

Optimizing Higher Education Using Artificial Intelligence

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Abstract:

A revolutionary transformation and overhaul of our approach to how we instruct and interact with educational content is being heralded by the simultaneous development of artificial intelligence and education. Businesses dealing with educational technology are greatly engaging and spending exponentially over technologies delivering education by artificial intelligence. Such technologies generate highly interactive and deeply engaging educational experiences for the learners creating an everlasting impact. Some of the cutting-edge technologies that improve student engagement and encourage deeper connections with the educational content or the conversational assistants that interact verbally and virtually. Virtual reality (VR), Augmented reality (AR), holographic simulations, etc. are some more examples of AI generated applications which are now being used to create immersive learning experiences. This paper explores the role of AI in higher education, it's benefits for both learners & educators, it's application in H.E. classrooms, utilisation of AI-detection technology, challenges and strategies to implement AI seamlessly in educational settings. It is an effort made in order to discuss this emerging topic and to offer an insight into the constantly evolving relationship between AI an education.

Keywords: Higher education (HE), Artificial Intelligence (AI).

Introduction:

Artificial intelligence has been in existence for quite a while now but the dramatic emergence and evolution of various trends in technology in the last decade or two, have brought up a wave of transformation in the world of learning & education. This has posed a range of benefits as well as problems for higher education. New age technology, on one hand, has made things like exploring and accessing information, processing, analysing, faster, higher levels of automatization, more effective performance, and clearer perception possible. However, because students can utilize the same technology to do things more quickly and easily by leveraging artificial intelligence instead of their own knowledge and skills, instructors face various obstacles. As a result, pupils could end up not grasping specific ideas and procedures. This leads one to conclude that the more useful artificial intelligence systems, such chatbots and virtual assistants, have presented a unique set of issues for educators. When utilised appropriately, the artificial intelligence-based solutions that have been indicated can be quite beneficial for professional as well as students. But, if students opt for this alternative, artificial intelligence could replace a substantial portion of their labour, subsequently lowering the task-related skills and abilities in them.

Higher Education here represents the collegiate or university level education, post completion of secondary education.

Artificial Intelligence refers to the intelligence behind software or operating systems of machines/ devices, that is responsible for their functioning.

Basics of A.I.: For establishing general understanding of AI, let's keep the basics in consideration.

On the basis of capabilities there are two types of A.I.-

1. Artificial Narrow Intelligence (ANI) also referred to as weak AI and
2. Artificial General Intelligence (AGI) commonly known as strong AI.

On the basis of its functions there are two types:

1. Predictive AI analyses data & predicts future events or results,
2. Generative AI creates written content, like- essays, answers questions, simplifies complex texts, summarizes long texts, etc. One of the predominant example of generative AI is ChatGPT.

Teachers must adapt to the rapid pace at which students are embracing new technologies. Since educators must fit this into their already hectic schedules, which often becomes problematic. Educators will have to put a lot of effort into adapting to this new paradigm and providing students with adapted teaching models that will utilize new possibilities while preserving genuine education efforts.

Role of Artificial Intelligence in Education:

The transitioning role is becoming more and more notable. The way that education is provided is being revolutionised by artificial intelligence, which will make it readily available, productive, and customised. Fundamentally, artificial intelligence in education is about recognising and meeting the needs of each unique learner. It does this by analysing data, which gives teachers insights into how well their students are performing and helps them adjust their lesson. Personalised learning is a key component of artificial intelligence in education. AI-driven solutions are able to adjust assessment, pace, and content to fit each student's individual learning style and level of proficiency. By ensuring that students receive the appropriate amount of assistance and difficulties, this improves their engagement and overall learning outcomes. It makes it easier to automate administrative duties like scheduling and grading, giving teachers an additional opportunity to concentrate on instruction. In addition, it facilitates the creation of adaptive teaching systems that function similarly to human tutors by providing students with prompt feedback and direction. The applications of artificial intelligence go beyond the setting of the classroom. With capabilities like speech-to-text and text-to-speech innovations, it improves accessibility for students with impairments and makes it possible to create adapted instructional resources. Even though artificial intelligence (AI) has tremendous possibilities for improvement in education, issues including data security, moral dilemmas, and the technological gap need to be resolved to guarantee fair access and responsible use. Artificial intelligence is set to change education as a field, offering students of all skill levels and backgrounds a more tailored and efficient learning experience.

Advantages of Artificial Intelligence in Higher Education:

Profound learning can be made possible in higher education classes by the incorporation of AI. AI makes individual instruction possible by adapting to the skill level and rate of learning of each student, which subsequently promotes comprehension at a deeper level as opposed to memorised learning. In AI incorporated learning setting, the role of teacher changes from imparting knowledge to serving as mentors who help students develop their capacity for thought and analytical skills. To provide fair access, stop abuse, and safeguard data privacy, its consumption should be properly controlled.

Advantages for the Learners:

- AI can adjust to each student's unique learning preferences and speed, offering tailored materials and feedback.
- By generating interactive learning environments like virtual reality and simulations, AI-driven technologies can raise student comprehension and engagement levels.
- AI applications are able to give students immediate insight on their examinations and assignments, enabling them to identify their areas of strength and growth.
- AI solutions, such as speech recognition, translation services, and visual or audio aids, can help students with unique needs.
- Taking into account the learner's interests, objectives, and academic performance, AI can help with career counselling, degree planning, and course selection.
- Integrity and honesty in academics are promoted by AI systems' ability to identify instances of plagiarism.
- AI-driven study applications can assist students with time management, study reminders, and comprehension and memorising support.
- Artificial intelligence chatbots are able to respond to standard questions in real time, giving students assistance whenever they need it.
- Students can experience technology that they will come across in many of their future careers by utilising AI tools.

Advantages for the Educators:

- Tools driven by artificial intelligence give teachers insightful information on how well their students are performing.
- Teachers can monitor students' progress both individually and as a class, using learning analytics and data-driven dashboards to pinpoint areas where students can benefit from extra help.
- AI is able to assess the learning patterns of students and give teachers ideas into how to improve their teaching strategies. By adjusting their teaching strategies and interventions to better meet the needs of their students, educators can improve learning outcomes through the use of data-driven approaches.
- AI-powered intelligent tutoring programmes serve as virtual teaching assistants, offering pupils on-demand assistance, utilising these platforms, educators may provide individualised support and materials, expanding their reach outside of the typical classroom setting.
- Individualised method keeps students interested and involved while improving the quality of learning.
- Planning and developing curricula can also benefit from artificial intelligence.
- Artificial Intelligence has the ability to make recommendations for enhancements to course content, assessment techniques, and general teaching tactics through the analysis of statistics on learner achievement and educational trends, which guarantees that teachers have the best resources and methods at their disposal to address the requirements of their pupils.
- AI offers teachers the time-efficient tools, insights based on data, and individualised assistance they need to succeed in their jobs as learning facilitators.
- Artificial intelligence not only improves student learning, but it also helps teachers become more effective teachers and grow professionally, which raises the standard of education as a whole.

Application of Artificial Intelligence in the Higher Education Classroom

Applications of artificial intelligence that improve teaching, learning, and administrative procedures are transforming education. Artificial intelligence powering personalised learning adapt instructional materials to each student's unique needs, encouraging participation and progress in the classroom. Smart Tutoring Systems offer support and feedback whenever needed, and adaptive tests guarantee that students are given the right kind of challenge. Artificial intelligence helps with language acquisition by helping with pronunciation and providing translation services. It also automates grading and provides fast feedback. Artificial intelligence is used in learning analytics to extract knowledge from student data, which then informs curriculum updates and resource distribution. Virtual reality and augmented reality technologies immerse students in dynamic learning environments, while artificial intelligence-generated content produces interactive teaching materials. In addition to streamlining administrative duties and addressing mental health issues, emotional support chatbots also increase institutional efficiency and resource allocation. In addition to promoting ease of access, artificial intelligence benefits students with disabilities. Notwithstanding its revolutionary potential, legal concerns, confidentiality of data, as well as accountable usage of AI need to take precedence. Artificial Intelligence is expected to play a bigger role in education in the foreseeable future, changing the way knowledge is shared and making high-quality education more accessible to all people worldwide.

Utilising AI Detection Technologies:

Different ways are being used by universities & bodies related to higher education, to mentor their academic members in regards to the different AI based academic tools & detection softwares. While some have established more comprehensive policies and occasionally leave it up to the faculty to decide how much they want to include AI into their instruction, others are providing hands-on workshops on the topic. The very popular plagiarism detection programme 'Turnitin' has stated that starting in 2023, it would keep adding more AI-specific functionality. Other softwares or applications for AI based plagiarism detection like GPTZero, a university-developed AI detection programme that promises to be able to recognise AI-generated text, & many others like- CrossPlag, Gltr.io, and OpenAI's AI text classifier, Sapling, Unicheck's Emma, Copyleaks, Originality.ai, etc.

Creating an AI-Free Space for Development of Mental Creativity:

It becomes really essential to provide a gap or break from all the technology that learners are already exposed to in their daily lives for all the academic & other works. Increasing dependency on gadgets, softwares or technology we may say, is reducing our general humane abilities, including to think, analyse, problem solving, etc.

Using methods that are technology proof, in order to reduce the mental dependency of students on artificial intelligence, like- Group discussions, laboratory-based experiments, DIY tasks, reflective essays or papers, extempore presentations, Field trips, oral exams, peer teaching call mom group activities, simulated settings and role plays, report writings based on experiences of field trips, etc.

Challenges:

- Anti-plagiarism softwares are still not functioning efficiently at catching AI generated content.
- ChatGPT and generative AI models are erratic, and AI businesses don't always fully comprehend their operation.

- Regulations regarding the use of AI tools in education have not yet been implemented by several educational institutions. This law enforcement gap paves the path to misuse and confusion.
- In accordance with organisational policy and applicable legal requirements, institutions should have controls or rules in place to identify and regularly produce biased results.
- As AI becomes more prevalent in classrooms, questions concerning its ethics and dependability have been raised. As AI-based content generating softwares usually generate content with missing context, inaccurate citations or misleading explanations which further leads to confusion.
- Information can be created by generative AI systems. Institutions should assess information's appropriateness, accuracy, and utility before using it or disseminating it to the public.
- Educators must adapt and become familiar with standard AI tools. Instructors must be able to recognise how these resources can be both relevant and limiting to their courses, and faculty must understand that students will be utilising AI in their work.
- All entered data or searches may become public knowledge due to a lack of data administration and security guarantees pertaining to confidential information.
- AI in higher education has ethical ramifications, which emphasise the need to think carefully about issues related to privacy, justice, openness, and potential prejudice. While ChatGPT and other AI tools can certainly help with learning, it's important to make sure they're used ethically and don't violate any moral principles.
- Despite the fact that AI has a lot of potential to improve learning, these issues must be addressed. These problems can be lessened by establishing precise rules for the use of AI, enhancing the precision of AI tools, and establishing a strong ethical framework.
- Generative AI is associated with inherent risks, including accuracy, bias, fraud, and sustainability. For example, ChatGPT and similar tools lack compliance with data protection and copyright laws (e.g., GDPR).
- Organisations need to make sure that mitigating measures are in place and ready for the harmful use of generative AI systems for fraud and cyberattacks.
- To lessen the impact, institutions should choose suppliers who use less electricity and make use of high-quality renewable energy.

Strategies:

Teachers should utilise the time to interact & engage with students more deeply. AI tools can help faculty members with a variety of administrative and instructional tasks, including note-taking, assignment analysis, record-keeping, and daily reminders and notes. Faculty members can free up more time to personalise and customise content for each class by adopting AI software and systems to automate these repetitive procedures. This allows faculty members to better use their expertise of the needs and strengths of their students. Instructors might also want to look into how AI-powered chatbots can assist them in creating more specialised materials for their pupils.

By identifying trends and suggesting an optional approach that takes into account the requirements and strengths of each student, AI-enabled systems have the potential to improve formative evaluations. Artificial intelligence (AI) systems can give students fast feedback on difficult abilities, like learning American Sign Language, even when there isn't a teaching member nearby to offer it. In addition, AI might be able to improve accessibility to feedback, especially for students with neurodiverse backgrounds, by speaking with them face-to-face about assignments and posing thought-provoking questions that

require them to type on a keyboard or read a screen. AI-powered formative assessment integration can improve higher education's efficiency in meeting student learning objectives. AI enhanced formative assessment might help in reducing though load of grading on teachers.

Conclusion:

Since higher education creates new experts who are essential for all forms of subsequent growth, it plays a significant role in propelling progress. For many years, there have been opportunities and problems in higher education due to advancements in technology. As time and again opportunities are often disguised as challenges, one such development in the recent times presents both an opportunity and a challenge. Students as well as professionals can both profit from AI and the range of tools that are based upon it. It can increase productivity, make learning more interesting, and save time. On the other hand, it gives pupils the option to omit crucial lessons and rely too heavily on artificial intelligence output. Learning about the potential applications of artificial intelligence in education, as well as identifying the best strategies and models to take advantage of these benefits while also encouraging the growth of individual knowledge and abilities, will be a major task for educators.

To sum up, incorporating artificial intelligence into higher education presents a positive and revolutionary way forward. At the nexus of cutting-edge technical innovation and centuries-old teaching traditions lies the future of higher education. By utilising AI to improve education, we open up a world of possibilities that are advantageous to both teachers and students. Artificial intelligence makes it possible to customise learning experiences by making educational materials more relevant to each learner. Artificial intelligence also broadens the scope of education by improving accessibility for a variety of audiences, bridging demographic divides, and encouraging global participation.

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