

Chapter 10

Integrating Artificial Intelligence in Education for Sustainable Development

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ABSTRACT

A promising technology that has the potential to change many facets of the educational ecosystem is artificial intelligence (AI) which is playing a significant role in the actualization of the sustainable development goals (SDGs). The present status of AI in education was examined and identified significant areas for emerging research initiatives. Unified theory of acceptance and use of technology (UTAUT) underpinned the study to showcase ways AI technologies can be adopted and used for teaching and learning for a sustainable future. The study recommended the need for Africa as a continent to have a holistic AI ecosystem that captures our African histories, perceptions, idiosyncrasies, languages, outlooks, nuances, non-westernizations, etc., in addition to Nigeria being proactive to be the AI hub of the continent. The study is significant to educational practice, society, and policy and is theoretically based on a developing country perspective.

INTRODUCTION

The 21st century has witnessed a swift and unprecedented transformation in the field of education, primarily attributable to the technological progress of Artificial Intelligence (AI). Using its capacities for

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learning, reasoning, and decision-making, Artificial Intelligence (AI) has the potential to revolutionize the educational system for a sustainable future. One area where AI can have a big influence is personalized learning. AI-powered intelligent tutoring systems can adjust to the demands of each learner, providing individualized education and feedback. Meeting their specific learning needs raises student engagement and accomplishment which creates room for life-long learning that promotes sustainable development. Additionally, AI makes it possible for automatic grading and feedback, which lessens the workload on instructors and enables quicker and more accurate evaluation.

Asynchronous learning, in which students have more freedom to choose how they want to learn and can finish assignments at their own speed, has become more popular. This method can help students who have other obligations, disabilities or find it difficult to attend in-person classes because it lets them work when it is convenient for them. The digital gap, where students in low-income or rural locations might not have access to the technology or internet connectivity needed to fully participate in remote learning, has been brought to light by the transition to online learning. It also carried with it difficulties like a lack of motivation, accountability, and interaction (Baidoo-Anu and Ansah. 2023). In this wise, the application of AI to student learning has helped in assigning tasks based on individual competence, providing human-machine conversations, analyzing student work for feedback, and increasing adaptability and interactivity in digital environments. In teaching, it has helped in providing adaptive teaching strategies, enhancing teachers' ability to teach, and supporting teacher professional development. In administration, AI has helped in improving the performance of management platforms, providing convenient and personalized services, and supporting educational decision-making with evidence (Xia et al., 2023).

An intelligent virtual laboratory that meets the needs of students by assigning laboratory tasks at the appropriate level can be developed which provides an AI-based environment that can be used for personalised students learning. Similarly, an AI-integrated management system with augmented, virtual, and mixed reality technologies can be developed to monitor student learning progress for assigning adaptive tasks. Therefore, the interaction between humans and robots can make low-achieving pupils feel less ashamed and more capable, thus promoting an all-inclusive educational environment. Attendance and active engagement in class can also be measured by the facial recognition of each student; active participation can be enhanced by hearing each student's voice in the classroom or identifying each student's fingerprint at the door which is a veritable way of sensing, and detecting. In this instance, facial photos, fingerprints, and voice recognition can be used to feed data into machine algorithms to distinguish between teachers, pupils, and administrative staff. By including precise criteria, such as which students belong to which class and the stipulated session, the machine can determine whether a student is enrolled in that class or university. Depending on the specific academic activity allotted, the system demonstrates sufficient predictability on hourly, daily, or weekly basis.

Artificial Intelligence (AI) has enormous potential, but it also raises ethical issues and other fundamental issues that are core to the traditional pedagogical domain. Important factors to consider include protecting data privacy, mitigating algorithmic bias, and guaranteeing openness. To successfully integrate AI into teaching techniques, educators must get enough training and professional development which is lacking in most developing countries of which Nigeria is not an exception. Therefore, there is a need to examine these issues and build an enabling environment that leverages the advantages of AI in education, and cooperation among academics, policymakers, educators, developers, and the government to situate developing educational systems in contemporary AI discourse.

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