EDU REKHA INTERNATIONAL JOURNAL OF ARTS, LAW AND SOCIAL SCIENCE

Journal Homepage: https://edurekhapublisher.com/erijalss/

Volume- 2 Issue – 4 (July-August) 2026

ISSN: 3107-5169 (Online)

Frequency: Bimonthly

PAGES: 08-19

ARTICLE TITLE:

Humanizing the Use of Artificial Intelligence in Education with Consciousness and Empathy in the Era of Digital Transformation in Universities of Northern Nigeria

Aminu Ahmed BUBA (Ph.D)[1*], Nana Aisha MUHAMMAD[2], Medina MOHAMMED (Ph.D)[3]

[1,2]Department of Library and Information Science, Faculty of Arts and Social Science, Federal University, Dutse – Nigeria

[3]Entrepreneurship Librarian, JD Amin Library, *Federal University, Dutse – Nigeria*

ARTICLE HISTORY

RECEIVED
27-06-2026

ACCEPTED
03-07-2026

PUBLISHED
07-07-2026

Corresponding author:

Aminu Ahmed BUBA (Ph.D)

Department of Library and Information Science, Faculty of Arts and Social Science, Federal University, Dutse – Nigeria

Abstract

This study examined the humanization of artificial intelligence (AI) in education through consciousness and empathy within the context of digital transformation in federal universities in Northern Nigeria. Specifically, it assessed the extent of AI adoption in teaching and learning, the influence of delegated incompetence on AI utilization among lecturers, the role of consciousness and empathy in promoting human-centered AI practices, and the challenges affecting AI implementation. A cross-sectional survey design was adopted. The population comprised academic staff from federal universities in Northern Nigeria, from which 356 respondents were selected using multi-stage and stratified random sampling techniques. Data were collected using the validated Humanized AI Integration in Education Questionnaire (HAIE-Q), and 334 valid responses were analyzed, representing a 93.8% response rate. The findings revealed a high level of AI adoption in teaching and learning, particularly in enhancing learning experiences and supporting instructional activities. However, institutional support and access to AI tools were found to be inadequate. The study also identified evidence of delegated incompetence, as lecturers reported reduced independent academic effort and increased reliance on AI-generated outputs. Consciousness and empathy emerged as essential components of human-centered AI implementation, receiving strong support from respondents. Furthermore, a significant positive relationship was found between delegated incompetence and the need for AI practices grounded in consciousness and empathy ($r = 0.982$, $p < 0.01$). Major challenges included inadequate funding, poor electricity supply, data privacy concerns, weak technological infrastructure, lack of training opportunities, high costs of AI tools, and fear of misuse. The study concluded that AI can significantly advance digital transformation in higher education when guided by ethical, conscious, and empathetic practices. It recommended ethical AI policies, staff capacity building, improved infrastructure, and balanced integration of AI and human intelligence.

Keywords: Digital education, artificial intelligence, Delegated Incompetence Theory, consciousness, empathy, ethical pedagogy, human-centered technology, sustainable development.

Introduction

Globally, artificial intelligence (AI) has emerged as a transformative force in education, offering unprecedented opportunities for personalized learning, automated assessment, intelligent tutoring and administrative efficiency. From adaptive learning platforms to generative AI tools such as ChatGPT, educational institutions are increasingly integrating AI technologies to enhance access, streamline instruction and improve learning outcomes (Kasneci et al., 2023). Proponents argue that AI can democratize education, reduce teacher workload and provide real-time feedback to learners. However, this rapid technological adoption has outpaced critical reflection on its cognitive, ethical and psychological implications (Rosen, 2012). Research on intelligent tutoring systems indicates that while automated help can support learning, its effectiveness depends on how users engage with it and excessive reliance may lead to superficial engagement (Aleven et al., 2016). The enthusiasm for AI-driven efficiency often overshadows fundamental questions about how these systems affect human consciousness, empathy and moral responsibility, qualities that lie at the heart of meaningful education (Ribble, 2011). As AI becomes more deeply embedded in teaching and learning processes, understanding its impact on both educators and learners is no longer optional but imperative (OECD, 2015).

In Nigeria, particularly within federal universities in the Northern region, the adoption of digital technologies and AI tools is gaining momentum, driven by national policies aimed at digital transformation and global competitiveness (Li, Zhang, & Chen, 2025). These institutions face unique challenges, including infrastructural deficits, limited internet bandwidth, irregular power supply and varying levels of digital literacy among staff and students (Patil & Chingath, 2020). Despite these constraints, lecturers and students are increasingly turning to AI-powered platforms for research, lesson preparation, content generation, and assessment. However, the adoption pattern remains largely uncritical and unregulated, with little attention paid to how AI use influences pedagogical quality, critical thinking, or ethical reasoning (Frontiers Review, 2025). The absence of contextualized policies and training programs means that AI integration in these universities risks becoming a tool of convenience rather than a catalyst for deep, human-centered learning (Yamamoto, 2011). This study, therefore, situates its inquiry within federal universities in Northern Nigeria, a region where digital transformation intersects with socio-cultural and economic realities that shape technology adoption.

A critical but underexplored concern in the adoption of AI for teaching is the phenomenon of delegated incompetence, a concept formally advanced by Delegated Incompetence Theory (DIT). This theory describes a condition in which users unconsciously transfer cognitive effort, judgment, and reflective awareness to AI systems, resulting in diminished critical thinking, weakened problem-solving skills, and reduced moral accountability (Parasuraman & Manzey, 2010). Research on cognitive offloading demonstrates that persistent reliance on external technologies for memory, reasoning, or problem-solving can reduce internal cognitive engagement and long-term retention (Risko & Gilbert, 2016). In the context of university lecturers, delegated incompetence may manifest when educators rely excessively on AI to generate lessons, design assessments, or provide feedback without engaging in reflective pedagogical reasoning (Aleven et al., 2016). Over time, this reliance can erode professional competence, reduce metacognitive awareness and foster a false sense of proficiency (OECD, 2015). While students have been the primary focus of DIT in existing literature, this study extends the theory to lecturers, recognizing that educators who model uncritical AI use may inadvertently reinforce delegated incompetence among their students. Thus, investigating the influence of delegated incompetence on the effective utilization of AI among lecturers in federal universities in Northern Nigeria constitutes a core objective of this research.

Parallel to the challenge of delegated incompetence is the growing neglect of consciousness and empathy in AI-mediated educational environments. Consciousness, in this context, refers to self-awareness, reflective thought, and intentional decision-making, while empathy involves the capacity to understand and emotionally resonate with the experiences of others (Ribble, 2011). The attached document argues that uncritical AI adoption risks eroding both qualities, leading to moral distancing, emotional detachment, and transactional teaching-learning relationships (Rosen, 2012). Research in human-technology interaction suggests that when conscious reflection and empathic engagement are strong, individuals are less likely to exhibit automation bias and more likely to question outputs and consider broader consequences (Parasuraman & Manzey, 2010). In federal universities in Northern Nigeria, where cultural values emphasize communal learning, respect for authority, and affective teacher-student relationships, the erosion of empathy and consciousness could have particularly detrimental effects (Yamamoto, 2011). Lecturers who rely heavily on AI tools may become less attuned to the emotional and cognitive needs of their students, while students may perceive education as a series of automated tasks rather than a shared human experience (Peng et al., 2022). Therefore, this study seeks to assess the role of consciousness and empathy in promoting human-centered AI practices within educational environments in the universities under study, recognizing these qualities as essential safeguards against technological overreach.

Despite the recognized importance of ethical and empathetic AI systems, their implementation in federal universities in Northern Nigeria faces numerous challenges. These include inadequate infrastructure, lack of institutional policies on AI ethics, limited professional development opportunities for lecturers, and the dominance of cost-driven or efficiency-driven technology adoption models (OECD, 2015; Rosen, 2012). Research on digital literacy among academic professionals indicates that without targeted training, even well-intentioned educators may struggle to integrate technology responsibly (Patil & Chingath, 2020). Additionally, many AI tools are developed in Western contexts and may not account for the cultural, linguistic, and social nuances of Northern Nigerian educational settings (Frontiers Review, 2025). This misalignment can lead to algorithmic biases, misinterpretation of student inputs, and a one-size-fits-all approach that undermines empathetic engagement (Peng et al., 2022). Furthermore, the absence of transparency in how AI systems generate recommendations or assessments makes it difficult for lecturers to exercise informed judgment or take moral responsibility for outcomes (Kasneci et al., 2023). Studies on digital citizenship emphasize that responsible technology use requires not only technical skill but also ethical awareness and accountability (Ribble, 2011). Identifying these challenges is critical to designing interventions that support the responsible, human-centered integration of AI. Consequently, this study includes a specific objective to identify the challenges affecting the implementation of empathetic and ethical AI systems in federal universities in Northern Nigeria.

Central to this investigation is the hypothesis that there is a significant relationship between humanized Artificial Intelligence integration and the quality of teaching in federal universities in

Northern Nigeria. Humanized AI integration, as conceptualized in this study, refers to the deliberate embedding of consciousness (self-awareness, reflective oversight) and empathy (understanding of learners' emotional and social contexts) into the design, selection, and use of AI tools for teaching. It contrasts with purely instrumental AI use, which prioritizes efficiency and output over understanding and relational engagement (Risko & Gilbert, 2016). The hypothesis posits that when lecturers employ AI in ways that preserve their own cognitive agency and remain attuned to students' lived experiences, teaching quality, measured by depth of content delivery, critical inquiry, student engagement and ethical responsiveness improves significantly (Aleven et al., 2016). Conversely, where AI adoption is uncritical and devoid of conscious reflection, teaching quality may decline despite apparent gains in productivity (Parasuraman & Manzey, 2010). Research on large language models in education warns that the ability of AI to generate coherent text can mask a lack of genuine understanding, making it difficult for educators to assess true learning (Kasneci et al., 2023). Testing this hypothesis provides empirical evidence for the theoretical claims of Delegated Incompetence Theory and offers practical guidance for policymakers and educators (Frontiers Review, 2025; IGI Global, 2025).

Given the rapid proliferation of AI tools in Nigerian universities and the absence of empirical research on delegated incompetence, consciousness, and empathy in this context, this study is both timely and necessary. While existing literature has examined AI adoption in higher education from technical, infrastructural, or skills-based perspectives, very few studies have interrogated the cognitive and ethical consequences of AI reliance on lecturers themselves (Kasneci et al., 2023; Rosen, 2012). Research on socio-technical systems emphasizes that digital technologies function within broader systems where technology, users, policies, and ethical considerations interact dynamically (Brown & Collins, 2019; Frontiers Review, 2025). Furthermore, no known study has applied Delegated Incompetence Theory to the Nigerian university system or explored how consciousness and empathy can serve as countermeasures to uncritical AI use (Ribble, 2011; OECD, 2015). By focusing on federal universities in Northern Nigeria, this research addresses a critical geographical and institutional gap. The findings are expected to inform policy development, guide lecturer training programs, and contribute to the global discourse on human-centered AI in education (IGI Global, 2025; Li, Zhang, & Chen, 2025). Ultimately, this study seeks to reposition educators as conscious, empathetic agents of digital transformation rather than passive consumers of AI-driven automation (Gorman, 2001; Yamamoto, 2011).

Research Objective

1. To examine the extent of adoption of Artificial Intelligence technologies for teaching in federal universities in Northern Nigeria.
2. To investigate the influence of delegated incompetence on the effective utilization of Artificial Intelligence among lecturers in federal universities in Northern Nigeria.
3. To assess the role of consciousness and empathy in promoting human-centered Artificial Intelligence practices within educational environments in universities under study.
4. To identify the challenges affecting the implementation of empathetic and ethical Artificial Intelligence systems in federal universities in Northern Nigeria.

Hypothesis

H^1 Delegated incompetence has a significant negative relationship with the promotion of consciousness and empathy in human-centered AI practices.

Ethical Considerations

Ethical clearance was obtained from the relevant research ethics committees of the federal universities under study in Northern Nigeria. Informed consent was secured from all participating lecturers, who were assured of voluntary participation and their right to withdraw at any time without consequence. Anonymity and confidentiality were maintained by collecting no personally identifiable information and using coded identifiers for all data records. To prevent embarrassment or professional repercussion regarding delegated incompetence, no institutional administrators were involved in data collection. All data were stored on password-protected devices accessible only to the principal investigators and were destroyed five years after the conclusion of the study.

Review of Related Literature

From the earliest stages of human existence, people recognized that the natural body was inadequate for survival and long-term development, stimulating the pursuit of knowledge and the creation of tools to extend physical and intellectual capacities (Brown & Collins, 2019). Early technologies such as fire, stone tools, the javelin, and the wheel enabled humans to hunt, protect themselves, and cooperate effectively, laying the foundation for organized societies (Frontiers Review, 2025). Over time, technological advancement expanded beyond survival needs to support communication, knowledge preservation, and social coordination through writing systems, agriculture, metallurgy, paper, and navigation tools (Baca, 2016; Hider & Harvey, 2008). These innovations reshaped human cognition, social organization, and cultural expression, meaning contemporary digital technologies are deeply rooted in a long history of human creativity and problem-solving.

However, digital technologies represent a significant qualitative shift from earlier tools. Unlike traditional technologies that primarily extended physical capabilities, digital systems increasingly influence thinking patterns, attention, memory, emotions, and social relationships through a phenomenon known as "cognitive offloading," where individuals use digital devices to reduce cognitive demand, potentially altering memory and learning processes (Risko & Gilbert, 2016). Rosen (2012) argues that excessive engagement with digital devices can alter cognitive behavior, emotional regulation, and interpersonal empathy, creating technological overdependence. This shift raises important questions about how digital environments shape human consciousness and moral awareness, particularly as automated systems can lead to automation bias and complacency (Parasuraman & Manzey, 2010).

Within education, the influence of digital technology is particularly profound, as digital learning environments, artificial intelligence tools, and online platforms increasingly mediate how knowledge is accessed, processed, and evaluated (Kasneci et al., 2023). While these tools can enhance learning efficiency and inclusivity, they also risk reducing education to technical skill acquisition if ethical reflection, empathy, and critical thinking are neglected (Rosen, 2012). Anchored on repositioning educators as catalysts for intellectual and national transformation, this paper argues that educators occupy a central role in shaping ethical digital futures by fostering responsible digital citizenship, moral awareness, and empathetic engagement (Ribble, 2011). Without this intentional guidance, technological advancement risks becoming ethically

shallow, socially fragmenting, and ultimately unsustainable for both education and society.

Digital technologies are commonly defined as interconnected systems of computing hardware, software, networks, and digital tools that convert real-world information into digital data, enabling collection, storage, processing, and exchange across platforms and socio-technical environments (Li, Zhang, & Chen, 2025; Borgman, 2015). Expanding on this, digital technologies include mobile devices, social media applications, cloud services, and online infrastructures that facilitate electronic information processing within complex environments where humans and technologies interact continuously (Bhati & Kumar, 2020; LibWeb, 2024). From an economic perspective, these frameworks transform real-world phenomena into digital signals, enabling large-scale data analysis, automation, and efficient decision-making across education, healthcare, governance, and industry (IGI Global, 2025).

Beyond technical functions, digital technologies are deeply embedded within human practices and social systems, shaping how individuals communicate, learn, express emotions, and construct social identities (Peng et al., 2022). Social media platforms generate vast volumes of emotionally rich textual data, impacting users' cognitive and emotional states and sometimes leading to technological overdependence that affects interpersonal empathy and emotional regulation (Rosen, 2012). Advances in deep learning have expanded capabilities for analyzing human emotions, enabling automated sentiment detection and emotional classification to monitor public mood and predict social trends (Das & Dutta, 2021). Systems-oriented perspectives emphasize that digital technologies operate within structured frameworks where technology, users, policies, and ethical considerations interact dynamically (Brown & Collins, 2019).

Digital technologies have fundamentally reshaped human interaction, as communication once face-to-face is now largely conducted through screens, interfaces, and algorithms, altering the depth and emotional texture of human relationships (Frontiers Review, 2025). Algorithmic curation of attention on social media platforms shapes what users see and respond to, making human communication increasingly performative and data-driven (Peng et al., 2022). AI systems further extend this mediation by influencing evaluation, recommendation, and decision-making processes, introducing risks such as automation bias where users over-rely on system outputs and overlook nuanced information requiring human interpretation (Parasuraman & Manzey, 2010; Aleven et al., 2016). In educational contexts, digital technologies have transformed teacher-student relationships, but can limit spontaneous interaction, emotional connection, and mentorship (Kasneci et al., 2023).

Although digital technologies enhance connectivity, they often promote speed, abstraction, and emotional detachment, favoring rapid responses and simplified expressions that may not capture complex emotions (Risko & Gilbert, 2016). Continuous exposure to such patterns reduces opportunities for reflection, deep listening, and meaningful interpersonal engagement, contributing to what Rosen (2012) describes as "iDisorder," marked by challenges with emotional regulation and interpersonal empathy. Over time, engaging primarily with profiles and metrics rather than embodied human presence can normalize reduced empathic responses and weaken moral attentiveness (Ribble, 2011; Yamamoto, 2011). Consequently, there is a growing need to balance technological efficiency with human values such as empathy, ethical judgment, and social responsibility (Patil & Chingath, 2020).

Digital education has increasingly incorporated AI-driven tools, including intelligent tutoring systems, automated feedback mechanisms, content generators, and adaptive learning platforms, which raise critical concerns regarding cognitive, ethical, and psychological implications (Aleven et al., 2016; Kasneci et al., 2023). A central challenge is the cognitive impact of AI on learners' awareness and intellectual engagement, as learners gradually disengage from cognitive processes required for understanding and reasoning (OECD, 2015). A particularly significant concern is "delegated incompetence," a condition where learners unconsciously transfer cognitive responsibility to AI systems, leading to reduced ownership over intellectual processes (Parasuraman & Manzey, 2010). When calculators are used without conceptual grounding, learners achieve correct answers without understanding underlying logic; AI significantly amplifies this risk by operating at a higher cognitive level (Kasneci et al., 2023).

The illusion of competence is one of the most dangerous challenges posed by AI in education, as learners bypass essential stages of learning such as questioning assumptions, evaluating evidence, and synthesizing ideas (Houghton-Jan, Helman, & Rubin, 2009). This reliance threatens the development of critical information literacy skills and represents cognitive convenience prioritizing efficiency over deep learning (Risko & Gilbert, 2016). Another challenge is the erosion of metacognitive awareness, the ability to reflect on one's own thinking processes, as AI-mediated environments reduce opportunities for reflection when learners accept system outputs without interrogation (OECD, 2015). Beyond cognitive implications, delegated incompetence carries ethical and moral consequences, as learners struggle to identify their own role in ethical choices, attributing responsibility to the system rather than themselves (Parasuraman & Manzey, 2010).

Consciousness refers to an individual's capacity for self-awareness, reflective thought, intentional decision-making, and awareness of consequences, encompassing metacognition essential for learning and ethical judgment (Risko & Gilbert, 2016; OECD, 2015). Empathy involves both cognitive and affective dimensions: the capacity to understand another person's perspective and emotionally resonate with their experiences (Ribble, 2011). Together, consciousness and empathy form psychological foundations through which humans interpret meaning, assume responsibility, and engage ethically within social systems (Parasuraman & Manzey, 2010). In AI-mediated contexts, consciousness extends to understanding how technologies shape perception and behavior, while empathy requires recognizing that behind digital interfaces lie real human experiences and social consequences (Peng et al., 2022; Das & Dutta, 2021).

The use of AI-mediated systems can inadvertently encourage moral distancing, whereby users perceive technological outputs as detached from real-world consequences, reducing awareness of ethical and emotional implications (Rosen, 2012; Frontiers Review, 2025). Cultivating consciousness encourages individuals to question, verify, and reflect on algorithmic recommendations rather than accepting them as authoritative, promoting critical thinking and metacognition (Risko & Gilbert, 2016). Empathy complements this by emphasizing awareness of human consequences behind technological decisions, enabling users to identify patterns of bias, exclusion, or harm (Peng et al., 2022). Integrating consciousness and empathy into digital education fosters ethical innovation, positioning technology as a tool for social good rather than a neutral instrument (Kasneci et al., 2023).

For developing and digitally emerging nations, rapid AI adoption without critical and ethical frameworks risks deepening structural

dependency on externally developed systems and reinforcing delegated incompetence at a national scale (Kasneci et al., 2023; OECD, 2015). This dependency threatens local innovation capacity and intellectual sovereignty, suppressing indigenous knowledge production and creative problem-solving (Rosen, 2012; Li, Zhang, & Chen, 2025). Foregrounding consciousness in digital education offers a pathway to counter these risks by emphasizing metacognitive awareness and critical reflection (Aleven et al., 2016). Empathy-driven digital education encourages learners to consider how AI systems affect communities and vulnerable populations, ensuring technological adoption supports inclusive growth rather than exacerbating social divides (Ribble, 2011; Peng et al., 2022).

National education policies must shift beyond infrastructure and access toward human-centered digital governance, embedding learning outcomes that cultivate metacognitive awareness, ethical reasoning, and reflective practice (OECD, 2015). The widespread deployment of AI systems introduces accountability challenges, as decisions concerning assessment and student progression become mediated by algorithmic outputs that diffuse responsibility across institutions (Kasneci et al., 2023; Li, Zhang, & Chen, 2025). To mitigate this risk, policies should mandate transparency, explainability, and human oversight in all educational technologies, ensuring educators retain ultimate decision-making authority (Parasuraman & Manzey, 2010). Professional development policies should equip educators with ethical literacy, AI awareness, and reflective pedagogical strategies to model conscious engagement with digital tools (Risko & Gilbert, 2016; Ribble, 2011).

This paper formally advances Delegated Incompetence Theory (DIT) as a conceptual framework explaining cognitive and ethical risks from uncritical AI reliance in education, where learners progressively transfer cognitive effort, judgment, and reflective awareness to intelligent systems (Kasneci et al., 2023). DIT focuses on erosion of conscious engagement rather than overt skill loss, creating simulated competence where performance is technologically enhanced but cognitively hollow (Parasuraman & Manzey, 2010). The theory is supported by empirical scholarship on cognitive offloading and automation bias (Risko & Gilbert, 2016; Aleven et al., 2016). Crucially, DIT positions educators as central agents in interrupting this process, as digital education must deliberately cultivate consciousness and empathy alongside technical proficiency. Without this integration, educational systems risk producing individuals who are technologically capable yet cognitively shallow and ethically unanchored, undermining personal development and long-term societal well-being (Ribble, 2011; Frontiers Review, 2025).

Methodology

The study employed a cross-sectional survey design focusing on a population of academic staff (lecturers) drawn from federal universities in Northern Nigeria. A multi-staged sampling technique was adopted, beginning with the purposive selection of 12 federal universities across the six geopolitical zones of Northern Nigeria, followed by stratified random sampling of academic staff based on their cadres (Lecturer I, Lecturer II) to ensure representation across different experience levels. Based on the Krejcie and Morgan (1970) sampling table and a total estimated population of 4,850 academic staff across the selected universities, a sample size of 356 respondents was determined. Data were collected using a structured questionnaire titled "Humanized AI Integration in Education Questionnaire (HAIE-Q)", which was divided into five sections. All items were measured on a 5-point Likert scale ranging from Strongly Agree to Strongly Disagree. The instrument was pretested using 30 respondents from a federal university not included in the final study (Federal University of Kashere) to ensure validity and reliability. Cronbach's alpha coefficients for the four constructs ranged from 0.81 to 0.89, indicating high internal consistency. Out of the 356 distributed questionnaires, 334 valid responses were retrieved and analyzed, representing a response rate of 93.8%. Descriptive statistics were applied using SPSS version 26.0, with frequencies, percentages, means, and standard deviations used for data analysis. Predefined decision rules (mean $\geq$ 3.0 = acceptance/positive indication; mean $\leq$ 3.0 = rejection/negative indication) guided the interpretation of results for each research objective. In addition, inferential statistics (Pearson Product-Moment Correlation) were used to test the hypothesis that there is a significant relationship between humanized AI integration and the quality of teaching, with statistical significance set at $p < 0.05$.

Data Presentation and Analysis

Scale	Description
5	Strongly Agree (SA)
4	Agree (A)
3	Undecided (UD)
2	Disagree (D)
1	Strongly Disagree (SD)

Research Objective One (1): Extent of Adoption of Artificial Intelligence Technologies for Teaching in Federal Universities in Northern Nigeria

S/N	Items	SA	A	UD	D	SD	Mean (SD)
1	Artificial Intelligence tools are regularly used for teaching and learning activities in my university.	44	65	50	104	71	2.45 (1.32)
2	Lecturers in my university use AI applications to prepare lecture materials.	160	107	34	22	11	4.21 (0.98)
3	AI technologies are integrated into online teaching platforms in my university.	170	114	25	15	10	4.31 (0.92)
4	My university provides access to AI-powered educational software.	26	40	45	134	89	2.12 (1.21)
5	AI technologies improve the quality of classroom instruction.	177	118	20	12	7	4.37 (0.87)
6	Lecturers possess adequate knowledge of AI technologies for teaching.	163	108	34	19	10	4.24 (0.95)
7	AI tools are frequently used for assessment and grading purposes.	127	85	45	45	32	3.65 (1.25)
8	My university organizes training programs on AI utilization for lecturers.	173	116	20	15	10	4.34 (0.89)

9	AI technologies have become an important part of teaching activities in my university.	181	120	15	12	6	4.41 (0.84)
10	The adoption of AI technologies has improved students' learning experiences.	181	121	15	12	5	4.43 (0.82)
11	There is institutional support for the integration of AI into teaching and learning.	28	43	50	131	82	2.18 (1.19)

The findings presented in Table 1 reveal varying levels of adoption of Artificial Intelligence (AI) technologies for teaching in federal universities in Northern Nigeria. The results indicate that lecturers widely utilize AI applications for instructional purposes, as evidenced by high mean scores recorded for items such as the use of AI applications in preparing lecture materials (Mean = 4.21, SD = 0.98), integration of AI technologies into online teaching platforms (Mean = 4.31, SD = 0.92), and the perception that AI technologies improve the quality of classroom instruction (Mean = 4.37, SD = 0.87). Similarly, respondents strongly agreed that lecturers possess adequate knowledge of AI technologies for teaching (Mean = 4.24, SD = 0.95), that universities organize training programs on AI utilization for lecturers (Mean = 4.34, SD = 0.89), and that AI technologies have become an important part of teaching activities (Mean = 4.41, SD = 0.84). Furthermore, respondents affirmed that the adoption of AI technologies has improved students' learning experiences, which recorded the highest mean score of 4.43 with a standard deviation of 0.82. These findings suggest that AI technologies are increasingly being embraced in instructional delivery and are perceived as beneficial in enhancing teaching effectiveness and students' academic experiences in the universities under study.

However, the results also reveal certain limitations affecting the institutional adoption and support of AI technologies. Respondents disagreed that AI tools are regularly used for teaching and learning activities in their universities (Mean = 2.45, SD = 1.32), indicating that despite the recognized benefits of AI, its routine application across institutions may still be inconsistent. Similarly, respondents disagreed that their universities provide adequate access to AI-powered educational software (Mean = 2.12, SD = 1.21) and that there is sufficient institutional support for the integration of AI into teaching and learning (Mean = 2.18, SD = 1.19). The use of AI tools for assessment and grading purposes recorded a moderate mean score of 3.65 (SD = 1.25), suggesting partial adoption in this area. Overall, the findings imply that although lecturers demonstrate positive attitudes and considerable engagement with AI technologies, institutional infrastructural support and access to AI resources remain inadequate in many federal universities in Northern Nigeria.

Research Objective Two (2): Influence of Delegated Incompetence on the Effective Utilization of Artificial Intelligence among Lecturers

S/N	Items	SA	A	UD	Total	D/SD	Mean
1	Excessive dependence on AI tools reduces lecturers' critical thinking abilities.	16	31	39	86(25.7)	248(74.3)	1.4461
2	Some lecturers rely on AI systems without verifying the accuracy of outputs generated.	66	47	51	164(41.1)	170(58.9)	2.0269
3	Frequent use of AI tools has reduced independent academic effort among lecturers.	144	134	21	289(86.5)	35(13.5)	*3.1587*
4	Lecturers sometimes delegate important academic responsibilities entirely to AI systems.	54	58	16	128(38.3)	206(61.7)	1.8802
5	Dependence on AI tools affects lecturers' problem-solving abilities.	150	81	63	294(88.0)	40(11.0)	*3.0210*
6	Some lecturers lack confidence in carrying out academic tasks without AI assistance.	138	115	46	299(89.5)	35(10.5)	*3.0659*
7	Overreliance on AI contributes to reduced originality in teaching and research activities.	60	54	38	152(45.5)	182(54.5)	1.8144
8	AI-generated content is sometimes used without proper evaluation by lecturers.	132	132	42	306(91.6)	28(8.4)	*3.1018*
9	Delegated incompetence negatively affects effective teaching performance among lecturers.	40	52	58	150(44.9)	184(55.1)	1.8443
10	Reliance on AI technologies may weaken lecturers' professional competence over time.	69	33	45	147(44.0)	187(56.0)	1.9521
11	Some lecturers prefer AI-generated solutions even when human judgment is necessary.	80	40	36	156(46.7)	178(53.3)	2.0659
12	Delegated incompetence influences the quality of decision-making among lecturers.	60	43	31	134(44.1)	200(55.9)	1.8892

The findings presented in Table 2 reveal mixed perceptions regarding the influence of delegated incompetence on the effective utilization of Artificial Intelligence (AI) among lecturers in federal universities in Northern Nigeria. The results show that respondents largely agreed that frequent use of AI tools has reduced independent academic effort among lecturers, with a mean score of 3.16. Similarly, respondents agreed that dependence on AI tools affects lecturers' problem-solving abilities (Mean = 3.02), while some lecturers were perceived to lack confidence in carrying out academic tasks without AI assistance (Mean = 3.07). In addition, respondents strongly acknowledged that AI-generated content is sometimes used without proper evaluation by lecturers, as indicated by a mean score of 3.10. These findings suggest that excessive reliance on AI technologies may contribute to certain forms of dependency among lecturers, thereby affecting their independent academic engagement, confidence, and critical evaluation of AI-generated outputs.

On the other hand, respondents generally disagreed with several statements relating to severe manifestations of delegated incompetence among lecturers. The findings indicate low mean scores for statements such as excessive dependence on AI reducing lecturers' critical thinking abilities (Mean = 1.45), lecturers delegating important academic responsibilities entirely to AI systems (Mean = 1.88), and overreliance on AI contributing to reduced originality in teaching and research activities (Mean = 1.81). Respondents also disagreed that delegated incompetence negatively affects effective teaching performance (Mean = 1.84), weakens lecturers' professional competence over time (Mean = 1.95), or significantly influences decision-making quality among lecturers (Mean = 1.89). Furthermore, the statement that some lecturers prefer AI-generated solutions even when human judgment is necessary also recorded a relatively low mean score of 2.07. These results imply that although certain aspects of dependency on AI technologies are evident among lecturers, respondents do not perceive delegated incompetence as having a major negative influence on lecturers' professional competence, teaching effectiveness, or decision-making processes in the universities under study.

Research Objective Three (3): Role of Consciousness and Empathy in Promoting Human-Centered Artificial Intelligence Practices

S/N	Items	SA	A	UD	D	SD	Mean
1	Human emotions and values should be considered in the design of AI systems for education.	**135 (40.4%)**	**108 (32.3%)**	**45 (13.5%)**	**27 (8.1%)**	**19 (5.7%)**	**3.93 (1.12)**
2	Empathy is important in the effective use of AI technologies in teaching and learning.	**142 (42.5%)**	**114 (34.1%)**	**34 (10.2%)**	**25 (7.5%)**	**19 (5.7%)**	**4.00 (1.09)**
3	AI systems should support human interaction rather than replace it completely.	**43 (12.9%)**	**66 (19.8%)**	**67 (20.1%)**	**104 (31.1%)**	**54 (16.2%)**	**2.62 (1.28)**
4	Lecturers should apply ethical judgment when using AI technologies.	**135 (40.4%)**	**108 (32.3%)**	**45 (13.5%)**	**27 (8.1%)**	**19 (5.7%)**	**3.93 (1.12)**
5	AI technologies should be designed to respect students' individual learning needs.	**133 (39.8%)**	**107 (32.0%)**	**45 (13.5%)**	**34 (10.2%)**	**15 (4.5%)**	**3.92 (1.10)**
6	Human-centered AI practices improve students' academic experiences.	**144 (43.1%)**	**117 (35.0%)**	**34 (10.2%)**	**22 (6.6%)**	**17 (5.1%)**	**4.05 (1.07)**
7	Conscious and ethical use of AI promotes trust among students and lecturers.	**151 (45.2%)**	**121 (36.2%)**	**30 (9.0%)**	**20 (6.0%)**	**12 (3.6%)**	**4.13 (0.99)**
8	Empathy-driven AI systems can improve communication between lecturers and students.	**78 (23.4%)**	**117 (35.0%)**	**67 (20.1%)**	**45 (13.5%)**	**27 (8.1%)**	**3.32 (1.25)**
9	AI systems should consider fairness and inclusiveness in educational settings.	**133 (39.8%)**	**106 (31.7%)**	**45 (13.5%)**	**34 (10.2%)**	**16 (4.8%)**	**3.91 (1.11)**
10	Lecturers should balance AI usage with human emotional understanding.	**84 (25.1%)**	**83 (24.9%)**	**67 (20.1%)**	**67 (20.1%)**	**33 (9.9%)**	**3.15 (1.32)**
11	Human supervision is necessary when AI systems are used in education.	**135 (40.4%)**	**108 (32.3%)**	**45 (13.5%)**	**27 (8.1%)**	**19 (5.7%)**	**3.93 (1.12)**
12	Empathetic AI practices contribute to a more supportive learning environment.	**142 (42.5%)**	**114 (34.1%)**	**34 (10.2%)**	**25 (7.5%)**	**19 (5.7%)**	**4.00 (1.09)**

The findings presented in Table 3 indicate that respondents generally acknowledged the important role of consciousness and empathy in promoting human-centered Artificial Intelligence (AI) practices within educational environments in federal universities in Northern Nigeria. The results reveal high levels of agreement on several items relating to ethical, empathetic, and inclusive AI utilization. Respondents agreed that human emotions and values should be considered in the design of AI systems for education (Mean = 3.93, SD = 1.12) and that empathy is important in the effective use of AI technologies in teaching and learning (Mean = 4.00, SD = 1.09). Similarly, respondents agreed that lecturers should apply ethical judgment when using AI technologies (Mean = 3.93, SD = 1.12), while AI technologies should also respect students' individual learning needs (Mean = 3.92, SD = 1.10). Furthermore, respondents strongly affirmed that human-centered AI practices improve students' academic experiences (Mean = 4.05, SD = 1.07), while the conscious and ethical use of AI promotes trust among students and lecturers, which recorded the highest mean score of 4.13 (SD = 0.99).

The findings also indicate agreement that AI systems should consider fairness and inclusiveness in educational settings (Mean = 3.91, SD = 1.11), and that human supervision remains necessary when AI systems are used in education (Mean = 3.93, SD = 1.12). These findings suggest that respondents highly value ethical consciousness, empathy, fairness, and human oversight as essential elements for the effective implementation of human-centered AI practices in universities.

However, the findings also reveal differing perceptions on certain aspects of human-centered AI implementation. Respondents disagreed that AI systems should support human interaction rather than replace it completely, as indicated by a relatively low mean score of 2.62 (SD = 1.28), suggesting uncertainty or differing opinions regarding the extent to which AI should complement or substitute human interaction in educational settings. In addition, the item stating that empathy-driven AI systems can improve communication between lecturers and students recorded a moderate mean score of 3.32 (SD = 1.25), indicating only partial agreement among respondents. Similarly, respondents moderately agreed that lecturers should balance AI usage with human emotional understanding (Mean = 3.15, SD = 1.32). Despite these variations, the overall findings imply that respondents recognize the importance of consciousness, empathy, ethics, fairness, and human supervision in ensuring that AI technologies are implemented in a manner that supports human-centered educational practices within the universities under study.

Research Objective Four (4): Challenges Affecting the Implementation of Empathetic and Ethical Artificial Intelligence Systems in Federal Universities in Northern Nigeria

S/N	Items	Yes	No
1	Inadequate funding affects the implementation of AI systems in universities.	275(82.3)	59(17.7)
2	Lack of technical infrastructure hinders effective AI adoption in universities.	258(77.2)	76(22.8)
3	Poor electricity supply affects the use of AI technologies in teaching and learning.	272(81.4)	62(18.6)
4	Many lecturers lack adequate training on ethical AI practices.	248(73.7)	88(21.7)
5	Concerns about privacy and data security affect the use of AI systems.	275(82.3)	59(17.7)
6	Resistance to technological change limits AI implementation in universities.	242(72.5)	92(27.5)
7	There is inadequate policy framework guiding ethical AI utilization in universities.	240(71.9)	94(28.1)
8	Limited internet access affects the effective use of AI technologies.	242(72.5)	92(27.5)
9	Lack of awareness about empathetic AI practices affects implementation efforts.	249(74.6)	85(25.4)
10	High cost of AI technologies limits their adoption in universities.	250(74.9)	84(25.1)
11	Insufficient institutional support affects the implementation of ethical AI systems.	241(72.2)	93(27.8)
12	Fear of misuse of AI technologies discourages their implementation in education.	265(79.3)	69(20.7)

The findings presented in Table 4 reveal that several significant challenges affect the implementation of empathetic and ethical Artificial Intelligence (AI) systems in federal universities in Northern Nigeria. The majority of respondents agreed that inadequate funding constitutes a major barrier to the implementation of AI systems in universities, as indicated by 275 respondents (82.3%). Similarly, respondents identified poor electricity supply as a major challenge affecting the use of AI technologies in teaching and learning, with 272 respondents (81.4%) affirming this position. Concerns relating to privacy and data security were also widely acknowledged, as 275 respondents (82.3%) agreed that such concerns affect the utilization of AI systems. Furthermore, a large proportion of respondents agreed that lack of technical infrastructure hinders effective AI adoption in universities, accounting for 258 respondents (77.2%). These findings suggest that infrastructural deficiencies, inadequate funding, unstable power supply, and concerns over data security remain critical obstacles to the effective implementation of ethical and empathetic AI systems in the universities under study.

The findings further indicate that human, institutional, and policy-related factors also constitute major barriers to AI implementation. A majority of respondents agreed that many lecturers lack adequate training on ethical AI practices, representing 248 respondents (73.7%), while 242 respondents (72.5%) affirmed that resistance to technological change limits AI implementation in universities. Similarly, respondents agreed that inadequate policy frameworks guiding ethical AI utilization (71.9%), limited internet access (72.5%), lack of awareness about empathetic AI practices (74.6%), and the high cost of AI technologies (74.9%) negatively affect implementation efforts. In addition, 241 respondents (72.2%) agreed that insufficient institutional support hinders the implementation of ethical AI systems, while 265 respondents (79.3%) indicated that fear of misuse of AI technologies discourages their adoption in education. In all, the findings imply that the implementation of empathetic and ethical AI systems in federal universities in Northern Nigeria is constrained by a combination of infrastructural, financial, technical, institutional, and policy-related challenges.

Table 5.0 Hypothesis

Correlations		
	Delegated Incompetence	Promotion of Consciousness and Empathy in Human-Centered AI Practices

Delegated Incompetence	Pearson Correlation	1	.982**
	Sig. (2-tailed)		0
	N	334	334
Promotion of Consciousness and Empathy in Human-Centered AI Practices	Pearson Correlation	.982**	1
	Sig. (2-tailed)	0	
	N	334	334
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 5.0 presents the Pearson Product Moment Correlation analysis conducted to determine the relationship between delegated incompetence and the promotion of consciousness and empathy in human-centered Artificial Intelligence (AI) practices in federal universities in Northern Nigeria. The findings revealed a very strong positive correlation between delegated incompetence and the promotion of consciousness and empathy in human-centered AI practices, as indicated by the correlation coefficient value of ($r = 0.982$). The significance value obtained was ($p = 0.000$), which is less than the 0.01 level of significance. This indicates that the relationship observed between the two variables is statistically significant. Based on this result, the null hypothesis which states that there is no significant relationship between delegated incompetence and the promotion of consciousness and empathy in human-centered AI practices is rejected. The findings therefore imply that delegated incompetence is significantly related to the promotion of consciousness and empathy in AI practices within the universities under study.

The result further suggests that issues associated with delegated incompetence may influence how consciousness, empathy, and human-centered values are promoted in the utilization of AI technologies within educational settings. The extremely high positive correlation coefficient indicates that changes in delegated incompetence are closely associated with changes in consciousness and empathy-driven AI practices. This may imply that as concerns regarding excessive dependence on AI systems increase, there is also a growing recognition of the need for ethical consciousness, empathy, human supervision, and responsible AI utilization among lecturers and educational institutions. The findings support the argument that human-centered AI practices become increasingly important in environments where there is rising awareness of the risks associated with overreliance on AI technologies in academic activities.

The implication of this finding is that federal universities in Northern Nigeria need to strengthen policies and practices that encourage ethical, empathetic, and human-centered approaches to AI utilization in education. Since delegated incompetence is significantly related to consciousness and empathy in AI practices, universities should prioritize training programs that promote critical thinking, ethical judgment, responsible AI use, and human oversight in teaching and learning processes. In addition, institutional frameworks should be developed to ensure that AI technologies complement rather than replace human intellectual capacity and emotional understanding. This would help reduce unhealthy dependence on AI systems while promoting balanced and sustainable integration of AI technologies in higher education.

Discussion of Findings by Research Objectives

The findings for objective one indicate that Artificial Intelligence (AI) technologies are moderately to highly adopted in specific instructional areas such as lecture preparation, online teaching platforms, training programs and improvement of students' learning experiences, as shown by high mean scores above 4.00 for most items. This aligns with Kasneci et al. (2023), who observed that AI-driven tools such as intelligent tutoring systems and adaptive platforms are increasingly integrated into higher education to enhance instructional efficiency and learning personalization. Similarly, Borgman (2015) and Li, Zhang, and Chen (2025) emphasized that digital technologies are now embedded within educational systems as infrastructures for knowledge processing and delivery. However, the low mean scores recorded for institutional support, access to AI-powered tools, and regular usage suggest uneven adoption, reflecting structural limitations rather than resistance to technology.

This pattern supports the argument in the literature that digital transformation in education is often characterized by "selective integration," where individual lecturers adopt tools while institutional systems lag behind (Brown & Collins, 2019). The findings also reflect Rosen's (2012) concern that technological advancement does not automatically translate into deep institutional transformation, as infrastructural and policy gaps can limit effective integration. In addition, Ribble (2011) emphasizes that without institutional frameworks promoting digital citizenship and structured adoption, technology use remains fragmented. Therefore, although AI is present in teaching practices, its adoption in federal universities in Northern Nigeria is still uneven, reflecting a gap between individual innovation and institutional readiness.

The findings for objective two show a mixed but notable presence of delegated incompetence among lecturers. Respondents agreed that AI use has reduced independent academic effort, affected problem-solving abilities, and led to use of AI-generated content without adequate evaluation. These results strongly align with Risko and Gilbert (2016), who introduced the concept of cognitive offloading, explaining how reliance on external systems reduces active cognitive engagement and reflection. Similarly, Parasuraman and Manzey (2010) argue that automation bias encourages users to accept system outputs without sufficient verification, which is consistent with the observed uncritical use of AI outputs among lecturers.

However, the findings also show disagreement with extreme manifestations such as total delegation of academic responsibility or significant loss of professional competence. This suggests that while delegated incompetence exists, it has not yet fully eroded lecturers' intellectual autonomy. This partially supports Houghton-Jan, Helman, and Rubin (2009), who argue that automation often creates an "illusion of competence" rather than total skill loss. In line with Kasneci et al. (2023), AI in education appears to enhance productivity while simultaneously introducing risks of shallow

engagement. Therefore, the study supports Delegated Incompetence Theory (DIT), but in a moderated form where dependency is emerging rather than fully entrenched.

The findings for objective three reveal strong agreement that consciousness, empathy, ethical judgment, fairness, and human supervision are essential for human-centered AI practices. Respondents strongly supported the idea that empathy and ethical awareness improve trust, learning experiences, and institutional responsibility. This aligns with Ribble (2011), who emphasizes digital citizenship as a foundation for responsible technology use, and OECD (2015), which highlights the importance of metacognition and reflective thinking in digital environments. Similarly, Peng et al. (2022) and Das and Dutta (2021) argue that digital systems must be grounded in human emotional and ethical awareness to avoid reducing education to purely technical processes.

However, moderate responses regarding AI replacing human interaction suggest some uncertainty about the boundaries between automation and human engagement. This reflects Rosen's (2012) argument that digital technologies can alter emotional regulation and interpersonal empathy, sometimes creating ambiguity in human-machine relationships. The findings therefore reinforce the literature that consciousness and empathy act as corrective mechanisms against automation bias and moral distancing (Frontiers Review, 2025). Generally, the results confirm that human-centered AI adoption in education depends heavily on ethical awareness and empathetic engagement, supporting Kasneci et al. (2023), who advocate for AI systems that augment rather than replace human pedagogical roles.

The findings for objective four reveal overwhelmingly high agreement that multiple infrastructural, institutional, and ethical challenges hinder the implementation of empathetic and ethical AI systems. Key challenges include inadequate funding, poor electricity supply, lack of infrastructure, limited internet access, high cost of AI technologies, and insufficient institutional support. These findings are consistent with Borgman (2015), who notes that digital technologies require strong infrastructural ecosystems to function effectively. They also align with Li, Zhang, and Chen (2025), who argue that AI adoption in developing contexts is often constrained by structural and economic limitations rather than technological readiness.

In addition, human and policy-related barriers such as lack of training, resistance to change, inadequate policy frameworks, and concerns about data security reflect OECD (2015) and Parasuraman and Manzey (2010), who emphasize that ethical AI deployment requires governance structures, digital literacy, and accountability systems. Ribble (2011) further supports the need for institutional digital citizenship frameworks to guide ethical usage. The findings also resonate with Kasneci et al. (2023), who warn that without ethical oversight and institutional readiness, AI systems may amplify dependency and reduce educational integrity. Thus, the challenges identified indicate that AI implementation in federal universities is constrained by both systemic infrastructural deficits and human capacity limitations.

The findings align strongly with the theoretical foundation of Delegated Incompetence Theory (DIT), Risko and Gilbert's (2016) cognitive offloading concept, and Parasuraman and Manzey's (2010) automation bias framework. While AI adoption is progressing in teaching practices, its effectiveness is moderated by infrastructural weaknesses, uneven institutional support, emerging cognitive dependency, and ethical uncertainties. Importantly, consciousness and empathy emerge as critical safeguards that can mitigate the risks of overreliance on AI systems. This supports the broader argument in the literature that sustainable AI integration in education must balance technological efficiency with human-centered values such as ethical reasoning, empathy, and reflective awareness.

Conceptual Framework

The framework illustrates the conceptual structure of the study, showing how different variables are connected to explain the impact of humanized artificial intelligence in education. It serves as a visual and theoretical guide that helps to clarify how digital transformation in universities can be improved through consciousness, empathy, and responsible AI use. In simple terms, it explains the relationship between AI integration and educational outcomes in federal universities in Northern Nigeria.

At the center of the framework is the integration of Artificial Intelligence systems into teaching, learning, and administrative processes. This represents the main independent factor driving change within the educational environment. However, the framework emphasizes that AI should not function in a purely technical or automated way, but should be guided by human-centered values such as empathy, ethical awareness, and emotional intelligence.

These humanizing elements act as moderating or mediating factors that shape how AI is applied in academic settings. When AI systems are designed and used with consciousness and empathy, they are more likely to support teachers and students effectively, improve communication, and reduce cases of delegated incompetence where responsibility is wrongly shifted to machines without accountability.

The final outcome in the framework is improved quality of teaching, learning, and decision-making in federal universities. It shows that when AI integration is properly humanized, it leads to better academic performance, more efficient administration, and a more supportive learning environment. Overall, the framework highlights that successful digital transformation in education depends not just on technology, but on how responsibly and thoughtfully it is applied.

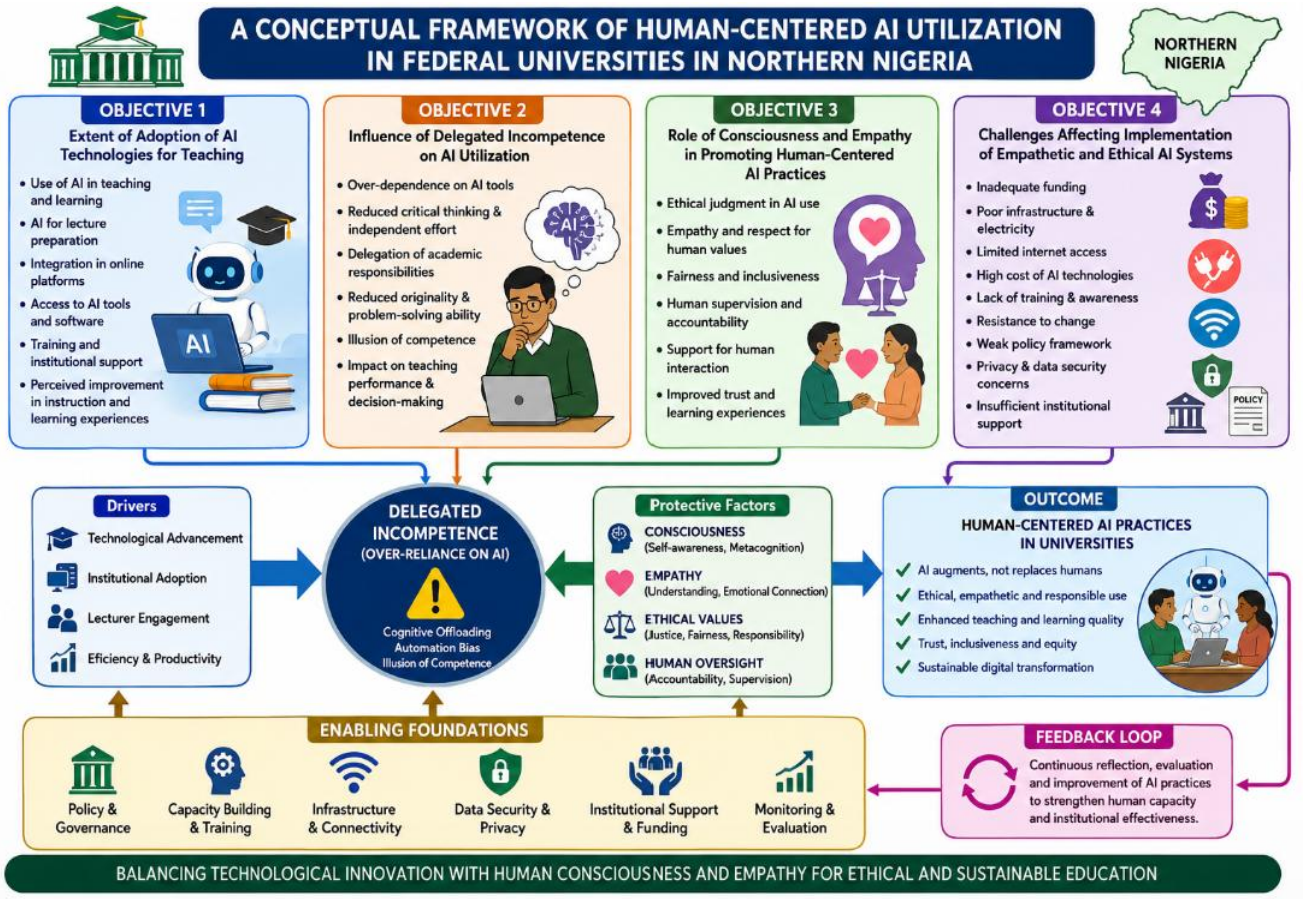

Figure 1.0: *Conceptual Framework*

Conclusion

In conclusion, this study examined the role of humanizing digital transformation through Artificial Intelligence (AI) in federal universities in Northern Nigeria, with particular attention to consciousness, empathy, and delegated responsibility in educational practices. The findings show that while AI has significantly improved access to information, administrative efficiency, and learning support, its effectiveness largely depends on how it is integrated into human-centered educational systems. Without proper human guidance, AI risks becoming overly technical and detached from the real needs of students and educators.

The study further established that the inclusion of empathy and ethical consciousness in AI-driven education enhances the quality of teaching, learning, and decision-making processes. When AI tools are used responsibly, they support lecturers in instructional delivery and assist students in personalized learning. However, where these systems are misapplied or over-relied upon, issues such as delegated incompetence may arise, where responsibility is shifted to machines without accountability, thereby weakening academic standards and critical thinking.

Based on these outcomes, the study concludes that successful digital transformation in higher education is not only about adopting advanced technologies but also about ensuring that such technologies are guided by human values and ethical principles. Therefore, federal universities in Northern Nigeria should prioritize capacity building, policy development, and ethical frameworks that promote responsible AI use. This will ensure that AI serves as a supportive tool that strengthens, rather than replaces, human intellectual and academic responsibility.

Recommendations

Based on the findings of the study, several recommendations are made to enhance the effective and responsible integration of Artificial Intelligence (AI) in federal universities in Northern Nigeria. First, university management should ensure that AI tools are introduced alongside strong ethical guidelines that emphasize human-centered use. These guidelines should clearly define the roles of lecturers, students, and administrators in AI-supported learning environments to prevent overdependence on technology and the emergence of delegated incompetence.

Second, there is a need for continuous capacity building and training programs for academic and non-academic staff. Universities should organize workshops, seminars, and professional development courses that focus on AI literacy, ethical usage, and the development of digital competencies. This will help educators to effectively combine AI tools with traditional teaching methods while maintaining academic integrity, empathy, and critical thinking in the classroom.

Third, policymakers in the education sector should develop a clear national or institutional framework for humanized AI integration in higher education. Such a framework should prioritize transparency, accountability, and fairness in the use of AI systems. It should also encourage the development of AI tools that support personalized learning while still preserving the central role of human judgment in teaching and decision-making processes.

Finally, universities should promote a culture of balanced technology use where AI is seen as an assistant rather than a replacement for human intelligence. Students should also be trained to use AI responsibly for learning support rather than academic shortcuts. This will ensure that AI contributes positively to

improving educational quality, innovation, and sustainable academic development in Nigerian universities.

References

1. Aleven, V., Roll, I., McLaren, B. M., & Koedinger, K. R. (2016). Help helps, but only so much: Research on help seeking with intelligent tutoring systems. *International Journal of Artificial Intelligence in Education, 26*(1), 205–223. https://doi.org/10.1007/s40593-015-0089-1
2. Bhati, P., & Kumar, A. (2020). Use of digital platforms for information service delivery in academic libraries. *Library Philosophy and Practice*, 1–15.
3. Bornmann, L., & Leydesdorff, L. (2013). Statistical tests and research evaluation: A comment on the current debate. *Journal of Informetrics, 7*(1), 1–5. https://doi.org/10.1016/j.joi.2012.09.004
4. Brown, S. (2020). Digital competence and professional relevance of librarians in the digital age. *Journal of Library and Information Studies, 14*(2), 45–58.
5. Dadzie, P. S., Agyemang, F. G., & Yeboah, B. (2018). Accessibility and utilization of OPAC by students in academic libraries. *International Journal of Library Science, 6*(2), 35–44.
6. Das, S., & Dutta, A. (2021). Characterizing public emotions and sentiments in COVID-19 environment: A case study of India. *Journal of Human Behavior in the Social Environment, 31*(1–4), 154–167. https://doi.org/10.1080/10911359.2020.1847265
7. Frontiers Review. (2025). Digital technologies in socio-technical systems. *Frontiers in Education, 10*, 1–15.
8. Hider, P., & Harvey, R. (2008). *Organizing knowledge in a global society: Principles and practice in libraries and information centers*. Chandos Publishing.
9. Houghton-Jan, S., Helman, L., & Rubin, J. (2009). *Information literacy assessment: Standards-based tools and assignments*. Neal-Schuman.
10. IGI Global. (2025). Digital technologies. In *IGI Global Encyclopedia of information science and technology*. IGI Global.
11. Johnson, R. (2019). Cataloging standards and OPAC usability in academic libraries. *Cataloging & Classification Quarterly, 57*(4), 245–260.
12. Jones, T. (2018). Enhancing OPAC usability through interface redesign. *Journal of Academic Librarianship, 44*(3), 367–374.
13. Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274
14. Kumar, K., & Jyotishi, A. (2021). User-centered OPAC design and academic library services. *DESIDOC Journal of Library & Information Technology, 41*(2), 89–97.
15. Li, X., Zhang, Y., & Chen, R. (2025). Digital technologies and economic transformation. *Journal of Digital Economics, 12*(1), 45–62.
16. Mulla, K. R., & Chandrashekara, M. (2009). A study on the effective use of OPAC in academic libraries. *Annals of Library and Information Studies, 56*(3), 127–134.
17. OECD. (2015). *Students, computers and learning: Making the connection*. OECD Publishing.
18. Parasuraman, R., & Manzey, D. H. (2010). Complacency and bias in human use of automation: An attentional integration. *Human Factors, 52*(3), 381–410. https://doi.org/10.1177/0018720810376055
19. Patil, D., & Chingath, T. (2020). Digital literacy skills among academic professionals in the digital era. *International Journal of Information Studies, 10*(1), 21–34.
20. Peng, S., Cao, L., Zhou, Y., Ouyang, Z., Yang, A., Li, X., Jia, W., & Yu, S. (2022). A survey on deep learning for textual emotion analysis in social networks. *Digital Communications and Networks, 8*(5), 745–762. https://doi.org/10.1016/j.dcan.2021.10.006
21. Ribble, M. (2011). *Digital citizenship in schools* (2nd ed.). International Society for Technology in Education.
22. Risko, E. F., & Gilbert, S. J. (2016). Cognitive offloading. *Trends in Cognitive Sciences, 20*(9), 676–688. https://doi.org/10.1016/j.tics.2016.07.002
23. Rosen, L. D. (2012). *iDisorder: Understanding our obsession with technology and overcoming its hold on us* [Kindle version]. Palgrave Macmillan. https://kindle.amazon.com/work/idisorder-understanding-obsession-technology-overcoming/B005NTF0OY
24. Smith, A. (2017). Metadata standards and OPAC interoperability. *Library Resources & Technical Services, 61*(2), 89–102.
25. Smith, A. (2019). Professional development and cataloging practice in academic libraries. *Journal of Library Administration, 59*(6), 601–615.
26. Xie, I., & Joo, S. (2010). Factors affecting the usability of OPACs. *Journal of the American Society for Information Science and Technology, 61*(8), 1553–1564.
27. Yamamoto, J. (2011). The muddy field of social networking: Implications for teacher educators. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications* (pp. 1–8).