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ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: IMPLICATIONS, CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Over the past few months, the rise of artificial intelligence (AI), and more especially AI generative tools, has caused alarm in the education sector. The main worry amongst institutions is that the implementation of AI will threaten important academic paradigms, such as those related to assessment, course design, activities, and more. Artificial Intelligence (AI) has already had a significant impact on a wide range of industries, and higher education is no exception. AI and automation are revolutionizing the way students learn and transforming the education system as we know it. In this article, we'll explore the ways in which AI is impacting higher education, both in terms of challenges and opportunities. But concentrating on the difficulties will only serve to obscure the numerous advantages AI has to offer. Rather than disregarding AI, educators ought to dedicate some time to investigating and experimenting with this novel technology, thereby assisting students in doing so. Above all, strong institutional leadership is necessary to ensure a seamless adoption process for AI. The associated duties are included in these obligations need to be studied.

1. INTRODUCTION

Many researchers have explored the challenges and opportunities of usinf Artificial Intelligence in higher education for the past one decade [1-6]. In this article, opportunities of AI in higher education, existing challenges and their acceptance level have been discussed briefly with some quotations given by various experts for AI in higher education.

1.1 OPPORTUNITIES OF AI IN HIGHER EDUCATION

"AI technologies are increasingly a viable way for institutions to save money and improve efficiency and workflows. The potential is growing for AI to address more complex and higher-stakes tasks."

While considering the development of AI, the above statement has been specially highlighted by the Educause Horizon Report 2023 - Teaching and Learning edition. According to an Educause QuickPoll, opinions regarding AI in higher education have increasingly improved along with its increasing acceptance. There are many applications for artificial intelligence that educators and faculty have found by taking the initiative to investigate and play with the technology. Dreaming, Drudgery, Design, and Development are the "4 common areas of work" that respondents to the QuickPoll noted as having significant benefits from generative AI.

These use cases apply to AI in general as well. AI's potential also extends to a wide range of other educational fields, including productivity, data analytics, and more. The following section will examine

1.1.1 AI FOR CONTENT DESIGN AND CREATIVITY

With its ability to create assignments, lesson plans, presentations, study materials, examples, evaluation rubrics, and more, AI may be a great help when developing curricula. For instance, you can request that ChatGPT design a lesson plan based on the learning objectives you specify or provide a ton of examples huge help students understand the ideas they are studying. Moreover, a number of AI tools can assist in producing or modifying multimedia study content, including papers, videos, and photographs. An article on the practical applications of AI tools for content creation was written by Wharton School Associate Professor Ethan Mollick [7]. A number of tools for the idea and content generation process are suggested in the Table 1 below.

FIGURE 1.1 SOME AI TOOLS FOR CONTENT CREATION [8].

USE CASE	TOOLS	PRICING
• Content creation (blogs, summaries, emails, CVS, etc.) • Ideas generation (brainstorming, resources suggestions, etc.)	ChatGPT 3.5	Free
	Chat GPT 4.0	Paid
	Bing AI	Free
	Notion AI	Free trial with limited use
	wordtune	10-day free trial
Visual creation: Illustrate presentations or reports; Stock photographs; mockups of designs, apps, or websites; design logos	Stable Diffusion	Free
	Bing Image Creator	Free
	Playground	Free
	Midjourney	Free
Video creation	D-iD	Free
	ElevenLabs	FeedbackFruits
Coding	ChatGPT 3.5	Free
	ChatGPT 4.0	Paid
Transcription	Otter AI	Free trial

"AI is perfect for idea generation and can be extremely helpful in **overcoming thought-blockers**." AI can help educators come up with a ton of fresh concepts and ideas for lesson plans, test questions, evaluation standards, and other things. Another area where AI has shown to be quite beneficial is **assessment**. AI may assist with a variety of assessment tasks, including case **study situations, quiz questions, and course rubric creation.** When designing a course, teachers can save a ton of time by having AI come up with early concepts or the first draft of a syllabus or lesson plan, all the while investigating new pedagogical approaches. In general, using AI tools to generate ideas and create content can be a good approach to increase the **effectiveness, efficiency, and creativity** of educators.

1.1.2 CHATGPT AND THE RISE OF AI WRITERS: HOW SHOULD HIGHER EDUCATION RESPOND?

Platforms using deep machine learning are now able to generate text that looks human in real time. The most recent craze centers on the astounding powers of GPT-3.5 and ChatGPT. Within five days of its launch on December 2, the AI chatbot with a new, user-friendly interface had drawn in over a million users. The number of content writers with AI capabilities is increasing; a few examples are Rytr, CopyAI, and Jasper. What distinguishes ChatGPT, then? It is still learning, very productive, and prolific. It's also free. Students often lack the funds to use the majority of these platforms. It's universally usable thanks to the new interface. A recent development that makes chat more engaging, approachable, and interactive is the integration of AI-enabled content creation.

Excellent text can be produced in any structured language, including all code languages, essays, blog posts, marketing materials, and poetry, using ChatGPT and GPT-3.5. A new tool called ChatGPT was created by the research lab OpenAI. It leverages artificial intelligence (AI) to facilitate natural language communication. A deep learning model that has been trained on sizable datasets of human dialogues is how it operates. After then, this model is applied to produce responses to user questions that sound natural. ChatGPT has the power to completely change how we interact with computers and could have a significant effect on university education. ChatGPT, for instance, can be used to make virtual tutors, engage with students during lectures, and assist in providing answers to queries regarding the course material.

It might also be used to develop **virtual research assistants**, which would enable students to ask questions and get prompt, precise responses. Furthermore, ChatGPT may facilitate more intelligent dialogues among educators, learners, and researchers, enhancing their ability to work together more successfully. Naturally, some people think this is not a huge deal. They draw attention to the fact that text produced by AI is not flawless, is dishonest, and does not give a damn about accuracy. For instance, it replicates biases found in the literature and generates phony citations. What we must address are the wider ramifications for higher education. Universities can no longer ignore ChatGPT or treat AI writers with a band-aid solution. Rapid, significant change is required. These are tools that we must accept and incorporate into our policies and pedagogies. Strict dismissal procedures, lockdown browsers, and banning the use of these platforms are not viable solutions.

1.2 PROMOTE INCLUSIVITY AND ACCESSIBILITY

The promise of AI-enabled applications is that they might facilitate a transition from“one size fits all” technology to scalable implementations of personalized learning experiences. – *Educause Horizon Report 2023 | Teaching and Learning edition* Institutions have come to several crucial realizations as a result of the sudden shift to online learning during the last two years. The most important of these is the requirement to create an accessible and inclusive learning environment that takes into account the varied needs of students and removes obstacles to learning.

- In order to achieve high-quality education, **diversity, equity, and inclusion (DEI)** have been regarded as one of the main goals at many institutions.
- Faculty members must thus make sure that students with various learning styles, needs, and backgrounds have fair access to opportunities for meaningful learning as well as prompt assistance and support.
- Addressing these action items is clearly difficult, though. With a large student body and learners coming from different parts of the country, teachers have a lot of work ahead of them. They have to spend a lot of time marking tests, providing feedback, and putting students in groups for group projects. This leaves them with little time to customize the learning experiences.

The ability of AI technologies to handle these tiresome duties, freeing up faculty members to interact with students and concentrate on more difficult pedagogical responsibilities like **developing real-world skills, data analysis, and student evaluation**. Here are some methods that educators can use to use AI to design accessible, inclusive learning environments.

- **Give students immediate, automated feedback** on their writing's mechanics, including citation style, grammar, spelling, and content organization. This lets teachers focus on teaching higher-order writing skills like reasoning and argumentation while also motivating students to actively review their work and make improvements. One tool that uses AI to provide automatic writing feedback is called FeedbackFruits Automated Feedback [9].
- **Answer lower-order questions from students**: Respond to students' more basic inquiries by giving clarifications, definitions, or examples of particular study topics. AI gives users the opportunity to engage with the tools by posing follow-up questions until a satisfactory response is obtained, in contrast to search engines. Students not only learn questioning and self-reliance, but they also have to assess the accuracy of the responses.

1.3 INCREASE PRODUCTIVITY AND EFFICIENCY WITH AI

AI can be used in higher education to improve a wide range of strategic and operational tasks in addition to teaching and learning.

- **Round-the-clock assistance for students:** AI chatbots that can respond to basic student inquiries can be a huge help to IT help desks, which typically receive a ton of questions each day. The IT team will be able to look into more serious cases if these tools, which are becoming more accurate and useful, are adopted by all faculties to assist students in accessing basic information and troubleshooting.
- **Data-informed practice**: Large volumes of institutional data can be gathered and processed by AI technology, which allows it to produce comprehensive insights from these disparate data points. At Nova Southeastern University in the United States, retention rates have significantly increased as a result of using AI to recognize and contact prospective dropouts. In a similar vein, the University of Sydney adopted a thorough AI strategy that enhanced services and learning opportunities for staff members as well as current and potential students. These are just a few of the numerous instances where applying AI to data insights has proven to be successful.

2. EXISTING CHALLENGES

Notwithstanding its many advantages, AI raises a few pedagogical and ethical issues for institutions to take into account.

- **Hallucinations and biased information:** Since AI is trained on data, the underlying data may contain implicit or explicit biases that lead to discrimination against women and minorities, among other groups of people. This has the potential to exacerbate already-existing social injustices and jeopardize the values of educational equity and equal opportunity. Artificial intelligence (AI) can easily produce convincing-looking hallucinations or plausible facts—content that is entirely false. Put another way, faculty and students must develop the capacity to critically assess AI-generated content because it may not always be trustworthy.
- **Data privacy:** Concern over privacy and data protection is also growing. Sensitive personal data, including academic performance and behavioral patterns of students, may need to be collected and analyzed in order to use artificial intelligence (AI) in higher education. It is imperative for institutions utilizing AI

systems to guarantee that the information gathered is put to good use, not abused, and isn't disclosed to unapproved parties.

- **Assessment change:** "*Nobody learns, nobody gains. If ever there was a time to rethink assessment, it's now*." – Mike Sharples, in New AI tools that can write student essays require educators to rethink teaching and assessment [10]. The emergence of artificial intelligence (AI) has forced educational institutions to abandon conventional assessment methods in favor of comprehensive evaluation strategies that encourage genuineness and lifetime learning. While this shift does improve the quality of assessments, it also means that faculty members will have to work harder to communicate with staff and students, implement new assessment techniques, record assessment results, and other related tasks.
- **Job displacement:** AI integration in higher education raises ethical questions about the effects on the academic workforce since it may cause job displacement for institutions. To guarantee AI's responsible and equitable use in higher education, it is imperative to address these ethical issues.
- **Cost:** Implementing AI technologies can be expensive. Many universities and colleges may struggle with budget constraints, making it difficult to invest in AI infrastructure and tools.
- **Resistance to Change:** Faculty, staff, and students may be resistant to adopting AI technologies, viewing them as a threat to traditional teaching and learning methods. Resistance to change can hinder the successful integration of AI in education.
- **Lack of Expertise:** Developing, implementing, and maintaining AI systems requires expertise that may not be readily available in higher education institutions. There can be a shortage of qualified AI professionals.
- **Ethical Concerns:** AI raises ethical questions, especially in areas like student surveillance, plagiarism detection, and personalized learning. Ensuring that AI is used ethically and transparently is crucial.
- **Accessibility:** Not all students have equal access to technology. Implementing AI in education can exacerbate disparities if not all students can access and benefit from these tools.
- **Quality Control:** AI can automate various tasks, but ensuring the quality and accuracy of the education provided by AI systems is a challenge. It's essential to strike a balance between automation and maintaining educational quality.
- **Content Customization:** Personalized learning with AI is promising, but tailoring content to individual students can be complex, as it requires a deep understanding of each student's unique learning needs and preferences.

- **Regulatory Compliance**: Universities must navigate a complex web of regulations and accreditation requirements. Implementing AI in a way that complies with these regulations can be challenging.
- **Faculty Development**: Training faculty to effectively use AI tools and incorporate them into their teaching methods can be time-consuming and may require substantial professional development efforts.
- **Integration with Existing Systems:** Integrating AI into existing education technology infrastructure can be complicated. Ensuring that new AI systems work seamlessly with legacy systems and processes is a significant challenge.

Despite these challenges, AI has the potential to revolutionize higher education by enhancing learning experiences, improving administrative efficiency, and advancing research. Institutions that address these challenges effectively can harness the benefits of AI while minimizing its drawbacks.

3. ACCEPTING THE CHALLENGES AND OPPORTUNITIES PRESENTED BY AI IN HIGHER EDUCATION

How can organizations maximize the benefits of AI while avoiding its drawbacks? The best course of action is to modify the curriculum to incorporate AI technology and ensure that faculty and students have a solid understanding of AI.

3.1 FOCUS ON DIGITAL LITERACY TRAINING FOR BOTH STUDENTS AND FACULTY

"*Students are going to think and use this chatbot (ChatGPT) as if it is a know-all. That's because it's a technology that is creating these things that sound really legitimate, they are going to assume that it is and take it at face value*." – said Austin Ambrose[11].

Every second, a new technological advancement or digital tool is released, providing new avenues for information access and time-consuming task completion. Digital literacy, or the capacity to properly analyze, appraise, and use technology and incoming information, has become recognized as a vital skill set for students. It is therefore necessary to modify the curriculum in order to support students in acquiring this crucial ability.

"*Information literacy is the single most important skill to develop if we are to counter the misinformation that convincing AI-generated text can produce*." – Nancy Gleeson [12].

In order to assist instructors in gaining a comprehensive understanding and set of abilities to incorporate cutting-edge technologies, curriculum adaptation also calls for appropriate professional training. As hybrid and online learning continue and become more common, it is critical that faculty members gain proficiency with a variety of technologies, including artificial intelligence. More funds are being allocated by many universities to faculty training initiatives in an effort to enhance their ability to teach and deliver courses.

3.2 ACCOMMODATE AI TECHNOLOGY IN THE CURRICULUM (TEACHING AND LEARNING)

Many educators see AI technology as a great opportunity to improve and scale effective teaching, rather than as a threat. There are many ways educators can incorporate AI technology into the curriculum to enhance the teaching and learning experience. Nancy Gleeson, an associate professor at New York University Abu Dhabi, discussed the necessity of a curriculum that incorporates AI, as stated:

"*We need to embrace these tools and integrate them into pedagogies and policies. Lockdown browsers, strict dismissal policies, and forbidding the use of these platforms is not a sustainable way forward*."

Marnie [13] responded about the role of proctoring in ensuring the integrity of online courses:

"*There are a lot of great tools and technology out there as a cheating deterrent. There is no foolproof system, unfortunately. If students are determined to find a way to cheat, they will find a way to cheat, unfortunately. Incorporating a variety of strategies into your assessments to deter cheating is probably the best method and setup*."

So how can institutions respond to the rise of AI technology? Marnie again gave an excellent remark:

"*Rely on not just one tool but rely on several things: creating tasks that are open-ended questions or essays is probably a great strategy; randomizing questions and randomizing answers so that no two students are getting presented with the same set of questions or in the same order that's another way (...) Just depends on the goals and achievements of a particular assessment. Consider maybe changing the activity entirely where students work together, collaborate, and learn from each other. Discuss a particular question, and arrive at the answer together.*"

4. CONCLUSION

With the projected 40% increase in AI use in higher education between 2021 and 2027, it is obvious that institutions must have a comprehensive plan in place for implementing and integrating this technology. Associate Professor Nancy Gleeson of New York University Abu Dhabi discussed the necessity of incorporating AI into education:

"*We need to embrace these tools and integrate them into pedagogies and policies. Lockdown browsers, strict dismissal policies, and forbidding the use of these platforms is not a sustainable way forward*."

The uses of AI in higher education present a number of difficulties as well as ethical questions, but the advantages of this technology are immense and should not be disregarded. AI has the potential to significantly improve accessibility and inclusivity, increase productivity and efficiency, and improve learning experiences. As a result, organizations must carefully consider how to integrate AI while guaranteeing that it is used fairly and responsibly. Faculty members can improve learning environments that are inclusive, adaptable, and responsive to each and every student by utilizing AI and new technologies. Artificial Intelligence (AI) technology has the potential to accelerate the transformation of education, but it will not end education altogether. It's time for educational institutions to make the most of artificial intelligence and emerging technologies to improve inclusive, adaptable, and student-centered learning environments. Organizations will need to plan how to use AI to maintain fairness and equity while boosting productivity, promoting learning, fostering creativity, driving innovation, and facilitating growth.

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