LECTURERS' PERCEPTIONS, READINESS AND CHALLENGES IN INTEGRATING ARTIFICIAL INTELLIGENCE FOR INSTRUCTION IN KANO STATE COLLEGES OF EDUCATION

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Abstract

The study investigated the lecturers' perceptions, readiness and challenges in adopting AI tools for instruction in Colleges of Education in Kano State. A descriptive survey design was employed. A researcher-made questionnaire titled "Lecturers' Perception, Readiness and Challenges of Artificial Intelligence Tools Questionnaire (LPRCAITQ)" was used for data collection. The Data collected were analyzed with the use of both descriptive and inferential statistical tools. The findings revealed that lecturers in Colleges of Education Kano State have positive percieption on ethical consideration for adopting AI tools in teaching. The study further revealed some of the challenges confronting lecturers in the effective adoption of AI tools. The finding also revealed a significant relationship between the lecturer's perception and readiness to integrate AI tools for teaching. The study recommendation which include increased funding, enhanced training programs for lecturers, and research initiatives. The study concluded that while AI ethical framework has the potential to transform teaching and learning in Nigerian Colleges of Education, addressing infrastructural, training, and ethical challenges is essential for successful integration. The study recommended that institutions should invest in AI infrastructure, provide targeted training for lecturers, develop clear ethical guidelines and foster collaboration between AI developers and educators.

Keywords: Artificial Intelligence, Lecturers' Perception, Readiness, Ethical Considerations, Challenges, Colleges of Education, Kano State

Introduction

The advent of Artificial Intelligence (AI) has significantly influenced various fields, including education, which has seen a transformative shift towards more automated, efficient, and personalized teaching and learning processes. AI, in the context of education, encompasses technologies such as machine learning, natural language processing, and data analytics, which are applied to optimize instructional methods and provide real-time feedback for students and teachers alike. As these technologies continue to evolve, they are poised to redefine the educational landscape, especially in higher education institutions, including Colleges of Education.

AI's integration into education has become pivotal in the development of intelligent learning environments. Its ability to support personalized learning experiences allows for tailored teaching interventions based on individual student needs. The use of AI-powered tools in education not only enhances students' learning outcomes but also assists educators in delivering content more effectively, analysing students' progress, and predicting future learning trends. For example, AI-based learning management systems can track student progress and provide personalized recommendations for improving academic performance (Ahuja & Bala, 2021). Furthermore, AI-based systems can assist in grading assignments, thereby reducing the

administrative burden on educators and providing immediate feedback to students, an essential component of the modern educational experience (Celik, 2022).

AI's role in the instructional process is also marked by its potential to enhance the interaction between teachers and students. The integration of AI tools like chatbots, virtual assistants, and intelligent tutoring systems allows students to receive support outside of traditional class hours. These tools facilitate self-regulated learning, where students can set goals, seek feedback, and adjust their learning strategies based on real-time data provided by AI systems (Chang et al., 2023). Additionally, AI's ability to process large amounts of data allows for the analysis of student behaviours, helping educators identify learning gaps and intervene proactively (González-Calatayud et al., 2021). This ability to personalize learning experiences is particularly important in the context of the diverse academic backgrounds of students in Colleges of Education.

As artificial intelligence (AI) becomes increasingly integrated into educational settings, the need for a robust ethical framework to guide its implementation and use is critical. A growing body of literature explores the intersection of AI, ethics, and instruction, focusing on fairness, accountability, transparency, and student autonomy. Existing frameworks, such as those proposed by Organization for Economic Cooperation and Development (OECD, 2021) and United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021), emphasize principles like: Transparency (understanding how AI makes decisions),Accountability (clear responsibility for AI decisions),Privacy & Data Protection, and Non-discrimination (avoiding bias in educational AI systems).These principles are being adapted to educational contexts, stressing the importance of student-centric and inclusive practices (Holmes et al., 2022). Floridi et al. (2018) propose a multi-level ethical AI framework: i. Ethical design (building ethics into the algorithm), ii Ethical deployment (responsible use), and iii Ethical impact (monitoring long-term effects).Holmes, Bialik, and Fadel (2022) apply these principles to education, arguing that AI systems must prioritize student well-being, promote fairness, and support inclusive learning environments. Ethical AI in instruction should reinforce, rather than replace, the role of educators.

In the Nigerian context, the adoption of AI in Colleges of Education has been slow, largely due to challenges such as inadequate infrastructure, lack of training for educators and resistance to change from traditional teaching methods (Siddiqui et al., 2025). However, the application of AI in instructional processes has been limited by several challenges. One of the key issues is the lack of awareness and understanding of AI technologies among educators, who often remain unfamiliar with the potential applications of AI tools in teaching assessment (Celik et al., 2022).

According to Owan et al. (2023) opined those challenges included inadequate infrastructure, lack of training, and resistance to technological change. Similarly, Yue et al. (2022) found that technology-based instruction had the potential to improve the accuracy and efficiency of grading, there were significant barriers to adoption, including limited access to reliable internet, insufficient training, and a general resistance to change among faculty members. Also, Celik et al. (2022) highlighted those limitations, such as the high cost of implementing AI systems, the need for ongoing teacher training, and ethical concerns about data privacy. Lombardi et al. (2025) Identified concerns related to the potential for teacher-student relationship disruption, the risk of over-reliance on technology, and the difficulty in adapting AI systems to diverse educational contexts.

Gender plays a critical role in shaping how lecturers interact with artificial intelligence (AI) tools for teaching and instructional assessment in colleges of education. Across Nigeria and globally, research has shown that men and women differ in their technological confidence, usage patterns, and openness to adopting emerging tools in educational contexts (Chen, Chen, & Lin, 2020). Studies from UNESCO (2023) reveal that gender disparity remains visible in digital literacy and access, with women educators often facing

socio-cultural and infrastructural barriers to using technology effectively in teaching (UNESCO, 2023). In the context of Kano State, where gender norms still influence access to professional training and technology ownership, female lecturers may encounter challenges that affect their integration of AI-based tools in instructional delivery (Ahuja & Bala, 2021).

Globally, male educators have often been found to demonstrate higher self-efficacy and technical confidence when engaging with AI-supported systems, while female educators are more cautious due to limited exposure and lower institutional support (Celik et al., 2022). This gendered digital divide can hinder equal participation in AI-driven instructional innovation, particularly when training opportunities are unevenly distributed (Casal-Otero et al., 2023). However, when female lecturers are given structured capacity-building programs, mentorship and collaborative environments, their AI readiness and creative application in teaching significantly improve (Kim, 2023). This highlights that the gender gap is not due to inherent ability differences but structural inequities and historical barriers that shape educational access and professional development (Chan, 2023).

Academic qualification significantly determines how effectively lecturers adopt and utilize AI for instructional and assessment purposes. Studies across tertiary institutions suggest that educators with higher academic qualifications, such as master's and doctoral degrees, tend to exhibit stronger digital literacy and greater openness to integrating AI into teaching practice (Chen, Chen, & Lin, 2020). These lecturers often engage with AI not only as a tool but as a transformative pedagogical partner that enhances student centered learning (Celik, 2022). In Kano State colleges of education, the disparity in academic qualifications among lecturers affects their readiness to use AI tools, as many still rely on traditional pedagogical approaches with limited exposure to educational technologies (Ahuja & Bala, 2021).

Statement of the Problem

Despite the growing global adoption of artificial intelligence (AI) tools to enhance instructional delivery in higher education, their integration in Nigerian teacher education institutions remains limited and uneven. Although studies indicate that lecturers generally perceive AI as useful for improving teaching effectiveness, actual instructional use is constrained by low institutional readiness, inadequate ICT infrastructure, limited professional development opportunities, unreliable power supply, and the absence of clear ethical and policy frameworks guiding AI use (Eleje et al., 2025; Mahuta, 2024). These challenges are particularly pronounced in Colleges of Education, which play a critical role in preparing future teachers but often receive less technological and financial support than universities. In Kano State, there is a notable lack of empirical evidence on lecturers' perception, readiness, and challenges in integrating AI tools for instruction in Colleges of Education, making it difficult for policymakers and administrators to design informed and context-specific interventions. Consequently, without a clear understanding of these factors, the potential of AI to improve instructional quality and teacher preparation in Colleges of Education in Kano State remains largely unrealized. It's in the light of the above, the researcherssought to investigate the level of perception, readiness and challenges of integrating artificial intelligence (AI) tools among lecturers in Colleges of Education Kano State, Nigeria.

Purpose of the Study

The main purpose of this study is to explores lecturers' perceptions, readiness, and challenges in adopting AI tools for instruction in Colleges of Education in Kano State, Nigeria. Specifically, the study is designed to:

i. Explore lecturers' perceptions of the ethical issues associated with using AI for teaching and assessment in Colleges of Education in Kano State;
ii. Examine lecturers' readiness to integrate Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State;

iii. To Identify the challenges faced by the lecturers in integrating Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State.

Research Questions

i. How do lecturers perceive the ethical concerns associated with AI integration in teaching and assessment in Colleges of Education in Kano State?
ii. How ready are lecturers to integrate Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State?
iii. What are the challenges faced by lecturers in integrating Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State?

Hypotheses

The following research hypothesis was formulated and tested at 0.05 level of significance.

Ho_1: There is no significant relationship between lecturers' perception of the benefits of AI and their readiness to adopt AI in teaching and assessment in Colleges of Education in Kano State**.**

Method

The study employed a descriptive survey research design. The descriptive survey design is chosen as it is appropriate for gathering information about a population's characteristics, behaviors. The survey design allows for the collection of data that provides a snapshot of the current state of AI adoption in teaching in Nigerian Colleges of Education, with a focus on lecturers' perceptions, readiness and challenges in using AI-based tools. The population of this study consisted of all the lecturers in public Colleges of Education (both Federal and State-owned Colleges) in Kano State. The sample size consisted of 335 lecturers randomly selected from the one Federal College of Education and two State-owned Colleges of Education in Kano State. Data was collected using a self-developed questionnaire titled "*Lecturers' Perception, Readiness and Challenges of Artificial Intelligence Tools Questionnaire (LPRCAITQ)*", which consisted of four sections (A-D). Section A gathered demographic information of the respondents, including gender and academic qualification. Section B contained 4 question items assessing lecturers' perception of Artificial Intelligence (AI). Section consisted of 4 items examining the lecturers' readiness to adopt AI tools for instruction and assessment, while Section D consisted of four question items on challenges faced by lecturers in the integrating of AI in teaching and assessment. Responses were recorded using a 4-point Likert Scale: Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2), and Strongly Disagree (SD = 1).

The questionnaire underwent face and content validation by three experts in Tests and Measurement, Educational Technology and Curriculum Studies from Bayero University, Kano, to ensure accuracy, appropriateness and completeness for the study. The instrument's reliability was confirmed using Cronbach's Alpha, yielding a coefficient of 0.875, indicating high reliability. Data were analysed using frequencies, percentages, mean scores and standard deviations to answer the research questions, while the Pearson Product Moment Correlation coefficient was used to test the research hypothesis at 0.05 level of significance, with aids of the Statistical Package for the Social Sciences (SPSS) software.

Results

Research Question 1: How do lecturers perceive the potential of ethical concerns associated with AI integration in teaching and assessment in Colleges of Education in Kano State?

Table 1: Lecturers' Perception of AI's Ethical Concerns and Potential in Teaching and Assessment in Colleges of Education in Kano State

S/N	Item Statements	SA	A	D	SD	$\bar{x}$	SD	Decision
1.	AI has the potential to improve the efficiency of teaching assessments.	24 (7%)	46 (13%)	135 (38%)	147 (42%)	2.86	0.586	Accepted
2.	AI can enhance the accuracy and fairness of grading.	21 (6%)	55 (16%)	134 (38%)	142 (40%)	3.14	0.605	Accepted
3.	AI will reduce the administrative workload for lecturers.	16 (5%)	42 (12%)	141 (40%)	153 (43%)	3.31	0.726	Accepted
4.	AI can provide personalized feedback for students.	28 (8%)	59 (17%)	130 (37%)	135 (38%)	3.39	0.647	Accepted
	Grand Mean					**3.24**	**0.631**	**Accepted**

The responses indicate a strong belief in the potential of AI ethical framework to enhance teaching and assessment processes. Over 80% of respondents agreed or strongly agreed with statements about AI improving efficiency, accuracy, fairness, and reducing administrative workloads. A significant majority also saw the value of AI in providing personalized feedback to students. The results further shows that all the 4 items had a mean values ranging from 2.86 to 3.48 with a grand mean value of (Mean = 3.24; SD = 0.631), indicating that the mean scores of all the 4 items exceed the acceptable mean of 2.50.This suggests that respondents recognize AI's potential to streamline the assessment process and improve overall educational outcomes.This implies that lecturers positively perceived the potential of AI tools in instruction and assessment in Colleges of Education in Kano State.

Research Question 2: How ready are lecturers to integrate Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State?

Table 2: Lecturers' Readiness to Integrate AI Tools in Teaching and Assessment in Colleges of Education in Kano State

S/N	Item Statements	SA	A	D	SD	$\bar{x}$	SD	Decision
1.	I am ready to continue using Artificial Intelligence tools in my teaching and assessment.	134 (38%)	142 (40%)	21 (6%)	55 (16%)	3.57	0.544	Accepted
2.	I am willing to increase my use of Artificial Intelligence toolsfor teaching and assessment.	135 (38%)	147 (42%)	24 (7%)	46 (13%)	3.62	0.566	Accepted
3.	I am willing to participate in training to improve my Artificial Intelligence toolsuse.	130 (37%)	135 (38%)	59 (17%)	28 (8%)	3.50	0.564	Accepted

4.	I am committed to integratingArtificial Intelligence toolsfor teaching and assessment.	153 (43%)	141 (40%)	16 (5%)	42 (12%)	3.79	0.651	Accepted
	Grand Mean					**3.59**	**0.567**	**Accepted**

The results in Table 4 shows that all the 4 items had a mean values ranging from 3.48 to 3.79 with a grand mean value of 3.59 and standard deviation of 0.567, indicating that the grand mean scores exceed the acceptable mean of 2.50. Therefore, the high mean score of (3.59) clearly show that majority of the lecturers indicates their readiness to adopt and integrate Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State are high, while the moderate standard deviation of (0.567) implies that most lecturers expressed consistent intention and readiness to integrate Artificial Intelligence (AI) tools in their teaching practices, although slight differences exist across individual's responses. By implication the results show that lecturers in Colleges of Education expressed strong intentions and willingness to integrate Artificial Intelligence (AI) tools in their instructional practices. The result further revealed that most of the lecturers are ready and prepared to integrate Artificial Intelligence (AI) tools into teaching and assessment in Colleges of Education in Kano State, Nigeria.

Research Question 3: What are the challenges faced by lecturers in integrating Artificial Intelligence (AI) tools in their teaching practices in Colleges of Education in Kano State?

Table 3: Challenges Faced by Lecturers in Integrating AI Tools in Teaching and Assessment in Colleges of Education in Kano State

S/N	Item Statements	SA	A	D	SD	$\bar{x}$	SD	Decision
1.	Lack of adequate infrastructure (e.g., computers, internet) hinders AI adoption.	14 (4%)	55 (16%)	160 (46%)	123 (35%)	3.71	0.501	Accepted
2.	Lack of training and support for lecturers is a significant barrier.	13 (4%)	49 (14%)	148 (42%)	142 (40%)	3.51	0.539	Accepted
3.	Resistance to change from traditional teaching methods is a challenge.	16 (5%)	41 (12%)	161 (46%)	134 (38%)	3.62	0.514	Accepted
4.	Concerns over data privacy and security affect AI adoption.	18 (5%)	51 (14%)	148 (42%)	135 (38%)	3.45	0.526	Accepted
	Grand Mean					**3.61**	**0.758**	**Accepted**

The analysis highlights several key challenges faced by lecturers in integrating AI into teaching assessment frameworks. The most commonly reported challenges were inadequate infrastructure (82% agreed or strongly agreed), lack of training and support (82% agreed or strongly agreed), and resistance to adopting AI due to traditional teaching methods (84% agreed or strongly agreed). Concerns over data privacy and security were also a notable barrier, with 80% of respondents expressing agreement on the significance of this issue. These findings underscore the need for addressing infrastructural and training deficits to promote AI adoption. The results further shows that all the 4 items on the Table had a mean values ranging from 3.45 to 3.72 with a grand mean value of 3.61 and standard deviation of 0.758, indicating that the mean scores of all the 5 items exceed the acceptable mean of 2.50. The high mean score of (3.61) shows that teachers generally agreed with all the statements presented to them as the challenges facing the integration

of AI tools in teaching and assessment. However, the relatively higher standard deviation (0.758) suggests that their opinions varied, with some lecturers showing stronger enthusiasm while others were less favorable. This implies that majority of the lecturers opined that there are many challenges in the application of AI in instructional processes in Colleges of Education lecturers in Kano State.

Hypothesis 1: There is no significant relationship between lecturers' perception of the benefits of AI and their readiness to adopt AI in teaching and assessmentin Colleges of Education in Kano State**.**

Table 4: Correlation between Lecturers' Perception of AI Benefits and their Readiness to Adopt AI Tools in Colleges of Education in Kano State

Lecturers' Perception of AI Benefits	Lecturers' Readiness to Adopt AI	Pearson Correlation Coefficient (r)	Sig. (*P*)
AI improves teaching efficiency	Ready (Agree/Strongly Agree)	0.81	0.000
AI enhances grading accuracy	Ready (Agree/Strongly Agree)	0.78	0.000
AI reduces administrative workload	Ready (Agree/Strongly Agree)	0.85	0.000
AI provides personalized feedback	Ready (Agree/Strongly Agree)	0.80	0.000

The Pearson correlation analysis reveals a strong positive correlation between lecturers' readiness to adopt AI and their perception of the benefits of AI in teaching and assessment. All correlations are significant at the 0.01 level ($p < 0.001$). Specifically, the strongest correlation is observed between the perception that AI reduces administrative workload and readiness to adopt AI, with a coefficient of 0.85. This suggests that lecturers who perceive AI as beneficial for reducing their workload are more likely to adopt AI tools in their teaching and assessment practices.

Discussion of Findings

The purpose of this study was to examine lecturers' perceptions, readiness and challenges in integrating Artificial Intelligence tools for instruction in Colleges of Education in Kano State, Nigeria. The findings with respect to research question one revealed that lecturers in Colleges of Education in Kano State demonstrate a positive perception of ethical considerations in the adoption of AI tools for teaching and assessment. A significant majority (80%+) of the respondents agreed or strongly agreed that AI ethical framework could improve efficiency, accuracy, fairness, and provide personalized feedback to students. These findings suggest that lecturers generally recognize the value of AI ethical framework in streamlining assessment practices and enhancing educational outcomes. AI's ability to automate grading and provide instant feedback, coupled with its potential for personalized learning, was a particularly well-received aspect. This aligns with previous studies (Ahuja & Bala, 2021) that highlight AI's transformative role in education. Moreover, the finding corresponds with global and national policy positions that emphasize ethical and responsible AI use in education, particularly UNESCO's guidance on generative AI, which underscores the importance of safeguarding learners' rights, ensuring transparencyand preventing misuse in assessment practices (UNESCO, 2023).Similarly, the positive ethical perception observed among lecturers may be attributed to increasing public discourse on AI ethics and the growing exposure of Nigerian academics to discussions on plagiarism, data protection, and misuse of AI-generated content. This is consistent with recent Nigerian studies reporting that lecturers are increasingly cautious about ethical implications even when institutional policies are still emerging (Eleje et al., 2025).

With respect to research question two, the study also found that most lecturers are ready and willing to integrate AI tools into teaching and assessment. This readiness reflects a favourable disposition toward innovation and suggests that lecturers recognize the instructional benefits of AI, such as enhanced lesson preparation, automated assessment support, and improved student engagement. This finding supports the assumptions of the Technology Acceptance Model, which posits that positive perceptions significantly influence users' readiness and intention to adopt new technologies (Davis, 1989).

However, despite this readiness and willingness, the study revealed that lecturers face several challenges in the effective adoption of AI tools. These challenges include inadequate ICT infrastructure, unreliable internet connectivity, limited access to training, insufficient institutional support, and concerns about ethical regulation. Similar challenges have been widely reported in Nigerian tertiary education literature, particularly in Colleges of Education that often experience lower levels of funding and technological support compared to universities (Mahuta, 2024). The challenges identified in the study align with the literature on AI adoption in educational settings. The respondents highlighted several critical barriers, including inadequate infrastructure (such as unreliable internet and outdated computers), lack of sufficient training programmes, and resistance to changing traditional teaching methods. This finding corresponds with earlier research by Balogun et al. (2023), Festus and Emmanuel (2025), which emphasized that insufficient financial and technical assistance are significant barriers to AI implementation in Nigerian higher institutions. The finding also supports the recommendations of Kim et al. (2022) and Owan et al. (2023), who argue that AI adoption requires comprehensive institutional investment in both physical infrastructure and professional development to ensure successful implementation.Despite this recognition, the respondents also indicated challenges in adopting these tools, which is consistent with the findings from other research (Celik et al., 2022) that point to infrastructural and training deficits as key obstacles.

The results of the hypothesis testing confirm several important relationships that affect AI adoption. Hypothesis 1, testing the relationship between lecturers' readiness to adopt AI ethical framework and their perceptions of the benefits of AI framework, showed a strong positive correlation. This suggests that lecturers who perceive AI as beneficial for teaching assessment are more likely to adopt it, emphasizing the importance of demonstrating the practical advantages of AI in educational settings.Importantly, the finding of a significant relationship between lecturers' perception and their readiness to integrate AI tools indicates that perception plays a critical role in shaping adoption behaviour. Lecturers who perceive AI as ethically manageable and pedagogically useful are more likely to be ready and willing to adopt it for instructional purposes. This result reinforces both the Technology Acceptance Model and Diffusion of Innovations theory, which emphasize that positive attitudes and perceived benefits accelerate adoption, while perceived risks and barriers slow it down (Rogers, 2003).

Conclusion

Based on the findings of this study, it can be concluded that lecturers in Colleges of Education in Kano State possess positive ethical perceptions toward the use of AI tools and demonstrate a high level of readiness and willingness to integrate AI into teaching and assessment. This indicates strong human capacity potential for AI-driven instructional innovation within teacher education institutions. However, despite this favourable disposition, lecturers face significant challenges that hinder effective adoption, including infrastructural deficits, limited professional development opportunities, and inadequate institutional policy frameworks. The significant relationship between lecturers' perception and readiness further confirms that positive attitudes alone are insufficient without supportive institutional conditions. Therefore, for AI integration to be effective and sustainable in Colleges of Education in Kano State, there must be deliberate efforts to address the systemic and contextual barriers limiting implementation.

Recommendations

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

i. Colleges of Education should develop and implement clear institutional policies on the ethical use of AI in teaching and assessment, aligned with national and international AI governance frameworks, to guide lecturers and students on acceptable practices.
ii. Regular training, workshops and hands-on professional development programmes should be organized to enhance lecturers' practical skills in using AI tools for instructional delivery and assessment.
iii. Government and Colleges management should invest in reliable internet connectivity, modern computing facilitiesand stable power supply to support effective AI integration.
iv. Colleges of Education should establish functional ICT support units and encourage peer mentoring to assist lecturers in overcoming technical challenges associated with AI tools.
v. AI integration initiatives in Colleges of Education should align with Nigeria's National Artificial Intelligence Strategy and Data Protection Act to ensure responsible, inclusive, and sustainable adoption of AI technologies.
vi. Educational institutions should foster collaboration between AI developers and educators to ensure that AI tools are designed with the needs of lecturers and students in mind. This collaboration can help create more user-friendly, effective, and contextually appropriate AI tools for teaching and assessment.

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