

EMBEDDING ARTIFICIAL INTELLIGENCE (AI) WITH EDUCATIONAL ASSESSMENT IN NIGERIAN TERTIARY INSTITUTIONS FOR SUSTAINABLE DEVELOPMENT

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Abstract

Quality human resources is needed for sustainable national development. Quality educational assessment is used to determine quality human resource for national development. Many lecturers in Nigerian tertiary institutions are still adept to the traditional assessment methods which are mundane, obsolete, and ineffective for higher order thinking. Artificial Intelligence (AI) is now Information and Communication Technology (ICT) innovative technique that is being used in educational assessment across the globe to replace the traditional assessment method. This paper deals with the meaning of AI, uses of AI in educational assessment, relevance of AI in test development process, challenges of AI in Nigeria educational assessment such as poor funding, low digital literacy among the lecturers, epileptic power supply in the country, reluctance to embrace new technology among some lecturers. The paper concludes that embedding AI with educational assessment in Nigerian tertiary institutions would go a long way in improving quality of educational assessment in determining quality human resource for sustainable national development. The paper recommends that lecturers should try as much as possible to embrace AI in their assessment practice. Universities' management should train lecturers from time to time on how to embrace this new technology in their assessment practices.

Keywords: Artificial intelligence, educational assessment, tertiary institutions, sustainable development

Introduction

Quality human resources is needed for the transformation of the country's economy. Good quality educational system holds the key to the development of quality human resource needed. As an essential component of education, assessment plays major roles on how students learn, their motivation to learn, how teachers teach, provision of information regarding teaching and learning (Udichukwu, Ugodulunwa & Mustapha, 2019).

Educational assessment can be defined as the process of using variety of measurement techniques to gauge, measure and keep records of students or learners' readiness, learning progress and acquisition of skills (Effrim, Owolabi & Akurtey-Titty, Andoh-Robertson, 2019). The importance of assessment in education is enormous. Assessment helps the students to see their progress, enables teachers to monitor their learners' progress as well as their teaching progress (Dunu & Mulvenon in Effrim et al, 2019). Available information gathered through assessment procedures assists the teachers to recognize the students' level of understanding, direct and redirect instructional processes, helps to identify concepts on which the students are doing well and provide diagnostic clues, helps in monitoring how the quality of a school system is, evaluate programme and policies of education, makes significant instructional placement decisions about learners and certify successful learners' accomplishment (Effrim, 2018).

Based on the mode of instruction, two types of assessment are formative and summative assessments. Formative assessment is always carried out during classroom instruction and its feedback can be used to adjust teaching and learning. Information obtained from formative assessment can be used to control the learning process and improve chances of success (Kakungulu, 2024). Formative assessment could be described as low-stakes because results cannot be used to validate conclusions about curricular standards and accountability. Summative assessment on the other hand is the kind of assessment that always come up at the end of instruction. Feedbacks from summative assessment are used to examine the worth of educational programme. Kakungulu (2024) described the summative assessment as high stakes tests and conclusions can be drawn about learners, teachers, curricular and schools.

Traditional assessment practice that have existed in this country for decades now is on sitting for a common and single written examination that sets the passing conditions of a course using the same evaluation criteria for all testees (Kakungulu, 2024). Kakungulu stressed that such written examinations assess students' knowledge on what had been presented to them throughout a specific course as well as their capacity to think and connect concepts presented in knowledge-based questions. It also assesses students' abilities of making calculations in calculation based questions. In addition, questions are usually mixed such that they vary in difficulty and content coverage. The current assessment methodologies are mundane, age-old, ineffective and not able to cope with the overwhelming changes in the students' pedagogy (Kakungulu, 2024). We are now in the digital era where Information and Communication Technology (ICT) are now applicable to virtually all areas of human endeavours such as health, commerce, industry, and education. ICT now allows people to do things differently from the ways they have been doing them before even in easier, effective, accurate and efficient manner.

ICT has wider applications nowadays in education for teaching, learning and assessment. The traditional age-long assessment practice is no longer relevant in this digital era. Artificial Intelligence (AI) is now ICT innovative tool that is being used in educational assessment to replace the traditional assessment system globally. This paper focuses on the meaning of AI, uses of AI in educational assessment, relevance of AI in test development process, challenges of deployment of AI in educational assessment in Nigeria and recommendation to overcome the numerous challenges of AI in educational assessment.

Concept of Artificial Intelligence (AI)

Artificial Intelligence (AI) simply refers to the aspect of technology that focuses on the adoption of machines to mimic human intelligence capable of performing human tasks. It refers to the creation of computer systems and machines designed to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, perception, and natural language understanding (AFSA, 2022). Naqvi (2020) defined AI as the field of computer science that involves creating computer programs capable of imitating intelligent behaviours and ideally enhancing human-like abilities. AI is already making an impact across multiple fields, including healthcare, finance, transportation, customer service, and education, with the potentials to revolutionize industries, increase efficiency, and generate new opportunities (AFSA, 2022).

Uses of Artificial Intelligence in Educational Assessment

Emergence of AI has revolutionized the field of education and educational assessment in particular. Owan, Abang, Idika, Etta and Basse (2023) have outlined various uses of AI tools in educational assessment. Some of the uses or applications are:

1. AI-powered adaptive learning software such as DreamBox and Knewton use data analysis to create personalized learning plans for students based on their strengths and weaknesses. Students can complete a pre-assessment test that generated a personalized learning plan with specific goals and recommendations.
2. AI-powered intelligent tutoring system software such as ALEKS, Carnegie learning and Knewton can be used by educators to provide individualized instruction, monitor student progress and identify areas where students need additional support.
3. AI can help automate the grading process, saving time for teachers and providing immediate feedback for students
4. AI is capable of analyzing students attendance, engagement and performance data to predict future outcomes
5. AI-powered natural language processing tools can enable educators to analyze and interpret natural language data, such as student essays and discussion to gain insight into student learning engagement
6. Learning Management System platforms can be used by educators to administer online assessment, monitor student progress and provide feedback on student performance.
7. Educators can use Automated Essay Scoring (AES) software to evaluate and grade essays and written assignments and provide feedback immediately.
8. CBT platforms allows educators to administer online assessment on various forms of objective tests and essay questions, assesses students knowledge, saves time on grading and provide students with immediate feedback
9. Formative assessment tools such as Mentimeter, Nearpod and Socrate enable educators to monitor students' learning in real-time, provide feedback and adjust instruction based on their performance
Digital portfolios enable students to collect and showcase their work, reflect on their learning and receive feedback from educators and peers
10. Classroom Response Systems allow educators to pose questions and receive real-time students feed back
11. Digital Assessment Tools provide educators with the ability to assess student knowledge and skills using a variety of question types such as multiple-choice, short answer and essay

Test Development Processes using Artificial Intelligence

Development of Large Language Models (LLMs) can be considered among the greatest breakthrough in AI. According to Owan et al (2023), LLMs can be applied in various stages of test development for:

1. Test purpose determination / specification
2. Development test blue print or table of specification
3. Test item generation or development
4. Preparation of test instruction
5. Item assembly or selection
6. Test administration
7. Test scoring
8. Interpretation of test results
9. Test analysis or appraisal
10. Reporting test scores

Challenges of Embedding Artificial Intelligence into Educational Assessment in Nigeria

Challenges of adopting AI in education generally and educational assessment in particular in Nigeria

are so numerous. Some of these challenges are:

Inadequate needed skills and awareness among teachers on how to effectively utilize AI. Most teachers are so adept to embrace new innovations. They prefer doing things in the way they are used to doing it in the past (Mafara & Abdullahi, 2024)

There is lack of adequate infrastructural facilities such as reliable internet connectivity and electricity that are needed for AI. Cost of data in Nigeria now is very high and electricity supply is epileptic (Mafara et al, 2024). Some rural areas in Nigeria are in total darkness nowadays. There is limited access to advanced technology among Nigerians (Salawu, 2020)

The costs of implementing and maintaining AI technology in Nigeria is very high, this may pose a very serious barrier for the average Nigerian teacher with meager salary (Nyirenda-Jere & Biru, 2015). Nyirenda-Jere et al further stressed that implementing AI system requires substantial investment in software, hardware and training of staff. Lack of funding of schools most especially public schools in Nigeria will be an impediment.

Low digital literacy among teachers is one of the impediments to proper integration of AI into educational assessment in schools in Nigeria. Teachers who are not well versed in using digital and AI-driven tools may not be able to incorporate them into their teaching, learning and even assessment practices (Edinoh, 2023)

Most AI systems are developed with a broad, global audience in mind without putting into consideration the unique cultural, linguistic and educational contexts of a particular region like Nigeria. Creating AI tools that support Nigerian languages and culture is still not common in Nigeria even the expertise that will interpret Nigerian culture and languages into AI are still in short supply (Edinoh, Oche & Adesola, 2024)

Lack of Government support and policy framework is another barrier to AI integration in Nigerian schools. Till date, there are no government policies or strategic plans designed to guide the adoption and implementation of AI technology in educational assessment in Nigeria (Edinoh et al , 2024). This vacuum gives schools and even teachers no clear direction on how to integrate AI into their assessment practices

There may be lack of motivation and engagement on the part of students since they may see the assessment as impersonal. Although there may be feedback to students, there won't be any avenue for remediation and support (Owan et al , 2023)

AI algorithms may be biased leading to inaccurate data which may result into inaccurate and unfair assessment of the students (Owan et al, 2023)

Most teachers are not assessment competency. They are lacking competency in test construction, administration, interpretation and scoring (Fehintola, 2022). Teachers that are lacking in basic assessment skills would find it extremely difficult to integrate AI into educational assessment.

Conclusion

AI has wider applications in educational assessment across the globe. It can be used for personalized learning, individualized instruction, grading of students, analyzing students performance, test development, administration, scoring and so on. Despite its numerous applications in educational assessment, it is being faced with numerous challenges in Nigeria like other developing countries. Some of the challenges of embedding AI into educational assessment in Nigeria are poor funding of schools, lack of basic infrastructural facilities, reluctance of embrace new innovations among the teachers, poor internet connectivity, epileptic power supply and so on. To overcome these numerous challenges, the following recommendations are made.

Recommendations

The author suggested that Government and school management in collaboration with relevant agencies should:

1. Develop AI-powered educational assessment tools that put into consideration the Nigerian languages and culture.
2. Embark on training and retraining of teachers on digital literacy and AI-driven educational assessment.
3. Provide instructional facilities such as internet and electricity to make deployment of AI easier.
4. Proper funding of schools. Substantial amount of annual budget should be devoted to the education sector
5. Promote the development of cost-effective, localized AI tools for educational assessment
6. Develop clear policies and frameworks for the smooth integration of AI into educational assessment
7. AI should be introduced to the curriculum of teacher training institutions in Nigeria because nobody cannot give what he doesn't have

References

- AFSA.(2022). Artificial intelligence and education. Retrieved May 20, 2024 from <https://www.theschoolleader.org/news/artificial-intelligence-and-education>
- Edinoh, K., Oche, I. G. O., Adesola, O. O. (2024). Adequate Funding: Panacea for Development of Early Child Care Education (ECCE) in Nigeria The International Journal of Leadership and Innovative Management (IJLIM). 1 (1), 1-11 Available online: <https://eminentpublishing.us/index.php/IJLIM>
- Edinoh, Kingsley (2023). Influence of social studies education on peace building and social stability among students of colleges of education in North-central Nigeria. Unpublished. Doctor of Philosophy (PhD) Thesis submitted to the school of post graduate studies, University of Abuja, Abuja, Nigeria.
- Effrim, Owolabi, Akurtey-Titty, & Andoh-Robertson (2019). Basic school teachers' knowledge and practices of school based assessment in Effutu municipality of the central region of Ghana. *ASSEREN Journal of Educational Research and Development*, 7, 44-54
- Fehintola, J. O. (2020). Senior secondary school teachers test construction skill and testing practices in Oyo state Nigeria. *African Journal for the Psychological Study of Social Issues*. 25 (3), 61-71
- Mafara, R. M., & Abdullahi, S. S. (2024). Adopting AI in education: challenges and possibilities. *Asian Journal of Advanced and Reports*, 18(2), 106-111.
- Nyirenda-Jere, T., & Biru, T. (2015). Internet development and internet governance in Africa. *Internet Society*
- Salawu, A. (2020). Introduction to the development and sustainability of African language. *Media* (pp. 1-12) Routledge
- Udouchukwu, N, A., Ugodulunwa, C. A., & Mustapha, Y.A. (2019). Diagnostic assessment of students' chemistry proficiency in Abuja the federal capital territory, Nigeria. *ASSEREN Journal of Educational Research and Development*, 7, 11-19