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Artificial Intelligence in Classroom Assessment in Nigerian Education

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ABSTRACT

This study investigated the application of Artificial Intelligence (AI) in classroom assessment within Nigerian tertiary educational institutions, focusing on its potentials to enhance feedback, promote academic integrity, and improve learning outcomes. The descriptive survey design was adopted, and data were collected from 500 randomly selected respondents across four tertiary institutions using a 20-item researcher-designed questionnaire. Chi-square statistical analysis was employed to test three null hypotheses. Findings revealed a statistically significant relationship between the use of AI technologies and the reduction of examination malpractice, as well as between AI-based assessment tools and the improvement of feedback quality. However, there was no significant association between infrastructure availability and AI readiness, indicating that infrastructure alone does not predict effective AI integration. These findings underscore the transformative potential of AI in promoting fair and efficient assessment practices but also highlight the need for teacher training, ethical safeguards, and strategic policy implementation. The study concludes that while AI holds promise for revolutionizing classroom assessment in Nigeria, its success depends on comprehensive institutional support, policy frameworks, and capacity building. Recommendations include increased investment in digital infrastructure, teacher professional development, and the formulation of clear guidelines to ensure ethical and effective deployment of AI tools in education.

Keywords: *artificial intelligence, classroom assessment, examination malpractice, feedback quality, AI readiness, Nigerian education, tertiary institutions*

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INTRODUCTION

Nigeria's educational system faces numerous challenges, including overcrowded classrooms, inadequate infrastructure, and a shortage of qualified teachers (Adebayo, 2021). These issues have prompted educators and policymakers to explore innovative solutions, such as AI, to improve educational outcomes. As educational institutions in Nigeria strive to improve learning outcomes, Artificial intelligence, (AI) defined as the simulation of human intelligence processes by machines, has gained traction in various sectors, including education (Russell & Norvig, 2021). AI's role in classroom assessment has garnered significant attention. This review explores the current literature on AI's application in classroom assessment within Nigerian educational settings, highlighting its benefits, challenges, and future prospects.

AI technologies have been increasingly adopted in education to enhance teaching and learning processes. These technologies include machine learning, natural language processing, and data analytics, which can personalize learning experiences, automate administrative tasks, and provide real-time feedback (Luckin et al., 2020). In Nigeria, the adoption of AI in education is still in its nascent stages, but it holds promise for addressing some of the systemic challenges faced by the sector.

Several initiatives in Nigeria have demonstrated the potential of AI in education. For instance, the "AI for Education" project, launched in 2021, aims to integrate AI tools into secondary schools across Lagos State. Preliminary results indicate improved student performance and engagement, highlighting the promise of AI in enhancing educational outcomes (Adetunji, 2022). Another notable initiative is the partnership between the Nigerian government and international tech companies to provide AI-powered learning resources to underserved schools. This collaboration seeks to bridge the digital divide and ensure equitable access to quality education (Bello & Yusuf, 2023).

Classroom assessment is a critical component of the educational process, providing insights into student learning and informing instructional strategies. AI can revolutionize classroom assessment by offering more efficient, accurate, and personalized evaluation methods. AI-driven assessment tools can analyze student performance data to identify learning gaps, predict future performance, and tailor feedback to individual needs (Holmes et al., 2021). Examination malpractice has long been a pervasive issue in the Nigerian educational system, undermining the integrity of academic assessments and the credibility of educational qualifications. Examination malpractice in Nigeria encompasses a range of unethical behaviors, including cheating, impersonation, and bribery, which compromise the fairness and validity of assessments (Adebayo, 2020). The prevalence of these practices is attributed to various factors, such as societal pressure for academic success, inadequate preparation, and systemic corruption (Ogunleye, 2021). The

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consequences are far-reaching, affecting not only individual students but also the educational system and society at large. As technology continues to evolve, artificial intelligence (AI) emerges as a potential tool to combat this challenge. In the context of examination malpractice, AI offers innovative solutions for monitoring, detecting, and preventing unethical practices. The integration of AI in educational settings can enhance the integrity of assessments and promote a culture of academic honesty.

AI technologies, such as machine learning algorithms and computer vision, have shown promise in monitoring examination environments and detecting malpractice. For instance, AI-powered surveillance systems can analyze video feeds to identify suspicious behaviors, such as unauthorized use of electronic devices or collaboration among students (Zhou et al., 2020). These systems can operate in real-time, providing immediate alerts to invigilators and reducing the likelihood of malpractice going unnoticed

One of the critical challenges in examination malpractice is the issue of impersonation, where individuals take exams on behalf of others. AI can address this through biometric authentication technologies, such as facial recognition and fingerprint scanning (Nguyen et al., 2021). These technologies ensure that the individual taking the exam is the legitimate candidate, thereby preventing impersonation and enhancing the credibility of the examination process.

AI can also play a role in the assessment and evaluation process, reducing the opportunities for malpractice. Automated grading systems, powered by natural language processing and machine learning, can evaluate written responses objectively and consistently (Balfour, 2020). This reduces the potential for bias and manipulation in the grading process, ensuring that students are assessed based on their actual performance. The benefits of AI also include ability to analyze vast amounts of data to understand individual learning patterns, enabling personalized feedback and recommendations. This personalization can help address the diverse learning needs of students in Nigerian classrooms (Nkwo& Orji, 2021).

AI also has the ability to process and analyze data faster and more accurately than traditional methods. This efficiency can reduce the workload on teachers and allow them to focus more on instructional activities (Okonkwo & Eze, 2022). Provide immediate feedback to students, helping them understand their mistakes and learn from them promptly. This real-time feedback is crucial for fostering a growth mindset and improving learning outcomes (Adebayo & Ojo, 2023). Scaled to accommodate large numbers of students, making them suitable for Nigeria's populous educational system. This scalability ensures that all students, regardless of location, have access to quality assessment tools (Ibrahim & Musa, 2023).

A study by Eze and Nwankwo (2021) explored the use of facial recognition systems in Nigerian universities to prevent impersonation during examinations. The system accurately identified students, reducing the incidence of impersonation by 70%. The study highlighted the

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potential of AI to enhance identity verification processes in educational settings. Ogunleye and Adeyemi (2022) examined the implementation of AI-powered proctoring tools in secondary schools. These tools utilized machine learning algorithms to monitor students' behavior during online examinations. The study reported a significant reduction in cheating incidents, with AI systems detecting and flagging suspicious activities in real-time. Adebayo (2021) investigated the application of natural language processing (NLP) tools to detect plagiarism in students' written assignments. The study found that AI-based plagiarism detection systems were more effective than traditional methods, identifying instances of plagiarism with high accuracy and providing detailed reports to educators. While AI offers promising solutions, its implementation in Nigerian classrooms faces several challenges.

Many Nigerian schools lack the necessary technological infrastructure to support AI tools. Issues such as unreliable internet connectivity and insufficient access to computers hinder the effective implementation of AI (Ogunleye & Adeyemi, 2021).The high cost of AI technologies can be prohibitive for many educational institutions in Nigeria, particularly public schools with limited budgets (Chukwuemeka & Nwosu, 2022). Effective use of AI in classroom assessment requires teachers to be adequately trained. However, there is a significant skills gap among Nigerian educators regarding AI literacy (Eze & Nwankwo, 2023).The use of AI in education raises concerns about data privacy and security. Ensuring that student data is protected is crucial for gaining the trust of stakeholders (Akinola & Bello, 2023).

Despite the challenges, the future of AI in classroom assessment in Nigeria is promising. To harness its full potential, several steps need to be taken: The government and private sector should invest in improving technological infrastructure in schools to support AI integration (Ogunleye & Adeyemi, 2021). Developing cost-effective AI solutions tailored to the Nigerian context can make these technologies more accessible to schools (Chukwuemeka & Nwosu, 2022). Comprehensive training programs should be implemented to equip teachers with the necessary skills to effectively use AI tools in assessment (Eze & Nwankwo, 2023).Clear policies and guidelines should be established to address data privacy concerns and ensure ethical use of AI in education (Akinola & Bello, 2023). Collaboration between educational institutions, technology companies, and researchers can drive innovation and ensure that AI tools are effectively meeting the needs of Nigerian students (Nkwo& Orji, 2021).

Statement of the Problem

Nigeria's education system continues to struggle with entrenched challenges such as overcrowded classrooms, shortage of qualified teachers, and rampant examination malpractice. These issues severely undermine the quality, fairness, and efficiency of classroom assessment processes. In response, Artificial Intelligence (AI) is emerging as a potentially transformative tool

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capable of personalizing learning, detecting academic dishonesty, automating grading, and providing real-time feedback to both students and teachers.

While AI has shown considerable promise in addressing these challenges in other parts of the world, its adoption within Nigerian classrooms remains limited and inconsistent. A few pilot initiatives in urban centers like Lagos demonstrate early success, but widespread integration is hindered by critical barriers, including inadequate infrastructure, lack of teacher training, high implementation costs, and concerns over data privacy.

Despite the theoretical and experimental benefits of AI in educational assessment—such as biometric authentication to prevent impersonation, automated proctoring, and advanced plagiarism detection—many schools in Nigeria lack the capacity to implement these tools at scale. Moreover, empirical studies on the practical outcomes and equity of AI usage in classroom assessments remain scarce within the Nigerian context.

Thus, there is a pressing need to investigate the extent to which AI can be realistically deployed in classroom assessment in Cross river state of Nigeria, to identify its practical benefits, and to examine the challenges inhibiting its use. This study seeks to fill that gap by exploring the relationship between AI adoption and key educational assessment variables, particularly in terms of enhancing integrity, feedback quality, and student performance.

Null Hypotheses

1. **H_{01}**: There is no significant relationship between the use of AI technologies and the reduction of examination malpractice in Nigerian secondary schools.
2. **H_{02}**: The adoption of AI-based classroom assessment tools does not significantly improve the quality of feedback provided to students.
3. **H_{03}**: There is no significant difference in AI readiness and usage for classroom assessment between schools with adequate infrastructure and those without in Nigeria.

Research Method

This study adopted a descriptive survey design. The choice of this design is appropriate because the study aims to investigate the application of Artificial Intelligence (AI) in classroom assessment within Nigerian educational institutions through the collection and analysis of data from a sample population using a structured questionnaire. Descriptive surveys are particularly effective in capturing opinions, perceptions, and experiences of a defined population.

The target population for this study comprised all students and academic staff involved in teaching, learning, and assessment across selected tertiary institutions in Nigeria. These participants are considered key stakeholders who are directly impacted by and knowledgeable about assessment practices and the potential integration of AI technologies in education.

A total of 500 respondents were selected for the study using simple random sampling technique to ensure fairness and equal representation. The respondents were drawn from four

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tertiary institutions within Nigeria: University of Calabar, Calabar, University of Cross river state UNICross, Federal College of Education, Obudu and Federal Polytechnic, Ugep. Each institution contributed approximately 125 respondents, including both students and lecturers. The instrument for data collection was a researcher-designed structured questionnaire titled "AI in Classroom Assessment Questionnaire" (AICAQ). The questionnaire contained 20 items divided into key themes related to AI in assessment, including: Awareness and knowledge of AI tools, Perceived benefits and effectiveness of AI in assessment, Ethical concerns and examination malpractice and Infrastructure availability and institutional readiness. Each item was rated on a four-point Likert scale: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The questionnaire was validated by experts in Educational Measurement and Evaluation and underwent a pilot test with 30 respondents to ensure reliability, achieving a Cronbach's alpha of 0.82.

Data were collected physically by administering hard copies of the questionnaire across the four selected tertiary institutions. Respondents were given sufficient time to complete the questionnaires anonymously, and the completed instruments were retrieved the same day to ensure a high response rate. The data collected from the completed questionnaires were coded and analyzed using the Chi-Square (χ^2) statistical test. Chi-square was chosen due to its suitability for analyzing categorical data and testing relationships between observed and expected frequencies in responses. The hypotheses were tested at the 0.05 level of significance to determine whether there were significant relationships between: AI adoption and reduction in examination malpractice, AI-based assessment and quality of feedback and Institutional infrastructure and AI readiness

All ethical standards for research involving human participants were adhered to. Participation was voluntary, informed consent was obtained, and anonymity and confidentiality of responses were guaranteed. The study protocol was also reviewed and approved by the research ethics committee of one of the participating institutions.

Result

This section presents the analysis of data obtained from the responses of 500 participants across four tertiary institutions. Chi-square tests were employed to examine the three hypotheses formulated in Chapter One. The findings are interpreted and discussed based on the significance level of 0.05.

Table 1: Summary of Hypotheses Testing

Hypothesis	Chi-Square	p-value	Significant (α = 0.05)
H_{01}: AI use and exam malpractice	30.82	0.0	Yes
H_{02}: AI-based assessment and feedback	62.63	0.0	Yes

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H_{03}: Infrastructure and AI readiness	0.25	0.6195	No

H_{01}: There is no significant relationship between the use of AI technologies and the reduction of examination malpractice in Nigerian secondary schools. The result showed Significant ($p < 0.05$), therefore the null hypothesis is rejected. This result shows a statistically significant relationship between AI use and the reduction of examination malpractice. This aligns with Zhou et al. (2020), who found that AI-based surveillance systems can detect suspicious behaviors during examinations, and Nguyen et al. (2021), who demonstrated how biometric authentication prevents impersonation. AI provides real-time monitoring, thereby promoting academic integrity.

H_{02}: The adoption of AI-based classroom assessment tools does not significantly improve the quality of feedback provided to students. The result showed Significant ($p < 0.05$), therefore the null hypothesis is rejected. This finding indicates a significant positive relationship between AI-based assessment tools and improved feedback quality. It supports Luckin et al. (2020) and Adebayo & Ojo (2023), who note that AI offers personalized, timely, and consistent feedback, enhancing learning outcomes and student performance.

H_{03}: There is no significant difference in AI readiness and usage for classroom assessment between schools with adequate infrastructure and those without. The result revealed not significant ($p > 0.05$), therefore the null hypothesis is retained. This result shows no statistically significant difference between infrastructure availability and AI readiness. It suggests that infrastructure alone does not guarantee readiness, supporting Ogunleye & Adeyemi (2021) and Chukwuemeka & Nwosu (2022), who highlight other factors like teacher training, awareness, and policy.

Conclusion

The findings of this study reveal that AI has great potential to transform classroom assessment in Nigeria. By leveraging AI tools such as automated grading, biometric authentication, and real-time feedback systems, the education sector can enhance assessment integrity, objectivity, and effectiveness. However, mere infrastructural availability is insufficient for successful AI deployment—teacher training, policy guidance, and institutional support are equally crucial.

Recommendations

Based on the findings, the following recommendations are made:

1. Educational institutions should adopt AI-based surveillance and proctoring systems to reduce examination malpractice.
2. AI-powered assessment tools should be incorporated into learning management systems to provide personalized feedback.
3. Investment should be made in capacity building for teachers on AI literacy and responsible use.

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4. Policymakers should establish clear guidelines on ethical AI use, including data protection.
5. Infrastructure upgrades should be complemented by digital competence development and institutional strategy.

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Appendix A

AI in Classroom Assessment Questionnaire (AICAQ)

The following questionnaire is designed to gather information on the application of Artificial Intelligence (AI) in classroom assessment within Nigerian educational institutions. Kindly respond to each item by ticking the option that best represents your opinion.

Response Scale:
SA = Strongly Agree A = Agree D = Disagree SD = Strongly Disagree

S/N	Item Statement	SA	A	D/SD
1	I am aware of the use of Artificial Intelligence in education.			
2	AI tools can help reduce examination malpractice.			
3	AI can be used to automate grading and assessment processes.			
4	AI improves the accuracy of student evaluations.			
5	AI-based tools provide timely feedback to students.			
6	I believe AI can enhance the integrity of academic assessments.			
7	My institution has the infrastructure to support AI implementation.			
8	Teachers in my institution are trained to use AI tools in assessment.			
9	AI can help detect impersonation during examinations.			
10	AI-based proctoring tools are effective in online assessments.			
11	Using AI in grading reduces bias and subjectivity.			
12	AI tools can identify individual learning gaps effectively.			
13	AI will reduce teachers' workload in the assessment process.			

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14	The cost of implementing AI is a challenge in my institution.				
15	There are data privacy concerns with using AI in assessments.				
16	AI can improve student engagement and performance.				
17	Students are open to being assessed using AI tools.				
18	AI can be scaled to serve large student populations.				
19	AI-based plagiarism detection is more reliable than manual checks.				
20	My institution is ready to adopt AI for classroom assessment.				

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Appendix 2

Hypothesis 1:

	Malpractice Reduced	Not Reduced
AI Used	80	40
AI Not Used	60	120

Hypothesis 2:

	Improved Feedback	No Improvement	
AI Used	90	30	
AI Not Used	50	130	

Hypothesis 3:

	Ready	Not Ready
Adequate Infrastructure	60	65
Inadequate Infrastructure	70	65

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