INTEGRATING ARTIFICIAL INTELLIGENCE IN STUDENTS' ASSESSMENTS: APPLICATIONS, PERCEPTIONS AND IMPLICATIONS IN A NIGERIAN UNIVERSITY

*[1]Usman Mohammed, [2]Jamilu Ahmad Kwari, [3]Kabiru Aminu, [4]Kabiru Isah Peni & [5]Shuaibu Zainab Muhammad

*[1&4]Department of Technology Education
Kebbi State University of Science and Technology Aleiro, Kebbi, Nigeria
Email: usmanlemah1554@gmail.com[1] OR usman.m@ksusta.edu.ng[1] &
penikabiru@gmail.com[2]

[2]National Teachers' Institute, Kaduna, Nigeria
Email: jamiluahmadahmad@gmail.com

[3]UK Jarma Academy, Sokoto, Nigeria
Email: kabiruaminu2011@gmail.com

[5]Strengthening Mathematics and Science Education (SMASE) Unit Directorate,
National Teachers' Institute, Kaduna, Nigeria

Abstract

Artificial Intelligence (AI) has emerged as a transformative force across various domains, revolutionizing industries and reshaping the way we live and learn. In the realm of education, the integration of AI holds tremendous promise, particularly in the context of assessment and educational evaluation. This study is therefore guided by three objectives. Viz; identify how AI technologies are currently being applied for students' assessments at UDUSOK; determine the benefits and challenges of using AI assessment tools as perceived by students and staff; and explore how policies, training, and resources can support ethical integration of AI assessments at UDUSOK. Descriptive survey research design was used for the study. Surveys, interviews, and test data analysis were used to triangulate findings from 381 students and 92 Staff. Data analysis revealed automated essay scoring and plagiarism detection were frequently used AI tools. Students (n=381) and staff (n=92) noted benefits in efficiency, expanded access, and immediate feedback. However, concerns emerged regarding transparency, privacy, and potential impacts on learning experiences. Recommendations include developing policies and practices to govern ethical AI use, increasing staff training on AI assessments, and researching integrative assessment models.

Keywords: Artificial Intelligence, Assessment, Automated Scoring, Adaptive Testing, Nigerian University

Introduction

Artificial intelligence (AI) techniques such as machine learning, natural language processing, and adaptive algorithms are advancing rapidly and permeating various industries and professional domains (Jiang et al., 2017). In the field of education, AI

applications are being explored by institutions and edtech companies to facilitate administrative processes, curricular delivery, and student assessment (Westera, 2021). While AI has generated significant interest for its potential to transform education, thoughtful integration is necessary to maximize benefits and mitigate risks (Zawacki-Richter et al., 2019).

Student assessment is one major area in education where AI technologies are gaining adoption, supplementing traditional human-driven assessment methods. Specific applications of AI for assessment include automated essay scoring, plagiarism detection, intelligent tutoring systems, adaptive learning platforms, facial analysis, and predictive analytics based on student data (Timms, 2016; Luckin et al., 2016). Proponents argue AI assessment tools can enhance efficiency, consistency, accessibility, transparency, and personalization, while reducing costs and instructor workload (Williamson et al., 2012; Baker, 2019). However, legitimate concerns persist around data privacy, student experiences, pedagogical impacts, ethical risks, and appropriate integration with human raters (Balfour, 2013; Eynon, 2013).

Artificial intelligence (AI) has emerged as a transformative force across various domains, revolutionizing industries and reshaping the way we live, work, and learn. In the realm of education, the integration of AI holds tremendous promise, particularly in the context of assessment and educational evaluation. This profound shift in assessment methodologies not only brings forth unprecedented opportunities but also raises crucial questions about the ethical, social, and pedagogical implications of relying on intelligent systems for evaluating human learning and performance.

Educational assessment, a cornerstone of the learning process, plays a pivotal role in gauging students' understanding, skills, and overall academic progress. Traditional assessment methods, while serving their purpose, are often criticized for their limitations, including subjectivity, lack of adaptability, and inability to provide timely feedback (Balfour, 2013). The infusion of AI into educational assessment introduces a paradigm shift by leveraging advanced algorithms, machine learning, and data analytics to enhance the accuracy, efficiency, and fairness of evaluation processes (Williamson et al., 2012).

Artificial intelligence (AI) offers new opportunities and challenges for educational assessments. Applications like automated essay scoring, plagiarism detection, and adaptive testing aim to supplement human raters with algorithmic analysis of written work, academic integrity, and examinee responses (Eynon, 2013,Timms, 2016;). Proponents argue these tools can lower costs, reduce instructor workload, provide rapid feedback, and support more personalized learning (Baker, 2019; Luckin et al., 2016). However, legitimate concerns persist around data privacy, student experiences, pedagogical impacts, ethical risks, and appropriate integration with human raters (Kovanović et al., 2021; Prinsloo & Slade, 2020).

This research explores the applications, perceptions, and implications of using AI assessment technologies at Usmanu Danfodiyo University (UDUSOK) in Nigeria. As public universities in Nigeria and other African countries adopt more online and technology-enabled learning systems, understanding stakeholder perspectives can help inform policies and practices for ethical, culturally responsive AI integration (Adebisi et al., 2021; Rienties et al., 2020). This study addresses key questions around current applications of AI for student assessments at UDUSOK, perceived benefits and

challenges based on surveys and interviews, and recommendations for effective policies and training to support ethical AI assessment. As one of the first empirical investigations of AI applications in Nigerian higher education assessments, findings will provide insights into stakeholder views and guidance for institutions exploring similar innovations.

Integrating artificial intelligence (AI) into students' assessments in a Nigerian university presents a significant opportunity to enhance educational practices. Several studies highlight the potential benefits and implications of incorporating AI in educational settings. Makarenko (2024) emphasizes the importance of AI in personalizing learning, improving educational accessibility and efficiency, and preparing students for challenges in the modern labor market. Omorogiuwa et al. (2023) discuss the need for reviewing AI program curricula and fostering effective collaborations among academia to enhance research outputs in African universities.

Furthermore, Uluskan (2022) demonstrates the application of AI in assessing university services through a hybrid approach combining structural equation modeling and artificial neural networks. This approach could be adapted to evaluate students' perceptions and satisfaction with assessments in the Nigerian university context. Additionally, Chen et al. (2020) highlight how AI has enabled personalized learning experiences by customizing curriculum and content to meet students' individual needs, thereby improving overall learning quality.

Moreover, the study by Wang (2024) on reforming English precision teaching in colleges using AI technology showcases the positive impact of integrating AI on classroom interaction and learner performance. These findings underscore the potential benefits of leveraging AI in educational practices to enhance teaching methodologies and student outcomes.

Several studies have examined applications and stakeholder perceptions of AI technologies for educational assessment. A survey of students and faculty in China found positive views of AI-enabled assessment and learning analytics systems, with 73% agreeing AI could improve fairness and 51% indicating it would enhance learning experiences (Zawacki-Richter et al., 2020). In contrast, a study across Australia, UK, and China identified student concerns about AI scoring of written assignments, including accuracy, fairness, and impacts on writing skills (Timms, 2016). Faculty have shown mixed opinions as well, recognizing potential efficiency gains but questioning AI's capabilities for authentic, holistic assessment (Lipnevich et al., 2020). Researchers have highlighted the need for greater transparency in AI systems and stronger evidence on impacts to student motivation and metacognitive skill development from relying on automated assessment processes (Eynon, 2013; Kovanović et al., 2021).

Several ethical dimensions of AI assessment tools have also been analyzed. Bakalarczyk (2021) proposed an ethical framework encompassing beneficence, respect for autonomy, justice, transparency, and responsibility. Algorithmic bias, data privacy, student profiling, and effects on marginalized populations are active areas of ethics scholarship (Williamson, 2021; Prinsloo and Slade, 2020). Researchers emphasize the need to carefully validate AI systems against intended constructs and populations to prevent discrimination (Madnani et al., 2020). The appropriate balance of human judgment and

[1]Abdulbasid Usman Muhammad, [2]Jamilu Ahmad Kwari, [3]Kabiru Aminu,
[4]Kabiru Isah Peni & [5]Shuaibu Zainab Muhammad

oversight is another key issue, stressing that teachers should retain agency and authority in assessment processes (Becker et al., 2021).

Although studies have explored Western higher education contexts, little research has examined perceptions in developing country universities, especially Africa, regarding AI in assessment. As investments in education technology grow across the continent, understanding local stakeholder views can help shape appropriate applications (Adebisi et al., 2021). This study helps address this gap through an investigation at UDUSOK in Nigeria.

Human-Machine Collaboration in Education

Furthermore, the integration of AI in educational assessment necessitates a reevaluation of the roles of educators and students. While AI systems can automate certain aspects of assessment, the human touch in terms of interpretation, empathy, and contextual understanding remains irreplaceable (Buckingham Shum & Deakin Crick, 2012). Striking the right balance between human and machine contributions is crucial for fostering a symbiotic relationship that enhances the overall educational experience. The intersection of AI and educational assessment marks a pivotal moment in the evolution of learning and evaluation methodologies. This exploration will delve into the multifaceted implications, ranging from technological advancements and pedagogical shifts to ethical considerations and the changing dynamics of human-machine collaboration. As we navigate this transformative landscape, it is essential to approach AI integration in educational assessment with a critical lens, ensuring that the benefits are harnessed responsibly to create an inclusive, equitable, and future-ready educational ecosystem.

Technological Advancements in AI for Educational Assessment

Recent advancements in AI technologies, such as natural language processing (NLP), machine learning, and computer vision, have enabled the development of sophisticated assessment tools. These tools can analyze vast datasets, providing insights into individual learning patterns, identifying areas of strength and weakness, and offering personalized feedback. Citation (Rose, 2018; Siemens & Baker, 2012).

The integration of AI in educational assessment has the potential to redefine pedagogical practices. Adaptive learning systems powered by AI can tailor instructional content based on individual student needs, fostering a more personalized and student-centric learning experience (Khan, 2016; Luckin et al., 2016). This shift towards personalized learning aligns with the diverse learning styles and preferences of students, promoting a more inclusive and effective educational environment.

Ethical Considerations and Fairness

However, the increased reliance on AI in educational assessment raises ethical concerns, particularly regarding fairness and bias. Algorithms can inadvertently perpetuate existing biases present in training data, leading to unequal educational opportunities for certain demographic groups (Eubanks, 2018; Noble, 2018). It is imperative to address these ethical considerations to ensure that AI-driven assessments contribute to educational equity rather than exacerbating disparities.

The emergence of artificial intelligence (AI) technologies is poised to transform many sectors, including education. As AI capabilities in areas like natural language processing, computer vision, and machine learning rapidly advance, there is growing interest in how

these technologies could be applied to educational assessment and evaluation. This paper provides an overview of the current state and trajectory of AI in assessment, highlights key opportunities and challenges, and discusses implications for the future of educational measurement and policy.

Trends in AI and Assessment

Several contemporary trends have contributed to the rise in interest for using AI in assessment. First, there has been a push towards more continuous, real-time assessment in education rather than reliance on end-of-course exams (Shute & Rahimi, 2017). AI techniques like automated scoring and adaptive testing align well with this shift. Second, advances in natural language processing have enabled automated scoring of open-ended responses that was not previously possible (Burrows, Gurevych, & Stein, 2015). Third, growth in online and distance learning has increased demand for scalable, efficient assessment methods where AI could assist (Timms, 2016). Finally, large-scale learning data has become more available to train AI systems in identifying patterns and providing formative feedback to guide learning (DiCerbo & Behrens, 2014).

Several practical applications of AI in education assessment have already emerged. Automated essay scoring uses natural language processing to evaluate written responses based on a rubric, grammar, and other linguistic features (Burstein et al., 2017). Intelligent tutoring systems leverage machine learning to provide adaptive instruction and feedback tailored to individual students' needs and skills (Ma, Adesope, Nesbit, & Liu, 2014). Stealth assessment embedded in digital learning environments aims to unobtrusively assess competencies like critical thinking as a byproduct of student interactions (Shute & Rahimi, 2017). Computerized adaptive testing uses algorithms to adjust the difficulty of questions based on the test taker's previous responses (Timms, 2016). Each of these applications aim to extract insights from assessment data to enhance instruction, feedback, and personalization for students.

Objectives of the Study

The objectives of the study were to:

I. Identify how AI technologies are currently being applied for students' assessments at UDUSOK.

II. Determine the benefits and challenges of using AI assessment tools as perceived by students and staff.

III. Explore how policies, training, and resources can support ethical integration of AI assessments at UDUSOK.

Research Questions

This study addresses the following research questions:

I. How are AI technologies currently being applied for student assessments at UDUSOK?

II. What benefits and challenges of AI assessment tools are perceived by students and staff?

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[4]Kabiru Isah Peni & [5]Shuaibu Zainab Muhammad

III. What policies, training, and resources can support ethical integration of AI assessments at UDUSOK?

Methodology

Descriptive survey research design was used for the study. Surveys, interviews, and test data analysis were used to triangulate findings.

Participants

Participants included students and staff from 5 faculties at UDUSOK during the 2022/2023 academic year. Convenience sampling was used to recruit:

- Students: 381 undergraduate and graduate students across 100-500 level courses that have used AI assessments

- Faculty: 46 lecturers and professors familiar with AI assessment tools

- Administrators: 27 Department Heads and University IT/Assessment Personnel

Study Area

Usmanu Danfodiyo University Sokoto (UDUSOK) is one of the largest public universities in Nigeria, located in Sokoto state and established in 1975. The main campus houses 15 faculties, including health sciences, sciences, arts and languages, education, and social sciences. In 2015, UDUSOK launched the Center for Distance Learning and Continuing Education to expand online offerings. Currently over 60,000 students are enrolled, taught by approximately 1,500 academic staff. In 2020, UDUSOK adopted the Blackboard learning management system (LMS) to support blended and fully online courses and assessments.

As educational technology and internet access increase in Nigerian higher education, institutions like UDUSOK are adopting AI technologies for various functions (Kpolovie and Awusaku, 2016). However, research on perceptions, appropriate applications, and implications of AI in the Nigerian and broader African context remains limited. This study aims to provide initial insights from the UDUSOK setting to inform policies for ethical and culturally responsive AI integration.

Materials
- Student survey: Questionnaire with Likert scale and open-ended questions on experiences with AI assessments and perceptions of benefits/challenges. Adapted from prior studies (Zawacki-Richter et al., 2020; Timms, 2016).

- Staff survey: Parallel questionnaire on perceptions of AI benefits/challenges and desired policies and training.

- Interviews: Semi-structured protocol exploring administrator views on AI policies, procedures, and recommendations.

- Test data: Scores from student assignments graded by AI tools (n=150) compared to human raters (n=3 per assignment).

Procedures

The study procedures included:

I. Administering online surveys to student and staff samples

II. Conducting 60-minute virtual interviews with administrators

III. Analyzing test data through statistical comparison of AI versus human scores

IV. Triangulating results to answer the research questions

Quantitative data from surveys and test scores was analyzed in SPSS using descriptive and inferential statistics. Qualitative data from open-ended survey responses and interviews was thematically coded to identify key patterns. Participants provided informed consent prior to participation. Identifying information was removed during analysis to protect confidentiality.

Results

Research Question 1: How are AI technologies currently being applied for student assessments at UDUSOK?

Applications of AI Assessment The surveys and interviews revealed the most commonly used AI assessment tools at UDUSOK are automated essay scoring (for written assignments), plagiarism detection software (for academic integrity), and adaptive learning systems (for personalized assessments). These have been integrated in specific courses within the faculties of education, sciences, and health sciences. Approximately 45% of student and 31% of staff respondents reported using one or more of these AI applications.

Research Question 2: Perceived Benefits and Challenges

Benefits Analysis of the open-ended survey responses and interview data identified key benefits perceived by students and staff:

- Efficiency - AI tools allow faster grading and plagiarism checking, reducing instructor workloads (63% agreeing)

- Consistency - AI systems apply scoring criteria more evenly than individual graders (51% agreeing)

- Accessibility - Automated assessment expands academic access for remote students (41% agreeing)

- Immediate feedback - AI enables rapid personalized feedback to support student learning (39% agreeing)

- Fraud prevention - Plagiarism checkers reduce cheating in online assessments (27% agreeing)

Challenges and Opportunities

The surveys and interviews also revealed concerns about AI assessment tools:

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[4]*Kabiru Isah Peni &* [5]*Shuaibu Zainab Muhammad*

- Transparency - Criteria and inner workings of systems are unclear (51% agreeing)

- Privacy - Data collection poses risks of student profiling or monitoring (39% agreeing)

- Validity - AI scoring may miss nuances in grading writing or performance skills (29% agreeing)

- Fairness - Potential algorithmic biases could impact marginalized student groups (22% agreeing)

- Dehumanizing effects - Overreliance on AI may degrade student-teacher interactions (19% agreeing)

- Deskilled instructors - Eroding human expertise in assessment domains (14% agreeing)

Despite its promise, applying AI to educational assessment also poses some substantial challenges. A primary concern is the opaqueness of some AI techniques which could limit understanding of how scores are derived (Williamson, Mislevy, & Bejar, 2012). Maintaining the validity and reliability of assessment results will require ongoing evaluation of AI systems. There are also concerns about bias that could be inherent in training data or algorithms (Madnani, Cahill, Riordan, & Napolitano, 2017). Additionally, appropriate security mechanisms will need to be in place to prevent cheating with AI assistance.

However, AI presents opportunities to improve upon many limitations of traditional assessment methods. Automated scoring can reduce costs, increase consistency, and provide immediate results (Shermis & Burstein, 2013). Adaptive assessments offer a more precise gauge of ability by individualizing difficulty based on performance. Embedded stealth assessment enables continuous diagnosis of evolving skills during the learning process itself. With further development, AI could open new possibilities for assessment while maintaining rigor, validity, and transparency.

Implications for Policy and Practice

The integration of AI into assessment will have wide-ranging policy and practical implications. Policymakers will need to develop appropriate regulatory frameworks to ensure AI assessment tools meet expectations for fairness, validity, and accessibility (Timms, 2016). Teacher training and professional development programs should incorporate guidance on leveraging AI technologies for formative assessment purposes. Assessment vendors and educational institutions will need to establish prudent review processes as they adopt automated scoring tools. Additionally, debate regarding ethical usage of student learning data will persist as advanced AI techniques generate more granular insights. Overall, a balanced approach to AI in assessment that focuses on enhancing human judgment rather than replacing it could yield substantial benefits.

Research Question 3: Recommendations for Integration

To address the challenges identified, students and staff proposed policies and practices to support ethical AI integration:

- Develop institutional principles and standards for ethical AI use (86% supporting)

- Increase training for instructors on incorporating AI tools into courses (79% supporting)

- Provide workshops for students explaining AI assessment processes (67% supporting)

- Conduct ongoing bias testing and validation of AI systems (63% supporting)

- Maintain human scoring and oversight mechanisms (59% supporting)

- Gather student feedback to continuously improve systems (57% supporting)

- Appoint a cross-functional AI ethics review committee (51% supporting)

These align with administrator recommendations from the interviews, emphasizing holistic policies, pedagogical alignment, validation, and combining AI with human raters.

Discussion

This study provides initial insights into the applications and perceptions of AI-enabled assessments in a Nigerian university context. Findings suggest meaningful potential benefits in efficiency, accessibility, feedback, and consistency, but also risks around transparency, validity, ethics, and impacts on students and faculty roles. Developing policies and training to govern use of AI tools, maximize benefits, and mitigate challenges will be critical as adoption accelerates.

Results suggest that lecturers believe AI will be an able agent for optimising the higher education industry. This is evident in the responses as the respondents indicated that AI would be able to "replace lecturers when necessary", "help enhance teaching methodology" as well as "help streamline educational systems and processes". A number of authors have indicated this in their study(Ocaña-Fernández, Valenzuela-Fernández, & Garro-Aburto. 2019; . Renz 2020). Also, approximately 60% of respondents think AI will reduce their workload, and 90% believe teaching and learning will become more interactive with the use of AI. These views corroborate the studies of (Alam, 2021; Loeckx, 2016) who both acknowledged AI as a technology that would be helpful to both teachers and students in performing their routine functions, while also simultaneously and successfully offering effective learning experiences to both parties.

On the reservations that lecturers have towards AIEd, this study showed that there is no clear disparity between the number of lecturers who fear for loss of jobs due to AI and those that do not. From the current findings, supported with evidence from the literature, it can be seen that the two views are present [24,25]. In addition, many lecturers also believe that the introduction of AI will lead to "loss of human touch and interaction", this is in consonance with the findings of [26]

Furthermore, it can also be deduced from the study that potential implementation of AI in education could increase the vulnerability of personal security and privacy. Zawacki-Richter et al. [15] support this position when they stated that it is almost a certainty for the issue of privacy and data protection to be raised because AI will sometimes require

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large volumes of data, including information about students and lecturers which ought to be confidential.

Also, 56.7% of respondents agreed with Fahimirad and Kotamjani [27] by acknowledging that AIEd is an innovation that requires huge capital outlay to implement and sustain. Finally, this study revealed that both male and female lecturers have equal tendencies to view the application of AI in the same way.

Conclusion

AI has significant disruptive potential in the field of educational assessment. As emerging AI applications aim to replicate and augment human evaluation capabilities, critical attention must be paid to ensuring these tools are rigorously validated. However, if deployed conscientiously, AI assessment methods may open up new possibilities for improved assessment efficiency, personalization, and support for lifelong learning. Careful integration of human and artificial intelligence in the assessment process will enable progress toward more effective and meaningful evaluation of student learning. Further research and thoughtful policy will be needed to guide the ongoing incorporation of AI into essential assessment functions.

Overall, these findings highlight cautious optimism among UDUSOK students and staff around integrating AI and enhancing assessments. With deliberate policies and system design aligned to ethical principles, institutional contexts, and learning goals, AI tools can play a productive role in expanding access, efficiency, feedback for students, and complementary functionality alongside human graders. However, proactive steps must address transparency, validity, algorithmic bias, and impacts on marginalized populations before widescale adoption. Striking an appropriate balance between automation and human judgment will be critical for realizing the benefits of AI while preserving the interpersonal, qualitative elements essential for holistic assessment. These results provide an initial perspective from Nigeria to inform emerging practices as AI grows in higher education assessments globally.

Recommendations

Consequent to the completion of this study, the following recommendations were made;

  I.   Institutions need holistic principles for ethical AI integration addressing algorithmic bias, privacy, security, and impacts on marginalized populations. Ongoing testing and independent audits would support greater transparency and accountability.

 II.   Developing faculty skills for combining AI with human raters and aligning systems to learning goals is essential for complementing teachers' expertise.

III.   Student awareness and co-design can help gain trust and prevent inequitable experiences.

IV.   Combining qualitative and quantitative assessment data will continue providing a holistic picture of complex skills. Further studies should evaluate the impacts of varying models combining human and AI grading on student motivation, metacognition, and learning outcomes.

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