Enhancing Higher Education Through Artificial Intelligence

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Abstract—**AI in education is the most emerging field from educational technology. Educators are still uncertain about how to leverage it more broadly for pedagogical purposes and whether it actually has the potential to make an impact on teaching and learning in higher education. This study seeks to provide an overview of research on AI applications in higher education through a systematic review.**

The descriptors found that most of the disciplines represented in AI publications are STEM and Computer Science, and that empirical studies tended to use quantitative approaches. Results synthesis: four areas of AI applications in academic support guidance services and institutional and administrative services: 1. Prediction and profiling; 2. Evaluation and assessment; 3. Adaptive systems and personalization; and 4. Intelligent tutoring systems. The results shed light on the challenges and risks of AI that are not widely critically addressed, the lack of theoretical pedagogical arguments that are closely related to AI, and the need for further studies of ethical and pedagogical approaches for implementing Artificial Intelligence in higher education.

Index Terms—**Artificial Intelligence(AI), higher education, Technology**

I. INTRODUCTION

In recent years, the power of artificial intelligence (AI) has been growing at a rapid speed, attracting public attention. Besides, AI is being used in multiple sectors, including improving the way we learn. AI technology efficiently tracks the learning pace and helps to set realistic goals if used by a great educator. However, about 258 million children and adolescents are not in school, including 123 million young people with formal learning experience who lack minimum reading and mathematics skills. Especially, this calls for more AI in learning. There is an urgent need for the application of new technologies to achieve, among others, access and quality in education. Therefore, this paper aims to illustrate that AI, by revolutionizing the learning model, can also change the teaching model, going beyond the frontiers of tutoring in teaching.

The fundamental question on the efficiency and equity of traditional schooling has led to the search for a new teaching and learning model for forty years. Although many discussions have been held on each of these concepts and on the need for a plural vision, the debate on the necessary elements for learning in general and the optimal teaching-learning model is particularly recurrent. We can identify that the reduction of the teaching-learning model is perceptible. According to the analysis carried out the current learning model simplifies the learning process in just six main points. These are (a) determining the effectiveness of a subject's contribution to academic success

(b) understanding and monitoring all students simultaneously

(c) working with tutorship, activation, formative evaluation, feedback or guidance, and motivational stimulation

(d) getting students to take into account the teacher's demands and offer quality academic performance across subjects over time

(e) offering a model to streamline the university's own management

(f) elucidating the abilities that should not only be called into question for the teaching-learning process but also for achieving the newly created degree profile.

The Role of Artificial Intelligence in Higher Education
This section has explored that AI in higher education institutions can be viewed from several dimensions. These mainly include system-level support for enhancing the internal workings of educational institutions, such as optimizing research output, administrative efficiency, and improving the relationships among students, teachers, management, and society. At the broader level, it may be viewed as a data-based decision-making support system. It can

also be considered part of the internal educational system support role in enhancing the learning environment. It would also require a few changes in institutional policies and governance to meet the challenges of smart education technologies. Lastly, to remain competitive, higher education needs to adopt AI in the systems and operations for providing better quality of service.

Learning analytics has been defined as the measurement, collection, analysis, and reporting of data about learners and their contexts for the purposes of understanding and optimizing learning and the environments in which it occurs. It combines the most advanced technologies of computer science, artificial intelligence, and human-computer interaction with educational research. Learning analytics is about understanding and optimizing learning and the environments in which it takes place. It can be used to inform thousands of decisions about learning and teaching. It helps to identify students at risk in time for intervention. Predictive models are established by collecting and analyzing the data and selecting significant variables, and these models are used to identify students who are likely to achieve poor results. They are also used to optimize programs and courses, technologies, and support costs. For example, research has found that students with higher grades are likely to score higher in online discussions, while students with lower grades tend to post fewer and shorter messages. However, students with higher grades are likely to use readers and aggregators.

Applications of AI in Teaching and Learning

1. Personalized Learning.

One of the largest impacts artificial intelligence (AI) technologies are having on education is enabling personalized learning. There are multiple teaching methodologies that AI can use to achieve personalized learning. Adaptive learning modifies the sequence of the lessons and the type of assessments that each student experiences, based on their performance throughout the course. These systems respond to a student's success or lack thereof in real time. There are currently many AI adaptive learning platforms integrated in various learning management systems.

One of the major benefits of personalized learning is that it creates courses that can increase student motivation through students having some control over

aspects of the content and learning process. Although learning at one's own pace is very beneficial to students who excel and to those who require time to fully absorb information, there could be challenges in implementing education personalized to individual students' needs on a mass scale. The educators' schedules and the instructions are designed to fit the many, not the one. Personalizing a learning strategy could require professional development for current teachers, which some may resist, or hiring more instructors, which costs additional funds. This trend could upend traditional models of education by making it increasingly difficult to determine the exact content every educator should know. Educators may need solutions to ensure they are teaching the tools needed for learners in a future AI-driven world. For institutional leaders, AI can help measure student performance and anticipate academic struggles as it monitors effort and habits, possibly rearranging a learning plan based on the student's engagement and assessment results.

2. Automated Assessment and Feedback

Automated assessment and feedback are probably the most developed fields in implementing AI technology in higher education. Automatic grading in massive online courses and quizzes, as well as plagiarism detection tools, are some solutions splitting roles in grading between faculty and machine graders. The evident responsibility lies with humans to build assessment criteria and evaluate them. However, the machine could share in the process. While auto-graders are allocating a significant number of grading procedures, this could free teachers to have additional time to support students, enhance equality in grading, and make instructors aware of mistakes in the assessment criteria. Currently, a variety of automated feedback systems incorporated in education can illustrate the advantages of AI-based assisted assessment by automating the constructive performance process. Automated writing evaluation systems not only provide automated feedback but also recommend instructions to improve students' writing. Further, tutorial recommendations to improve critical reflection writing are provided. Immediate feedback, regardless of its source, has significant benefits. Students explained that receiving prompt feedback on their assignments improved their learning more effectively than other teaching methods and that tutors

should focus on feedback that will help students understand what constitutes good performance. Automated feedback provides instant validation for the learners, and it can motivate them. Feedback halved the quantity of student mistakes in a composition writing study, which shows that students apply corrections to their work after its provision. Additionally, it has been argued that automated feedback in the form of instant corrections increases a student's ability to retain information. Learners benefit from feedback that serves as a form of tutor response. This requires it to be both informative and instructive.

II. CHALLENGES.AND.ETHICAL.CONSIDERATIONS

Despite its great potential, there are a number of technology-agnostic and AI-specific challenges in bringing AI into higher education. Key technology-agnostic challenges are ensuring trust, equity of access and success, privacy and security, digital and data literacy, and data ownership and interoperability. Ethical issues around AI range from more general responsibility and accountability for the use of AI in society to more specific issues around transparency, reliability, fairness, data protection, and non-discrimination. It focuses in particular on upcoming opportunities and threats, as well as on the hopes, fears, beliefs, and motivations of a wide range of individuals and groups linked to, but not grounded in, EdTech.

Data privacy issues are a major concern in higher education. It is crucial to secure student data when deploying AI models, applications, or systems to process it. Efforts aimed at understanding the risks of AI with relation to data privacy are underway in the form of regulations passed by government agencies. These regulations are designed to protect the fundamental rights and freedoms of individuals and, in particular, their right to the protection of personal data. Moreover, biased and unfair predictions in assessments using AI models can lead to the generation of harmful decisions. The problem of 'manipulatable' and 'unfair' models that underlie false predictions can trick them into allowing suggested actions. The amount of bias or unfairness caused by AI applications depends on the quality of the data they are fed, and AI models can be sensitive to data imperfections and limitations. This is why people from the AI domain tend to emphasize that 'data is a key resource in AI' and 'AI is only as good as the data it is trained on.' Although an AI system's lack of transparency has created frustration and concerns among many, it could also be an elephant in the room. This is a source of frustration and could erode trust in AI development. While AI applications are opaque, explanations about decisions AI makes are usually not provided, obstructing full understanding of its decisions.

III. FUTURE DIRECTIONS AND OPPORTUNITIES

The current AI-enabled products and services reviewed in this paper offer a view of what is possible for the future. Innovation in learning analytics, chatbots, and adaptive learning appear promising in both developing personalized curriculums for students and enhancing the student learning experience. Nevertheless, there is wider potential for enhancing educational experiences by blending AI with other emerging technologies, such as VR and AR. For instance, researchers and educators have developed immersive learning experiences using VR and AR. Applications for these types of experiences range from explaining abstract or complex scientific concepts in ways that are more comprehensible and tangible to teaching or practicing particular procedures, such as in medical or military training.

In the context of this emerging field, the relatively nascent AI-based projects and strategies being utilized by universities, and the significant attention given to near-market L&T support solutions, offer a wealth of future opportunity. AI can be utilized to help educators and institutions study what engages students within these learning games, to learn where and what interventions are necessary to progress learning and how different game components influence performance. For some students, the interventions can reduce performance and encroach on genuine learning. Here, developmental research and professional learning can provide insights and support to educators to use AI information to best inform support sessions or other mechanisms to fill the educational gap caused by extended AI involvement. Much of this work is speculative and heavily dependent on ongoing research occurring at the intricate intersection of AI and education. It is crucial that the field maintains a

foundational orientation on guaranteeing that AI provides equitable access to the socio-economic and lifelong benefits of higher education for these 17%. AI in education might come in unexpected forms; its broad and equitable application can redefine higher education participation and accessibility. But imagination should be grounded in ethics, research, and collaboration with the education sector.

REFERENCES

[1] K. Arar, A. Saiti, and G. Prokopiadou "Higher education and equitable life-long learning for diversified students in the digital era"2021.

[2] O.A.G. Opesemowo and V. Adekomaya "Harnessing Artificial Intelligence for Advancing Sustainable Development Goals in South Africa's Higher Education System: A Qualitative Study"2024.

[3] O. A. Ajani, B. Gamede, and T. C. Matiyenga "Leveraging artificial intelligence to enhance teaching and learning in higher education: Promoting quality education and critical engagement"2024.

[4] O. Orogun, L. Ogungbe, A. Ajani and N. Adegboye "Advancing Educational Equity through Sustainable AI Deployment: Strategies and Innovations for the United Kingdom"2024.

[5] M. G. Nuary, L. Judijanto, and E. S. Nurliyah, "Impact of AI in Education and Social Development through Individual Empowerment" 2022.

[6] T. N. Fitria, "Artificial intelligence (AI) in education: Using AI tools for teaching and learning process"2021.