

APPLICATION OF ARTIFICIAL INTELLIGENCE IN EDUCATIONAL ASSESSMENT AMONG POSTGRADUATE STUDENTS' AT NASARAWA STATE UNIVERSITY, KEFFI, NIGERIA

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Abstract

This study investigated application of artificial intelligence in educational assessment among post graduate students at Nasarawa State University, Keffi, Nigeria using descriptive survey research design. The study population consisted of 610 postgraduate students from the Faculty of Education, Nasarawa State University, Keffi. A sample of 300 students was selected through a simple random sampling technique. An unstructured questionnaire titled Applications of Artificial Intelligence in Educational Assessment (APAIEA) was used as the data-collection instrument. The instrument was subjected to experts in measurement and evaluation validity. Using Crombach alpha coefficient of reliability, a reliability coefficient of .78 was established. The study employed descriptive analysis, focusing on frequency and percentage distributions based on a Likert scale to assess awareness, usage, perceived benefits, and challenges associated with AI in educational assessment. The findings revealed that while a significant portion of respondents (68.7%) acknowledged awareness of AI tools that could aid in educational assessment; only 49.0% reported actually using them indicating a notable gap between awareness and practical application. Also, Respondents in this study reported significant perceived advantages of AI in enhancing educational assessment. Challenges such as limited training, difficulties in understanding AI tools, and concerns regarding data privacy were prevalent. This study concluded that addressing these challenges through targeted training programs and the establishment of ethical guidelines is crucial for effective AI integration in educational assessment. It was recommended that Nasarawa State University Keffi should incorporate AI training into the curricula to equip postgraduate students with essential skills for using AI tools in educational assessment. This can be achieved through workshops, seminars, and dedicated courses that enhance digital literacy thereby improving students' assessment capabilities as well as academic outcomes among other recommendations.

Keywords: Application, Artificial Intelligence, Educational Assessment, Postgraduate Students'

Introduction

In this 21st century, Artificial Intelligence (AI) is increasingly recognized as a transformative force in various fields, including education and research. The integration of AI technologies in educational contexts has opened new avenues for enhancing assessment, and fostering innovative approaches to learning and teaching. In recent years, AI applications such as machine learning, natural language processing, and predictive analytics have gained traction, enabling students to process vast amounts of data efficiently and derive meaningful insights (Russell & Norvig, 2021).

In Nigeria, the adoption of AI in educational assessment is still in its early stages, particularly among postgraduate students. While many students are aware of the potential benefits of AI tools in their assessment endeavors, there is a significant gap between awareness and actual usage. This discrepancy highlights the need for a deeper understanding of how AI applications can be effectively utilized to enhance the quality of educational assessment and address common challenges faced by postgraduate students.

AI refers to the creation of computer systems that can perform tasks typically requiring human intelligence, including problem-solving, learning, perception, language processing, and decision-

making (Russell & Norvig, 2021). AI systems leverage algorithms, machine learning models, and data analytics to analyze data, identify patterns, and make predictions or recommendations. These capabilities have made significant advancements across various sectors, including healthcare, business, and particularly in education.

The growing integration of AI into education is transforming traditional teaching and assessment methods. AI-powered assessments promise greater accuracy, adaptability, and scalability compared to conventional methods. These tools can tailor assessments to individual learners' needs, provide immediate feedback, and reduce the workload on educators, thus supporting a more personalized learning experience (Chattopadhyay et al., 2018). However, the application of AI in assessment raises critical concerns regarding data privacy, fairness, transparency, and the potential to replicate biases present in the training data.

AI technologies are being utilized in various forms within educational assessments, primarily focusing on three main areas: formative assessments, summative assessments, and adaptive testing. AI technologies are increasingly being utilized in diverse forms within educational assessments, spanning across a broad spectrum of applications. These technologies are primarily focused on three main areas, each serving a distinct purpose in the assessment process. Firstly, formative assessments employ AI to provide real-time feedback and personalized learning recommendations to students, enabling them to identify areas for improvement and refine their understanding of concepts. Secondly, summative assessments leverage AI's capabilities for automated grading and analysis, ensuring accuracy, consistency, and efficiency in evaluating students' performance. Thirdly, adaptive testing harnesses AI's potential to tailor assessment questions to individual students' abilities, dynamically adjusting the difficulty level based on their responses, thereby creating a more engaging and personalized assessment experience.

The theoretical framework for this study is based on several fundamental theories and models that help elucidate the applications of AI in educational assessment among postgraduate students at Nasarawa State University Keffi, Nasarawa State. These theories provide insights into the interplay between AI technology, educational practices, and student involvement in assessment. The Technology Acceptance Model (TAM) is a well-established Framework for examining user acceptance of technology. Introduced by Davis (1989), TAM suggests that two main factors influence individuals' decisions to adopt new technologies: perceived usefulness (PU) and perceived ease of use (PEOU).

i. Perceived Usefulness (PU): In this study, PU pertains to how much postgraduate students believe that AI tools can improve their assessment abilities and outcomes. This aligns with Venkatesh et al. (2016), who found that students are more inclined to use AI technologies when they perceive them as beneficial to their academic endeavors.

ii. Perceived Ease of Use (PEOU): PEOU refers to how easily students can understand and utilize AI tools. The more intuitive the technology is, the more likely students are to integrate it into their assessment activities. Addressing the obstacles related to comprehending AI tools is essential for enhancing student engagement with these applications.

Constructivist learning theory, articulated by theorists like Piaget and Vygotsky, highlights the importance of social interactions and experiences in the learning process. This framework posits that learners actively construct their knowledge through engagement with their surroundings. In this study, AI tools can promote assessment and enrich students' active learning experiences. By utilizing AI, students can delve deeper into their assessment activities, work alongside peers, and benefit from data analytics. This aligns with the findings of Ferguson (2019), who asserted that AI can foster interactive learning environments that support constructivist principles.

The Diffusion of Innovations Theory, proposed by Rogers (2003), examined how, why, and at what pace new ideas and technologies disseminate within a social system. This theory identifies several factors that affect the adoption of innovations, including perceived benefits, compatibility, complexity, trial ability, and observability. This framework is pertinent to the study as it emphasizes the importance of understanding how postgraduate students perceive and adopt AI tools

in their assessment practices. Factors such as the compatibility of AI technologies with existing assessment exercises and the perceived benefits of using AI in educational assessment are critical to the adoption process.

Shah (2022) observed a similar pattern among postgraduate students at universities in Pakistan. They noted that despite students' awareness of AI technologies, many lacked the skills or confidence necessary to apply these tools effectively in their research. Liu et al. (2021), who suggested that educational institutions frequently neglect to incorporate AI training into their curricula, leaving students unprepared to effectively utilize these tools in their studies. This absence of training creates a barrier to effective application, resulting in underutilization despite positive perceptions. Zhang and Zhang (2023) discovered that AI tools not only streamline assessment processes but also enhance data collection for assessment, leading to stronger outcomes. Khan and Zia (2020) highlighted that AI's capacity to efficiently provide large datasets allows students to concentrate on higher-order cognitive tasks. This underscores the potential of integrating AI into educational assessment to significantly improve productivity and the quality of assessment. Ogunleye (2023) for enhanced curricula that make AI literacy a core component of postgraduate education. Furthermore, as emphasized by Hwang et al. (2023), cultivating a culture of innovation and support can greatly influence students' willingness to adopt AI technologies.

At the Nasarawa State University Keffi, the Faculty of Education is home to a diverse group of postgraduate students who are engaged in various assessments. Understanding how these students perceive and utilize AI tools is critical for identifying both the opportunities and challenges associated with AI integration in their academic pursuits. Despite the potential of AI to improve assessment efficiency, accuracy, and overall outcomes, there are concerns regarding accessibility, training, and ethical considerations related to data privacy. On the other hand, the application of AI in educational assessment presents new challenges that postgraduate students must navigate. These include the technical complexities associated with learning how to use AI tools effectively, ethical considerations related to data privacy and algorithmic bias, and access to adequate computational resources (Zhou, 2021). Despite these challenges, AI has the potential to transform educational assessment, enabling postgraduate students to produce high-quality, data-driven insights that can contribute to academic progress. The rapid evolution of AI technologies has significantly impacted various sectors, including education. AI is no longer limited to fields like computer science or engineering; it has permeated educational assessment, revolutionizing the ways assessment is undertaking. In the context of postgraduate education, where rigorous assessments are essential, the application of AI tools has become particularly valuable (Hansen, 2024).

The rapid development of AI technologies has the potential to greatly enhance educational assessment by streamlining assessment processes, and delivering valuable insights. Several benefits of AI implementation in educational assessments have been identified. AI systems can personalize assessments based on individual student needs, learning styles, and progress. The potential to tailor questions and difficulty levels to suit the learner's current capability enhances engagement and learning outcomes (Miserandino, 2024). AI reduces the time and resources required for grading and evaluating student performance. It enables teachers to focus more on instructional tasks, as noted by Owan et al. (2023). AI systems can efficiently process large datasets, allowing for quick insights into overall class performance and individual progress. AI-powered assessment tools can scale easily, making them applicable to both small classroom settings and large-scale standardized tests. This is particularly valuable in contexts where educational resources are limited (Chattopadhyay et al., 2018).

However, despite these acknowledged advantages, postgraduate students at Nasarawa State University, Keffi, encounter several challenges that need to be addressed in order to fully harness the potential of AI in educational assessments. First, while many students are aware of various AI applications, there exists a significant gap between this awareness and their actual usage. This disconnects prompts questions about the factors influencing students' adoption of AI tools and the barriers they face.

Second, insufficient training and support concerning AI technologies can impede students' ability to incorporate these tools into their educational assessment. Many postgraduate students may lack the skills needed to navigate and effectively use AI applications, resulting in underutilization of resources that could improve the quality of their assessments.

Third, one of the most significant challenges is bias. AI algorithms can be biased against certain groups of students, such as students from minority backgrounds or students with disabilities (Gonzalez-Calatayud et al, 2021). It is important to ensure that AI-powered assessment tools are fair and unbiased, so that all students have an equal opportunity to succeed.

Fourth, the concerns about data privacy and ethical considerations present substantial challenges to the adoption of AI in educational assessment. Students may feel apprehensive about how their data is managed and the potential implications of using AI tools, which can further discourage them from engaging with these technologies. Furthermore, AI-powered assessment tools collect a large amount of data about students, including their responses to questions, their browsing history, and their online interactions. It is important to ensure that this data is protected from unauthorized access and use, and that students' privacy is respected.

Finally, there is the challenge of interpretability. AI algorithms can be complex and difficult to understand, which can make it difficult to interpret the results of AI-powered assessments. It is important to ensure that AI-powered assessment tools are transparent and interpretable, so that educators and students can understand how they work and make informed decisions about their use. Addressing these challenges through collaborative research and ethical guidelines is crucial to harness AI's full potential in education.

Given these challenges, it is crucial to explore how postgraduate students at Nasarawa State University perceive and utilize AI in their educational assessment. Gaining insights into their experiences, perceived benefits, and obstacles will help inform strategies for the effective integration of AI into academic practices and enhance training and support systems. This study intends to explore the implications of AI applications in educational assessment among postgraduate students at Nasarawa State University, Keffi. By examining students' awareness, usage patterns, perceived benefits, and challenges related to AI tools, the research seeks to provide insights into how these technologies can be better integrated into educational assessment practices. Ultimately, the findings will inform strategies to enhance the assessment capabilities of postgraduate students, ensuring they can leverage AI effectively in their academic work and contribute to the broader landscape of educational assessment in Nigeria.

Objectives

This study examined the application of AI in educational research among postgraduate students at Nasarawa State University, Keffi. The specific objectives of this study are:

- i. Investigate the level of awareness and understanding of AI tools available for educational assessment among postgraduate students of the Faculty of Education, Nasarawa State University, Keffi.
- ii. Analyze the perceived benefits of AI applications in educational assessment among postgraduate students of the Faculty of Education, Nasarawa State University, Keffi

Methods

This study employed descriptive survey research design. The study population consisted of 610 postgraduate students from the Faculty of Education of Nasarawa State University, Keffi. A sample of 300 students was selected through a simple random sampling technique.

An unstructured questionnaire, titled Applications of Artificial Intelligence in Educational Assessment (APAIEA), was used as the data collection instrument. Validity and reliability indices of .90 and .76 were achieved using construct validity and Cronbach's alpha coefficient of reliability.

The study employed descriptive analysis, focusing on frequency and percentage distributions based on a Likert scale to assess awareness, usage, perceived benefits, and challenges associated with AI in educational assessment.

Results

Research Question 1: What is the level of awareness and understanding of AI tools available for educational assessment among postgraduate students in the Faculty of Education at Nasarawa State University, Keffi?

Table 1

Awareness and Usage of AI Tools by Postgraduate Students

Statement	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)
I am aware of AI tools that can help in educational assessment.	9 (3.0)	34 (11.3)	51 (17.0)	140 (46.7)	66 (22.0)
I have used AI tools for my assessment.	35 (11.7)	43 (14.3)	75 (25.0)	95 (31.7)	52 (17.3)

Table 1 shows that majority of respondents (68.7%) reported being aware of AI tools that can help in educational assessment, with 68.7% either agreeing or strongly agreeing. However, the usage of AI tools was relatively low, with only 49.0% of respondents indicating that they had used such tools in their research. This disparity between awareness and usage suggests a need for enhanced training and support to bridge the gap.

Research Question 2: What are the benefits of AI applications in educational assessment among postgraduate students in the Faculty of Education at Nasarawa State University, Keffi?

Table 2

Perceived Benefits of AI by Postgraduate Students

Statement	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)
AI enhances the efficiency of my assessment process.	3 (1.0)	7 (2.3)	40 (13.3)	130 (43.3)	120 (40.0)
AI provides personalized feedback.	5 (1.7)	9 (3.0)	49 (16.3)	132 (44.0)	105 (35.0)
AI reduces time and resources for my assessment.	4 (1.3)	11 (3.7)	41 (13.7)	145 (48.3)	99 (33.0)

Table 2 shows that significant proportion of respondents (83.3%) agreed or strongly agreed that AI enhances the efficiency of their research processes, indicating a positive perception of AI's role in facilitating assessment tasks. Similarly, a substantial number (79.0%) acknowledged that AI provides personalized feedback, highlighting its potential to enhance assessment quality base on individual student needs, learning styles and progress. Also, 81.3% respondents agreed and strongly agreed that AI reduces time and resources. The results suggest that while students recognize the advantages of AI, there may still be gaps in their practical application, possibly due to a lack of training or familiarity with AI tools.

Discussion of Findings

The results of this study emphasize several key aspects related to the applications of AI in educational research among postgraduate students of the faculty of education at Nasarawa State University, Keffi (NSUK). The analysis indicates a notable awareness of AI tools, alongside considerable challenges that impede their effective utilization. This discussion situates the findings within the broader context of existing literature.

The study revealed that while a significant portion of respondents (68.7%) acknowledged awareness of AI tools that could aid in educational assessment, only 49.0% reported actually using them. This gap mirrors findings from Shah et al. (2022), who observed a similar pattern among postgraduate students at universities in Pakistan. They noted that despite students' awareness of AI technologies, many lacked the skills or confidence necessary to apply these tools effectively in their assessment. The divide between awareness and practical application may be attributed to a shortage of comprehensive training programs, as argued by Liu et al. (2021), who suggested that educational institutions frequently neglect to incorporate AI training into their curricula, leaving students unprepared to effectively utilize these tools in their studies. This absence of training creates a barrier to effective application, resulting in underutilization despite positive perceptions.

Respondents in this study reported significant perceived advantages of AI, including improvements in efficiency (83.3%), personalized feedback (79.0%), and reduces time and resources required for assessment (81.3%). These results support the findings of Zhang and Zhang (2023), who examined the influence of AI on assessment practices in higher education. They discovered that AI tools not only streamline assessment processes but also enhance data collection for assessment and provides personalized feedback, leading to stronger assessment outcomes. The favorable perception of AI's advantages aligns with the research of Khan and Zia (2020), which highlighted that AI's capacity to efficiently process large datasets allows students to concentrate on higher-order cognitive tasks. This underscores the potential of integrating AI into assessment to significantly improve productivity and the quality of assessment. The findings suggest a pressing need for educational institutions to bridge the gap between awareness and practical application of AI tools. Institutions should consider incorporating AI training into their academic programs to equip students with the skills and confidence needed to effectively use these tools. This recommendation aligns with the advocacy of Ogunleye et al. (2023) for enhanced curricula that make AI literacy a core component of postgraduate education. Furthermore, as emphasized by Hwang et al. (2023), cultivating a culture of innovation and support can greatly influence students' willingness to adopt AI technologies. By fostering an environment that encourages exploration and experimentation with AI tools, educational institutions can empower students to effectively leverage these technologies in their research.

Conclusion and Recommendations

This study examined the applications of AI in educational assessment among postgraduate students at Nasarawa State University, Keffi (NSUK). The findings indicated a significant awareness of AI tools among respondents, coupled with a strong acknowledgment of their potential benefits in enhancing assessment efficiency and accuracy. However, the study also identified notable challenges, including limited practical usage, insufficient training, and concerns about data privacy, which hindered students from fully integrating AI into their assessment practices. The results align with existing literature, underscoring the necessity for educational institutions to bridge the gap between awareness and practical application of AI technologies. By addressing these barriers, institutions can empower students to leverage AI effectively in their academic endeavors, thereby enriching their educational experiences and fostering innovative assessment.

Based on the findings and conclusions of this study, the following recommendations were made:

1. Nasarawa State University Keffi should incorporate AI training into the curricula to equip postgraduate students with essential skills for using AI tools in educational assessment. This can be achieved through workshops, seminars, and dedicated courses that enhance digital literacy.
2. Nasarawa State University Keffi should create a supportive learning environment where faculty provide guidance and resources to encourage students to confidently experiment with AI applications in their educational assessment.

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