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THE ROLE OF ARTIFICIAL INTELLIGENCE IN SHAPING THE TRAJECTORY OF HIGHER EDUCATION

Oyuga Norman Anyinyo
Baku State University, Baku City, Azerbaijan
e-mail: anyinyo.norman@bsu.edu.az
ORCID 0009-0004-3864-7712

Abstract. Post-COVID, AI integration in higher education is vital. This study assesses AI's impact on instruction and administration, alongside its challenges and solutions. Findings show AI fosters individualized learning and efficiency, but creates issues like staff redundancy and data privacy concerns. The study recommends implementing AI governance frameworks and mandatory training.

Keywords: Artificial Intelligence, Adaptive Learning, Automation, Operational Efficiency, Ethical Concerns.

Introduction

The 21st century has seen a remarkable transformation in the education sector, driven by technological advancements such as computers, the internet, digital learning, and artificial intelligence (AI). Historically, despite having been around for nearly 60 years, it is just recently that Artificial Intelligence manifested in these forms; abundance to data, machine learning and economic access to computers. It is an era of astronomical data as every person leaves behind information footprints making it possible to quantify all activities around us hence the possibility of tracking, modelling and prediction [4]. The education sector definitely sits at the forefront of the impact of information footprints also referred to as “datafication”. Datafication comes with merits and demerits; the merits being the limitless possibilities of individualizing learning and education management while the demerits are the ethical concerns which need a concerted policy response. Given this ability to revolutionize learning, teaching and institutional management, these technologies should be used to enhance rather than hinder education. In higher education institutions, the impact of AI in promoting service delivery, efficiency in operations, generating innovative pedagogy, and adjusting to student needs has been significant [5].

Research has classified Artificial Intelligence into two types, namely knowledge-based AI, which represents the domain knowledge that a machine reasons on and the data-driven AI [4]. These classifications have the potential to significantly impact the operations of an educational institution, ranging from management processes to academic and research. Since AI applications become more accurate with more data so AI thrives on data. In scientific studies, AI can significantly support quality assurance by maintaining the consistency and integrity of scientific outcomes. A case in point is that a few decades ago, university professors would burn the midnight oil marking and assessing

the bulk of students' papers without a clear indication to ascertain whether students had copied from other sources. Recent years have experienced technological developments that can detect work that has been plagiarized and improve the educators' output on a greater scale. This paradigm shift has led to a modification in teaching methods to electronic ones, which can instantly detect malpractice, thus demonstrating the potential of educational innovations [2].

Notwithstanding the apparent benefits that come with the integration of AI in education as a way of boosting equity and quality of learning and to promote Sustainable Development Goal 4, there are documented challenges to it. Firstly, many countries lack a comprehensive public policy on AI for sustainable development. Secondly is the problem of ensuring inclusion and equity in AI in education, since AI can be fairly disruptive to the extent of deepening inequalities and divides among marginalised populations. Third is the problem of preparing teachers for AI-powered education, and also preparing AI to understand education systems. Fourth is the problem of developing quality and inclusive data systems which are complete, reliable and timely. Research on AI in education has not been given the attention it deserves to confirm its significance. Lastly is the problem of ethics and transparency of data collection, production, analysis and dissemination [4].

An intrinsic link exists between the future of higher education and the developments in new technologies and computing capacities of intelligent machines [5]. They warn that despite the new hype in the possibilities of application of AI in education, vigilance needs to be exercised so that the real limits of AI algorithmic solutions are not surpassed. Failure to observe these limits in the past has led to a motor industry accident when auto-pilot software was used and an AI chatbot that turned bigoted and racist on Twitter. Education, being a human-centric endeavour rather than a technology-centric solution, requires human identification of problems, critiquing, risk identification and raising questions relating to privacy, power structures, control and leaving room for unexpected paths in teaching and learning. Therefore, technology should be utilised for enhancing human thinking and augmenting the educational process instead of reducing it to a set of procedures for content delivery, control and evaluation [5].

Problem Statement

Worldwide, education systems are evolving rapidly to accommodate the advancements that result from the emergence of new technologies and Artificial Intelligence. The technological revolution characterised by Artificial Intelligence has impacted education and society to a large extent, evidently altering the teaching and learning processes and administrative work. Notwithstanding the impact that emerging technologies, specifically Artificial Intelligence, have had on higher education institutions, there remains a gap in how it can be used for strategic purposes,

pedagogical activities and institutional structures in higher education. This gap has impeded educational administrators and policymakers from decisively acting to adopt and implement AI. This paper, therefore, explores AI's current and future trends in higher education, identifying its transformative potential and challenges it may pose to academic integrity, fairness and quality.

Research Questions

The impact of AI in the world economy, not just in education, cannot be put into question, considering the largest investment ever made by Google in the European Union in 2014. Ever since, the major tech companies like Apple, Facebook, Microsoft, and Google continue to compete stiffly [5]. This wave of interest and investment has drawn attention to assessing the impact of AI in higher education institutions and the challenges of its integration. This study was guided by the following questions:

i. What is the impact of AI on instructional and administrative processes in higher education institutions?

ii. What are the challenges that emerge from the integration of AI in higher education institutions and their mitigation strategies?

Methodology

This study employed a qualitative research approach. Literature from secondary sources, including electronic articles already published, was carefully searched using keywords from the Google Scholar search engine, studied and used to develop this paper. The findings were analysed and discussed further.

Results and Discussions

5.1. Impact of AI on instructional and administrative processes in higher education institutions.

Firstly, with the emergence of AI, institutions are employing adaptive learning platforms that utilise tools, a case in point is Duolingo, which has the capability of responding to individualised student needs based on their speed and preferred time. The student gets instant feedback and customised recommendations on the next course of action [6]. Many mechanical, repetitive and monotonous activities can be automated by AI hence tutors get ample time for personalised attention to handle more complex cases that need human interaction, enabling many students to excel. A study in developing countries suggests AI-assisted technology can improve learning outcomes by analysing educational data and guiding policies on equity, inclusivity, quality, cost, and access to education. [4]. Artificial intelligence has paved the way for the designing of assistive technologies for people with disabilities to translate text-speech and vice versa, spell check, voice recognition, zoom capacity.

These solutions are found in wearable devices, hand-held devices or generic features in computers [5].

Another beneficial impact of AI in education is the upskilling of employees to become AI-ready. Employees who run the risk of joblessness due to automation have the opportunity to get training in the requisite skills to work alongside AI systems. AI can automate enrolment, grading, and student queries, with cases from Kenya, Kyrgyzstan, Chile, and the UAE demonstrating its importance in data analytics and informing policy. It can also be used for predictive purposes like retention, attrition, and admission rate control for strategic planning and resourcing [4].

AI is redefining research through the acceleration of data analysis, literature review and establishing trends [1]. The professors can examine students' scientific work, mark assignments and also detect plagiarised work and flag it for disciplinary action [2]. This can be done efficiently, hence saving the university huge amounts of resources and time since a large quantity of materials can be assessed swiftly. Additionally, the scrutiny of online learning environment currently shows applications like Turnitin, a plagiarism checker, that enable educators to perform administrative tasks that would have been tedious with ease.

Also, the limitation of geographical distance hindering learning is dealt with through the scalable online learning and translation of materials into global languages, enabling students to learn best within the context of their learning abilities. Domiciling learning resources on the internet and the World Wide Web has eased access to learning by people disadvantaged by national and international boundaries. Virtual reality and augmented reality promote both on-campus and distance education students [3, 2]. In addition, the off-campus professors can dial in or video conference using AI technology and still accomplish their duties and responsibilities without mandatory physical presence. This proliferation and advancement of AI has enabled instructors to discharge their duties more efficiently and effectively by leveraging technologies like robotics, audio-visual files, 3-D technology and virtual reality. Students also get richer and more individualised learning experiences [2].

Research from scholarly sources has shown that AI has been applied in learning institutions in a variety of ways, reflected in the automation of administrative procedures and duties, curriculum and content development, and teaching and learning sessions. This has made administrative processes more efficient, for example, reviewing students' assignments, grading and giving feedback through web-based platforms and computerised programs [2]. In fact, particular programs, for instance, Knewton ease the lecturers' work because they have a feedback mechanism for students based on their interaction on the platform, hence simplifying administrative tasks.

5.2. Challenges of the integration of AI in Higher Education Institutions and their mitigation strategies.

While AI comes with many benefits, it also brings challenges that must be addressed for sustainable educational impact. Utilisation of AI in traditionally human roles, like virtual assistants, has resulted in some workers becoming redundant or underemployed. AI systems like chatbots can automate student-teacher interaction, conduct assessments and guide the students throughout the learning period using collective intelligence [4].

Secondly, there is the problem of algorithmic biases. Computers process data based on the information that is input. Many educational institutions are using machine learning algorithms for admission purposes, to accept or reject students. The challenge is the lack of explainability that comes with machine learning because of the inability to state the reason for acceptance or rejection. This is causing a technological, economic and social divide. Furthermore, concerning access to educational institutions, machine learning algorithms can lead to unfair discrimination. For instance, if it is trained with a certain dataset, it may not favour students from other parts of the world equally [4]. To address this, the training data set should be customised to suit the target group so that a data set that suits European students, for instance, is not applied to African students.

Thirdly, the faculty members and staff need retooling and reorientation on digital skills. The introduction of open courses lowered entry requirements and fees charged, and this increased the enrolment rates drastically since students from all over the world could access universities provided they had an internet connection. Faculty members suffered from a lack of capacity to engage enormous class sizes from diverse global students residing in different time zones, whose progress rates, frames of reference and basic skills for the course of study are irregular [5]. Teaching, personalised attention and conducting assessments have been challenging for the educators. This calls for teachers' attitudinal change and, in return, course developers' understanding of teacher psychology and creating sustainable solutions for seamless implementation.

Lastly is the unethical use of AI in education and data misuse. With increasing amounts of data being collected by institutions, people have continued to become more suspicious of how that data is used afterwards in order to avert malpractices such as cyberattacks. This issue comes into play due to the delicate balance between using personal data while ensuring that personally identifiable information and individual privacy preferences are concealed. Also, the concentration of student-teacher personal data creates a privacy risk that cyber criminals take advantage of. Foolproof systems must be built by universities to thwart information abuse and misuse and maintain privacy. The

purpose and scope of any data collection exercise must also be clearly communicated so that people make more informed decisions before giving consent about personal data [4].

Conclusion and Recommendations.

Artificial intelligence (AI) is not only an enhancer of academic but also administrative and management processes in higher learning by accommodating adaptive learning platforms, task automation during enrollment, grading, et cetera, research acceleration and offering analytical predictions for efficient institutional planning and resource allocation. Furthermore, it boosts performance through data-centric policies that promote equity, inclusivity and access while addressing proximity issues via online and immersive technologies, for instance, virtual reality. Implementing strategic mitigation measures to ensure sustainability and equity in AI integration can solve a myriad of challenges like digital divides, job redundancy, faculty retooling and ethical concerns around data misuse and privacy. This study recommends that, for an ethical orientation, higher education institutions need to implement and adhere to policy frameworks for the use of AI in education. Further, these institutions should make AI literacy and regular faculty training mandatory.

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ALİ TƏHSİLİN TRAYEKTORİYASININ FORMALAŞMASINDA SUNİ İNTELEKTİNİN ROLU

Oyuga Norman Anyinyo
Baku State University, Baku City, Azerbaijan

Xülasə. Post-COVID dövründə süni intellektin (AI) ali təhsilə inteqrasiyası qaçılmazdır. Bu tədqiqat AI-nin tədris və inzibati proseslərə təsirini, həmçinin inteqrasiya problemlərini və həll yollarını araşdırır. Tədqiqat, AI-nin fərdiləşdirilmiş öyrənməyə, daha yaxşı nəticələrə və inzibati səmərəliliyə gətirib çıxardığını, lakin işçi ixtisarları, bərabərsizlik və məlumat məxfiliyi kimi çətinliklər yaratdığını müəyyən etdi. Buna görə də AI istifadəsini tənzimləyən çərçivələr və məcburi təlimlər tövsiyə olunur.

Açar sözlər: Süni intellekt, Adaptiv öyrənmə, avtomatlaşdırma, əməliyyat səmərəliliyi, etik narahatlıqlar.