in education , while using generative-AI tools by students and teachers, it is possible that their conversations and personal information might be stored and analysed , which is a risk to their privacy. AI tools collect and process large amount of data, so it is necessary to find how this data is protected. Hence there is a need to take consent from parents and students before using the data .

B. Bias : There is a probability that bias may inherit from AI systems when training data is used and may lead to unfair or discriminatory outcomes. There is a need to regularly spot –checking for bias to solve the problems .

C. Equity : It may happen that all students may not have equal access of technology by considering different resources. So education institutes must attempt to provide equitable access to AI resources. Also there is a need to provide training to the students and teachers regarding use of different AI tools.

D. Decreased Social connection: Since students & teachers spent more time using AI systems , there will be less interaction among students, their friends and classmates. It may happen that students become isolate from society and may suffer from crisis of loneliness.

E. Overreliance on technology : It happens that teachers and students may face the risk of becoming over reliance on AI-driven technology. Further it may affect the development of critical thinking , & intelligence among the students & teachers.

VII. CONCLUSION

In today's competitive world, the AI impacts in every sector like agriculture, business, healthcare , service sector & education. In education sector, the impact of AI is far –reaching & profound. AI technologies offers different opportunities for self learning and tries to improve educational outcomes. The use of AI in administration is in the form of to analyse vast amount of data, and to drive informed decisions and strategies. AI in administrative work allows higher authorities to concentrate more on strategic enterprise , human interaction and relationship-building. AI is breaking down education barrier among urban and rural students and provides learning styles as per their need, with the help of different tools. As changes are

updating in AI , there is a need that teachers must stay updated with the latest AI advancements in their teaching strategies with the help of on-going professional development programs. As AI evolves in education sector, learning become more personalized and effective, but there is a need to think about privacy, bias, and equity with the use of AI .

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