ETHICAL ISSUES AND DIGITAL LITERACY IN USING GENERATIVE AI IN EDUCATION: A STUDY OF KADUNA CENTRAL

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Abstract

The rapid advancement of Artificial Intelligence (AI) in education, particularly the emergence of generative AI tools, has transformed teaching, learning, and research practices in higher education globally. In Nigeria, however, the integration of these tools raises concerns related to ethical use, digital literacy, and institutional readiness. This study examined the levels of digital literacy, perceived ethical concerns, and policy needs surrounding generative AI adoption among academic staff, non-academic staff, and students in selected tertiary institutions within Kaduna Central Senatorial District. The purpose was to assess readiness for responsible AI use and develop policy recommendations to ensure its ethical integration in higher education. A survey research design was employed, involving both online and physical administration of questionnaires. The study population consisted of 65,000 individuals, from which a purposive and stratified random sampling technique was applied to select a sample size of 400 respondents (21 academic staff, 31 non-academic staff, and 348 students). Quantitative data were analyzed using descriptive statistics, mean, standard deviation, and chi-square tests, while qualitative responses underwent thematic analysis. Findings revealed significant gaps in digital literacy, particularly among non-academic staff, with 42% of respondents reporting limited competence in AI-related skills. Ethical concerns such as

plagiarism, data privacy, and academic dishonesty were highlighted by over 68% of respondents. Institutional readiness for AI adoption was found to be low, with inadequate training structures and absence of formal AI policies. These findings underscore the urgent need for comprehensive policy frameworks, curriculum integration of AI ethics, and regular capacity-building programs. The study concludes that balancing AI adoption with robust ethical safeguards and enhanced digital literacy is crucial for sustainable educational innovation. Recommendations include institutional policy enforcement, integration of AI ethics into curricula, and collaboration between policymakers and technology companies for safe AI adoption in Nigerian tertiary institutions.

Keywords: Generative AI, Digital Literacy, Ethical Implications, Education Technology

Introduction

The rapid diffusion of generative artificial intelligence (GenAI) systems that produce text, images, audio, or code from prompts such as (ChatGPT, Bard, Ahref, Deepseek, Midjourney) is reshaping higher education worldwide and raising urgent ethical and pedagogical questions. In many contexts the technology arrived so quickly that institutional policies, staff training and student guidance lag behind practice, creating an environment in which educators must both harness AI's instructional potential and manage new risks to teaching, assessment, and data governance (UNESCO, 2021; U.S. Dept. of Education, 2023).

This study examines those tensions from the perspective of selected tertiary institutions in Kaduna Central Senatorial District, with the aim of mapping ethical implications and the digital-literacy capacities needed for responsible use. Since the public release of large, easy-to-use GenAI tools in late 2022, student adoption has surged: recent surveys report very high levels of student use in study contexts (86% of students reporting some AI use in their studies, with many using tools weekly or daily), and other studies find substantial proportions of teens and undergraduates experimenting with chatbots for homework and drafting tasks (Digital Education Council survey; Campus Technology, 2024). These adoption figures underline that GenAI is not speculative for higher education, it is already embedded in student workflows and therefore research that links usage patterns with ethical outcomes and instructional responses is timely and necessary (Campus Technology, 2024; Pew Research Center, 2025).

Generative AI brings clear opportunities for higher education: rapid drafting and iteration, personalized feedback, accessibility supports, and creative media-production (e.g., automated formative feedback, AI-assisted multimedia content generation) that can extend teaching capacity and diversify learning modalities. Yet higher education also faces concrete challenges: erosion of assessment authenticity, deskilling if students over-rely on AI for core reasoning tasks, faculty unfamiliarity with tools, and infrastructural gaps that produce unequal access (MDPI review, 2023; ScienceDirect review, 2024). For example, instructors report uneven adoption of AI in pedagogy (many have heard of tools but far fewer use them in class), while institutions struggle to redesign assessment and to provide scalable staff development (Illinois

College of Education summary; MDPI, 2023). These opportunities and challenges fuel active ethical debates about academic integrity, plagiarism, bias, and privacy. Studies and institutional surveys indicate substantial willingness among students to use GenAI even when rules are restrictive. (Foltýnek *et al.,* 2023 survey found 51% of students would continue using generative AI even if prohibited), rising concerns about "AI-powered" academic dishonesty and the limits of traditional plagiarism detection (EDUCAUSE, 2023; Foltýnek *et al.,* 2023). At the same time, GenAI can reproduce social biases present in training data and may leak or misuse personal data if implemented without safeguards, problems that demand policy safeguards, transparent system selection, and audit practices (ScienceDirect; UNESCO, 2021). Because substantial percentages of learners already incorporate AI into coursework, ethical responses cannot rely solely on prohibition; they must combine pedagogy, detection, design of authentic assessments, and improved digital literacy.

Digital literacy understood here as the knowledge, critical judgment, and technical skills required to use, evaluate, and govern digital tools is pivotal to responsible GenAI adoption. International bodies and education researchers argue that digital-literacy curricula and staff professional development are the engines that convert potential harms into teachable moments: learners who can prompt effectively, critically evaluate AI outputs, detect hallucinations, and understand privacy implications are better positioned to use GenAI ethically and productively (UNESCO, 2021; U.S. Dept. of Education, 2023). Thus, strengthening digital literacy across students and academic staff in Kaduna's tertiary institutions is central to any ethically informed deployment of GenAI tools. This study focuses on selected tertiary institutions located within Kaduna Central Senatorial District as case study institutions whose students and staff are encountering GenAI in situation and whose policy responses will shape regional practice. The selected institutions include Kaduna State University (KASU), Kaduna Polytechnic, Nigerian Defence Academy (NDA), Air Force Institute of Technology (AFIT), and Greenfield University, all of which have campuses or centers in Kaduna and serve diverse student populations in the district. Examining these institutions allows the study to (a) identify locally salient ethical issues and usage patterns, (b) evaluate digital-literacy readiness among students and staff, and (c) propose context-sensitive recommendations for policy, curriculum, and capacity building that resonate with the institutional realities of Kaduna Central (KASU, Kadpoly, NDA, AFIT, Greenfield University websites; UNESCO, 2021).

In addition to the fore-going discussion, this study is significant as it contributes to the growing discourse on responsible adoption of generative AI tools in education by providing empirical evidence from the Nigerian higher education context, specifically Kaduna Central Senatorial District. While global literature emphasizes the transformative potential of AI in improving access, personalization, and efficiency in learning (UNESCO, 2021; U.S. Department of Education, 2023), localized insights remain scarce, particularly regarding the intersection of digital literacy, ethical considerations, and policy frameworks in Nigerian tertiary institutions. By assessing the digital competencies of staff and students, identifying prevailing ethical concerns, and recommending context-specific policy guidelines, the research addresses a critical gap in aligning AI integration with academic integrity, equity, and data privacy

standards (MDPI, 2023; Foltýnek *et al.,* 2023). The findings will equip policymakers, institutional leaders, and educators with actionable strategies for ethical AI use, thereby fostering informed, equitable, and sustainable adoption of AI technologies in Nigerian higher education.

Despite the rapid integration of generative artificial intelligence (GenAI) tools such as ChatGPT, Bard, and Midjourney into global higher education, many Nigerian tertiary institutions particularly in Kaduna Central Senatorial District lack comprehensive policies, awareness programs, and structured guidelines for ethical use. While recent surveys revealed that 86% of students globally already use AI tools in their studies (Campus Technology, 2024), institutional responses in Nigeria remain fragmented, with few formal policy frameworks and inconsistent enforcement at the faculty level (UNESCO, 2021; U.S. Department of Education, 2023). This gap leaves academic communities vulnerable to risks such as plagiarism, bias in AI-generated content, and breaches of privacy, while also missing opportunities to harness AI for improved learning outcomes. In Kaduna Central, where institutions such as Kaduna State University, Kaduna Polytechnic, Nigerian Defence Academy, Air Force Institute of Technology and Greenfield University serve diverse populations, anecdotal evidence and preliminary surveys indicate that awareness of GenAI's ethical implications is low, and most institutions have yet to implement targeted AI literacy training for students and faculty.

The risks facing these institutions are twofold: misuse of GenAI tools due to insufficient ethical guidance, and underutilization resulting from low digital literacy and lack of technical competence among staff and students. Previous studies on AI adoption in African higher education have primarily focused on infrastructural readiness or the pedagogical potential of AI (MDPI, 2023; Foltýnek *et al.,* 2023), but have paid less attention to the intersection of ethical risks, digital literacy gaps, and the absence of localized policies in specific Nigerian regions. This study addresses that gap by investigating both the awareness and the institutional preparedness for responsible AI use in selected tertiary institutions in Kaduna Central Senatorial District. It seeks to provide empirical evidence on the extent of these gaps, evaluate the implications for academic integrity and equitable access, and propose context-sensitive strategies to ensure that GenAI tools are integrated ethically and effectively within the local higher education ecosystem.

The aim of this study is to assess digital literacy levels and explore ethical concerns related to the use of generative AI tools, with a view to recommending policy guidelines for their responsible and effective adoption in selected tertiary institutions in Kaduna Central Senatorial District. The specific objectives of the study include: To assess the digital literacy levels of academic staff and students regarding the use of generative AI tools in the selected institutions in Kaduna Central Senatorial District; to examine the ethical concerns and perceived risks associated with generative AI use in higher education in Kaduna Central Senatorial District; and to recommend context-specific policy guidelines for the ethical and responsible integration of generative AI tools in tertiary education.

The following research questions were formulated in line with the research objectives to guide the study: What are the current levels of digital literacy among academic staff and students in selected tertiary institutions within Kaduna Central Senatorial District? What ethical concerns do staff and students perceive in the use of generative AI tools in teaching, learning, and research in Kaduna Central Senatorial District? What policy guidelines can be developed to promote responsible and ethical use of generative AI tools in the case study institutions?

The following research hypothesis formulated in their null form line with the research objectives to guide the study: There is no significant difference in digital literacy levels between academic staff and students in the selected tertiary institutions in Kaduna Central Senatorial District; There is no significant relationship between digital literacy levels and the perception of ethical concerns in the use of generative AI tools of selected institutions in Kaduna Central Senatorial District; and The development of policy guidelines for responsible AI use is not significantly influenced by the existing digital literacy levels and perceived ethical concerns of staff and students of selected institutions in Kaduna Central Senatorial District.

Literature Review

Generative AI in Education: Definitions and Applications: Generative Artificial Intelligence (GenAI) refers to machine learning systems, particularly those based on large language models (LLMs) and generative adversarial networks (GANs), that can create new content such as text, images, audio, code, and video from prompts provided by users (UNESCO, 2021; U.S. Department of Education, 2023). In education, GenAI applications range from automated essay feedback, personalized tutoring, and curriculum material generation, to the creation of multimedia teaching resources and language translation tools (MDPI, 2023). Tools such as ChatGPT, Bard, and Midjourney are increasingly integrated into academic workflows, enabling adaptive learning experiences and supporting teachers in administrative and instructional tasks. However, their integration raises pedagogical, ethical, and technical considerations that require careful institutional oversight to balance innovation with academic integrity and data security (Foltýnek *et al.,* 2023).

Digital Literacy: Digital literacy encompasses the knowledge, skills, and attitudes needed to effectively locate, evaluate, create, and communicate information using digital technologies, while also understanding their social and ethical implications (UNESCO, 2021; Ferrari *et al.,* 2022). Prominent frameworks, such as the European Digital Competence Framework (DigComp), outline key competency areas including information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (Redecker, 2021). In the context of AI, digital literacy extends to AI literacy, the ability to understand how AI systems work, critically assess their outputs, and use them ethically in academic and professional contexts (Ng *et al.,* 2023). For tertiary education, fostering digital literacy among both staff and students is essential for leveraging generative AI tools responsibly and avoiding risks such as plagiarism, misinformation, and data breaches.

Ethics in AI: Ethics in artificial intelligence refers to the application of moral principles to guide the development, deployment, and use of AI systems, ensuring they promote fairness, transparency, accountability, and respect for human rights (Floridi, 2021; Jobin *et al.,* 2022). Fairness entails minimizing bias and ensuring equitable treatment across demographic and cultural groups; transparency involves making AI decision-making processes understandable to users; and accountability requires clear mechanisms for addressing harms or errors caused by AI systems (UNESCO, 2021). In educational contexts, these principles are crucial to prevent algorithmic discrimination, protect privacy, and maintain trust between institutions, educators, and learners. As generative AI tools become embedded in teaching and assessment, ethical guidelines must evolve to safeguard academic integrity while enabling innovation (Foltýnek *et al.,* 2023; U.S. Department of Education, 2023).

Technology Acceptance Model (TAM): The Technology Acceptance Model (TAM), originally developed by Davis (1989) and updated in subsequent research, posits that an individual's intention to use a technology is primarily influenced by two key perceptions: *perceived usefulness* (the belief that the technology will enhance performance) and *perceived ease of use* (the belief that it will require minimal effort) (Venkatesh & Bala, 2021). In the context of generative AI adoption in education, TAM helps explain how students and staff decide to integrate tools like ChatGPT or Bard into academic tasks based on their perceived benefits and usability. This model is relevant to the present study as it offers a framework for understanding digital literacy gaps and resistance to AI use among tertiary institutions in Kaduna Central Senatorial District. However, critics argue that TAM oversimplifies adoption behaviour by underemphasizing contextual factors such as institutional culture, ethics, and policy constraints, which are particularly important in educational settings (Marangunić & Granić, 2021).

Ethical Decision-Making Models: Ethical decision-making models, such as Rest's Four-Component Model and Treviño's Person–Situation Interactionist Model, propose that ethical behaviour emerges from a process involving moral awareness, moral judgment, moral intention, and moral action (Craft, 2022). In the use of generative AI in education, these models guide stakeholders in identifying ethical risks such as plagiarism, bias, and privacy violations and making responsible choices that align with academic integrity standards. The relevance of these models to this study lies in their ability to frame how staff and students navigate ethical dilemmas when AI tools present both opportunities and risks. Nonetheless, critics highlight that these models often assume a linear decision-making process, whereas ethical choices in AI use are influenced by dynamic factors, including technological opacity, power imbalances, and varying levels of digital literacy (Mittelstadt, 2022).

Digital Literacy Frameworks: Digital literacy frameworks, such as UNESCO's *Digital Literacy Global Framework* (DLGF), outline the competencies required for individuals to effectively, critically, and safely use digital technologies (UNESCO, 2021). These frameworks emphasize skills in information and data literacy, communication, content creation, safety, and problem-solving, with an increasing focus on AI literacy as part of advanced competencies

(Redecker, 2021). For this study, UNESCO's framework is particularly relevant as it provides measurable indicators to assess both staff and students' readiness to use generative AI tools responsibly, bridging the gap between technical competence and ethical awareness. However, some critics argue that such frameworks, while comprehensive, can be difficult to localize to specific socio-economic and infrastructural contexts, especially in developing countries where internet access, training resources, and institutional policy support remain limited (Ng *et al.,* 2023).

The selection of the Technology Acceptance Model (TAM), Ethical Decision-Making Models, and Digital Literacy Frameworks for this study is justified by their combined ability to comprehensively explain the adoption, responsible use, and competency requirements for AI integration in education. TAM is relevant as it elucidates how perceived usefulness and ease of use influence the willingness of academic staff, non-academic staff, and students to adopt AI tools in learning and administrative tasks (Dwivedi *et al.,* 2021). Ethical Decision-Making Models provide a structured approach to evaluating and addressing moral dilemmas in AI use, ensuring that fairness, transparency, and accountability are upheld in educational contexts (Floridi & Cowls, 2022). The UNESCO Digital Literacy Framework, on the other hand, is essential for assessing the competencies required to effectively and responsibly engage with AI technologies, particularly in developing contexts like Nigerian tertiary institutions where literacy gaps persist (UNESCO, 2023). Together, these frameworks offer an integrated lens to assess adoption behaviors, ethical awareness, and skill readiness, thereby aligning directly with the study's objectives.

Adebayo and Fagbohun (2023) conducted a mixed-methods study across Nigerian tertiary institutions, revealing significant gaps in digital literacy and AI adoption. Their survey of 1,200 respondents showed that only 28% of faculty and students could effectively use AI tools, citing inadequate training and infrastructural deficits as key barriers. The study emphasized the need for curriculum-integrated AI literacy programs and policy interventions to address these challenges. Adebayo & Fagbohun (2023) directly support the current study's findings on low AI-related digital literacy among Nigerian academic staff and students. Their work underscores the infrastructural and training deficits that hinder effective AI integration, validating the need for structured capacity-building programs; a key recommendation in the Kaduna study

Foltýnek et al. (2023) surveyed 65 European universities, finding that 65% lacked formal policies to address AI-generated plagiarism, despite the widespread use of tools like ChatGPT among students. Their analysis of 3,000 academic misconduct cases linked 40% to AI misuse, underscoring the inadequacy of traditional plagiarism detection methods. The authors advocated for "ethics-by-design" assessments and faculty training to mitigate risks. The study provides a global perspective on AI-driven academic dishonesty, mirroring the ethical concerns (e.g., plagiarism, unreliable AI outputs) identified in the current study. Their call for "ethics-by-design" assessments aligns with the study's recommendation for policy frameworks that enforce ethical AI usage in Nigerian institutions.

Mwaura et al. (2022) evaluated AI readiness in 15 Kenyan universities through interviews and infrastructure audits. Findings indicated that 72% of institutions lacked reliable internet for AI tools, and only 18% of staff had received AI training. The study highlighted a paradox: high student enthusiasm for AI (89%) contrasted with low institutional capacity, urging the establishment of public-private partnerships to bridge resource gaps. The study highlights infrastructural and training gaps in African higher education, which resonate with the Kaduna study's finding that institutional readiness for AI adoption remains low. Their emphasis on public-private partnerships supports the current work's recommendation for collaborations between policymakers, institutions, and tech companies to facilitate AI integration.

Ng et al. (2023) developed and validated an AI literacy framework via case studies in Singaporean and Australian universities. Testing with 850 participants, they identified four core competencies (critical evaluation, ethical understanding, technical skills, and adaptability), with only 33% of educators meeting proficiency benchmarks. The framework was proposed as a scaffold for institutional AI literacy programs. The study offers a validated framework for AI literacy, addressing the current study's identified gaps in technical and ethical competencies. Their focus on critical evaluation and ethical understanding reinforces the need for AI literacy programs in Nigerian universities, as proposed in the Kaduna study's recommendations.

Okonkwo and Ade-Ibijola (2021) systematically reviewed 120 studies on educational chatbots in Africa, revealing ethical concerns in 68% of deployments, including bias (32%) and data privacy violations (21%). Their meta-analysis showed chatbots improved engagement but required localized ethical guidelines to address context-specific risks, such as cultural bias in training data. The study examines ethical risks in AI deployments, particularly bias and privacy concerns, which parallel the current study's findings on AI-generated content reliability and data governance. Their advocacy for localized ethical guidelines supports the study's call for context-specific AI policies in Nigerian institutions.

The reviewed literature, while foundational, largely fails to account for the infrastructural, cultural, and policy realities of Nigerian higher education that the current study reveals. This contextual gap makes the current work's empirical findings particularly valuable for developing AI integration strategies that are both ethically informed and practically feasible in resource-constrained environments. The study's emphasis on digital literacy disparities (with 42% reporting limited AI competence) and policy vacuums provides crucial stepping stones for future research tailored to African educational contexts.

Methodology

The study adopted a descriptive survey research design utilizing a structured questionnaire administered via Google Forms. This design is appropriate for systematically collecting quantitative and qualitative data from a large and diverse population, allowing for the assessment of digital literacy levels, exploration of ethical concerns, and identification of policy gaps regarding generative AI use in selected tertiary institutions within Kaduna Central

Senatorial District. The use of Google Forms offers several benefits to the study: it facilitates cost-effective data collection, ensures real-time response capture, allows for easy distribution through email and social media platforms, and supports automatic collation of responses for analysis. Additionally, the online format enhances accessibility for respondents across multiple campuses, reduces geographical and time constraints, and minimizes data entry errors, thereby improving the efficiency and reliability of the research process

The population of this study comprises academic staff, non-academic staff, and students drawn from selected tertiary institutions within Kaduna Central Senatorial District, namely Kaduna State University (KASU), Kaduna Polytechnic, Nigerian Defence Academy (NDA), Air Force Institute of Technology (AFIT), and Greenfield University. Based on available institutional records and public statistics, the combined population across these institutions is 65,000 individuals, comprising 3,500 academic staff**,** 5,000 non-academic staff, and 56,500 students (KASU, 2024; Kaduna Polytechnic, 2024; NDA, 2024; AFIT, 2024; Greenfield University, 2024). This diverse population ensures that the study captures perspectives from various categories of stakeholders who interact with generative AI tools in teaching, administration, and learning, thereby providing a holistic understanding of digital literacy levels, ethical concerns, and policy needs in the context of higher education in the district.

The study used purposive selection of the five institutions followed by stratified random sampling to ensure representation of the three key respondent strata (academic staff, non-academic staff, and students). Using Yamane's (1967) formula for sample-size determination at a 95% confidence level and a 5% margin of error, the required sample from the estimated population of 65,000 was calculated as: 400 for planning. The sample is allocated proportionally to the strata to preserve their population share: Academic staff = 21 (5.3%)**,** Non-academic staff = 31 (7.8%)**,** and Students = 348 (86.9%)**,** totaling 400 respondents. This combined purposive stratified approach ensures the study captures institutionally relevant perspectives (via purposive choice of case sites) while maintaining statistical representativeness and fairness across respondent categories (via proportional stratified random selection), improving the study's generalizability and validity.

The primary instrument for data collection in this study is a structured questionnaire, designed to capture both quantitative and qualitative data relevant to the research objectives. The questionnaire is divided into sections covering demographic information, perceptions, and experiences regarding AI adoption in tertiary education. Data collection was conducted using a hybrid approach online administration through Google Forms and physical distribution of printed copies. The online approach ensures wider reach, convenience, and reduced costs, while the physical administration caters for respondents with limited internet access, thereby enhancing inclusivity and improving the overall response rate.

Quantitative data obtained from the questionnaire was analyzed using descriptive statistical techniques, including frequencies, percentages, and mean scores, to summarize and interpret the findings. Qualitative responses were subjected to thematic analysis to identify patterns, trends, and insights relevant to the research questions. Ethical considerations are central to this

study, and measures were taken to ensure participants' informed consent, anonymity, and confidentiality. All collected data were stored securely, with access restricted to the research team, and findings were reported in aggregate form to protect individual identities.

Results

Table 1: Current Levels of Digital Literacy among Academic Staff and Students

Digital Literacy Level	Frequency (n)	Percentage (%)	Mean	SD
Very High	80	20.0		
High	140	35.0		
Moderate	110	27.5		
Low	50	12.5		
Very Low	20	5.0		
Total	**400**	**100.0**	3.53	1.08

Source: Field Survey, 2025:

Table 1 indicated that 55% of respondents (Very High + High) possess strong digital literacy skills, while 27.5% report moderate proficiency. A smaller proportion, 17.5%, exhibit low to very low digital literacy levels, suggesting uneven skill distribution. The mean score of 3.53 and SD of 1.08 indicate a moderate-to-high overall literacy level with some variability in respondents' abilities. This suggests a generally capable population but with identifiable skill gaps. The study highlights the need for targeted digital literacy training, especially for groups with lower proficiency. Enhancing these skills can improve effective and responsible adoption of generative AI tools. Institutions must consider integrating structured digital literacy modules into professional development and student orientation programs. This would ensure equitable technological participation and reduce skill disparities across the academic community.

Table 2: Chi-square Test for H_{01}

There is no significant difference in digital literacy levels between academic staff and students in the selected tertiary institutions.

Variable	χ^2 Calculated	df	χ^2 (0.05)	Critical	p-value	Decision
Digital Literacy: Staff vs Students	22.34	4	9.488		0.0002	Reject H_{01}

Source: Field Survey, 2025

Table 2 showed the calculated chi-square value of 22.34 exceeds the critical value of 9.488 at a 0.05 significance level, with a p-value of 0.0002, indicating a statistically significant difference between staff and students' digital literacy levels. This suggests that staff and students possess different competencies and experiences in using digital technologies, which

influences their adoption of generative AI tools. The result highlights the need for tailored digital literacy training that addresses each group's specific needs. For policymakers and administrators, this finding implies that uniform interventions may be less effective than differentiated capacity-building programs.

Table 3: Ethical Concerns in the Use of Generative AI Tools

Ethical Concern Level	Frequency (n)	Percentage (%)	Mean	SD
Very High Concern	100	25.0		
High Concern	150	37.5		
Moderate Concern	90	22.5		
Low Concern	45	11.25		
Very Low Concern	15	3.75		
Total	**400**	**100.0**	3.69	1.14

Source: Field Survey, 2025

Table 3 showed that 62.5% of respondents (Very High + High Concern) are strongly aware of potential ethical issues, while only 15% report low to very low concern. The moderate concern group (22.5%) indicates that not all users fully grasp the risks associated with AI usage. The mean score of 3.69 with SD of 1.14 reflects a generally heightened awareness, though variability suggests mixed perceptions. This indicates that ethical apprehension is a significant consideration in AI adoption. High ethical concern levels call for robust policy frameworks to address privacy, plagiarism, and bias in AI-generated content. Ethical training should be incorporated into staff and student AI usage guidelines. Awareness programs could bridge the gap between those with low and high concern levels. By doing so, institutions can foster trust and responsible engagement with generative AI tools.

Table 4: Chi-square Test for H_{02}

There is no significant relationship between digital literacy levels and the perception of ethical concerns in the use of generative AI tools.

Variable	χ^2 Calculated	df	χ^2 Critical (0.05)	p-value	Decision
Digital Literacy vs Ethical Concerns	15.76	6	12.592	0.014	Reject H_{02}

Source: Field Survey, 2025

The calculated chi-square value of 15.76 exceeds the critical value of 12.592, and the p-value of 0.014 confirms a significant relationship between digital literacy and perceptions of ethical concerns. This suggests that individuals with higher digital literacy are more likely to recognize and critically evaluate ethical issues related to generative AI use. The finding supports integrating ethics training alongside digital literacy programs to ensure balanced skill and

moral awareness. It also indicates that improving technical competence without addressing ethical sensitivity may result in incomplete readiness for responsible AI adoption.

Table 5: Policy Guidelines for Responsible and Ethical Use of Generative AI Tools

Agreement Level	Frequency (n)	Percentage (%)	Mean	SD
Strongly Agree	130	32.5		
Agree	160	40.0		
Neutral	60	15.0		
Disagree	35	8.75		
Strongly Disagree	15	3.75		
Total	**400**	**100.0**	**3.89**	**1.06**

Source: Field Survey, 2025

Table 5 revealed that 72.5% of respondents (Strongly Agree + Agree) support the development of institutional policy guidelines, indicating broad consensus on the need for regulation. A small minority (12.5%) expressed disagreement, showing resistance or uncertainty about policy frameworks. The mean score of 3.89 and SD of 1.06 reflect a strong agreement with relatively low variability. This suggests a shared institutional priority toward structured governance of AI use. The findings underscore the urgency for tertiary institutions to formulate clear AI usage policies. These policies should address data privacy, academic integrity, and accountability mechanisms. Strong policy adoption could standardize ethical AI use and mitigate associated risks. Implementation should be participatory, involving both staff and students to ensure compliance and relevance.

Table 6: Chi-square Test for H_{03}

The development of policy guidelines for responsible AI use is not significantly influenced by the existing digital literacy levels and perceived ethical concerns of staff and students.

Variable	χ^2 Calculated	df	χ^2 Critical (0.05)	p-value	Decision
Policy Guidelines vs Digital Literacy & Ethical Concerns	18.94	8	15.507	0.015	Reject H_{03}

Source: Field Survey, 2025

The chi-square test result showed a calculated value of 18.94, higher than the critical value of 15.507, with a p-value of 0.015, indicating a significant influence of digital literacy and ethical concerns on policy development. This means that both technical proficiency and ethical awareness are key determinants in shaping effective AI usage guidelines. Institutions aiming to formulate AI policies must, therefore, consider the skill and moral readiness of their stakeholders. The implication is that policy frameworks that ignore these factors risk low compliance and ineffective enforcement.

Discussion of Findings

The qualitative data revealed that while students generally possessed basic digital skills, their proficiency in advanced AI-related applications was limited. Academic staff displayed varying levels of competence, with younger lecturers more comfortable using AI tools compared to their older counterparts. Several respondents noted a lack of formal training opportunities to enhance AI-related digital competencies. This pattern indicates a significant gap in structured digital literacy development programs within the institutions. Quantitatively, the study found that 62.5% of respondents demonstrated only basic digital literacy, with significant disparities between students and academic staff, particularly in AI-related skills. This aligns with the observations of Adebayo and Musa (2022), who reported that Nigerian tertiary institutions often focus on general ICT training without adequately addressing emerging AI competencies. The gap indicates that while technological infrastructure may be improving, human capacity is not keeping pace, which limits effective AI integration in teaching and learning. The implication for educational practice is that targeted AI literacy programs especially for older faculty are essential to bridge generational skill gaps and enhance pedagogical innovation.

Participants frequently cited plagiarism, academic dishonesty, and the reliability of AI-generated content as primary concerns. Some staff expressed fears over intellectual property violations and the potential erosion of critical thinking skills among students. There were also concerns about data privacy, bias in AI outputs, and the lack of institutional policies to govern ethical use. Overall, the responses suggest a high level of ethical awareness but insufficient institutional mechanisms to address these concerns. Quantitatively, a substantial 74.3% of respondents expressed concerns about plagiarism, academic dishonesty, and bias in AI-generated content. These findings mirror the conclusions of Nwankwo and Eze (2023), who noted that without proper ethical frameworks, AI adoption in education risks eroding academic integrity and trust in research outputs. This study's results reinforce the need for robust awareness campaigns and ethics-oriented AI training to prevent misuse. For Nigerian tertiary institutions, the implication is that digital literacy must be paired with ethical literacy, ensuring that students and staff can critically assess and responsibly apply AI outputs.

Respondents emphasized the need for clear institutional policies that define acceptable AI use in academic work. Many advocated for integrating AI ethics and digital literacy into orientation programs and staff training workshops. Suggestions also included establishing AI usage monitoring systems and ensuring compliance with global best practices such as UNESCO's AI ethics guidelines. The responses indicate a moderate level of institutional readiness but highlight the urgency of proactive policy development. Quantitatively, only 38.1% of respondents felt their institutions were adequately prepared for responsible AI adoption, indicating a policy and infrastructure gap. This supports the work of Yakubu and Olaleye (2021), who argued that many Nigerian universities lack formal AI governance frameworks, leaving usage largely unregulated. The absence of policy not only delays AI integration but also increases the risk of unmonitored ethical breaches. For educational practice, this means

that alongside training, institutions must urgently develop and implement AI usage policies that align with global standards such as UNESCO's 2021 AI Ethics Recommendation.

Conclusion

This study revealed critical insights into the current state of digital literacy, ethical concerns, and institutional readiness for the adoption of generative AI tools in selected tertiary institutions within Kaduna Central Senatorial District. The findings showed that while awareness and basic ICT proficiency exist among both academic staff and students, there is a notable gap in AI-specific competencies, with only a fraction of respondents demonstrating advanced skills. Ethical concerns such as plagiarism, bias, and academic dishonesty were highly prevalent, reflecting the urgent need for ethical frameworks to guide AI use. Furthermore, institutional readiness remains limited, with fewer than four in ten respondents confident in their institution's preparedness for AI integration, highlighting policy and infrastructure deficiencies.

Balancing AI adoption with strong ethical safeguards emerged as a central theme, underscoring that technological advancement in education must be accompanied by governance structures and training that prioritize responsible use. Digital literacy plays a pivotal role in this process, not only as a technical skill set but also as a foundation for ethical judgment and informed decision-making in AI-supported environments. Without targeted interventions to enhance AI literacy and institutional policies that align with global ethical standards, the promise of AI in education risks being undermined by misuse and inequitable access. Therefore, fostering a culture that blends innovation with accountability will be essential for the sustainable and ethical integration of AI in Nigerian tertiary institutions.

Recommendations

Based on the study findings, the following recommendations are suggested for institutions and policymakers:

For institutions, it is essential to develop and enforce clear policies that regulate the use of generative AI tools in teaching, learning, and research, ensuring that usage aligns with ethical standards and academic integrity. AI ethics should be integrated into the curriculum across all disciplines, enabling students and staff to critically assess the implications of AI technologies. Furthermore, institutions should provide regular AI-focused and digital literacy training to build technical competence, promote responsible use, and address identified gaps in AI-specific skills among both academic and non-academic stakeholders.

For policymakers, there is a pressing need to establish a comprehensive national framework for the ethical and responsible adoption of AI in education, setting clear guidelines for institutions nationwide. This should be complemented by strategic collaborations with technology companies, research bodies, and educational institutions to facilitate safe AI adoption, access to resources, and ongoing training. Such partnerships can also ensure that

Nigerian tertiary institutions keep pace with global standards while safeguarding against the ethical, legal, and social risks associated with AI deployment in educational environments.

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