International Journal of Information Resource Management (IJIRM)
Volume 3, Number 4 (October, 2026)
E- ISSN: 1118-7786

ETHICAL USE OF AI-ENABLED CHATBOTS FOR ACADEMIC ACTIVITIES AMONG STUDENTS OF FEDERAL UNIVERSITY OF EDUCATION, ZARIA, KADUNA STATE, NIGERIA

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Abstract

The rapid proliferation of generative artificial intelligence (AI) has transformed higher education, shifting students from passive consumers of content to active co-creators using conversational agents. However, this shift raises critical questions regarding academic integrity, data privacy, and ethical utilization. This study investigated the ethical use of AI-enabled chatbots for academic activities among students of the Federal University of Education (FUE), Zaria. Employing a quantitative survey research design, the study targeted a population of 2,500 students, drawing a sample size of 385 using Cochran's formula and systematic sampling. A total of 355 valid, copies of structured questionnaire were physically administered and retrieved, yielding a response rate of 92%. The data collected were analyzed using descriptive statistics based on frequencies, percentages, means, standard deviations and inferential metrics. The findings revealed a high level of awareness and positive perceptions of AI chatbots such as ChatGPT, Claude, and Gemini for brainstorming, literature synthesis, and personalized explanation. However, empirical metrics indicated that usage is heavily tempered by significant bottlenecks, including inadequate digital infrastructure, limited prompt-engineering and digital literacy skills, and a glaring absence of institutional policy frameworks. The findings further revealed that data privacy concerns underline student vulnerability regarding data harvesting by third-party platforms. The study concludes that while AI chatbots hold immense transformative potential, unguided adoption threatens academic rigor and institutional integrity. It is recommended that the university management should formulate comprehensive institutional AI usage policies, integrate ethical AI literacy into general studies curricula, and upgrade campus Wi-Fi infrastructure to support equitable, secure, and responsible academic engagement.

Keywords: Artificial Intelligence, AI Chatbots, Academic Integrity, Ethical Use

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Introduction

Artificial Intelligence (AI), a term originally framed at the 1956 Dartmouth Summer Research Project by John McCarthy, denotes computational architectures engineered to emulate human cognitive functions such as automated reasoning, problem-solving, pattern recognition, and natural language generation (McCarthy, 1956; Dziuban & David, 2021). Over decades, the technological landscape has evolved from deterministic, rule-based expert systems to deep learning models and large language models (LLMs) capable of complex natural language processing (Russell & Norvig, 2021). Within higher education, this paradigm shift has disrupted traditional instructional design, redefining how learners source information, synthesize literature, and engage with scholarly discourse (Luckin, 2019; Zawacki-Richter, 2023).

Among the myriad digital technologies flooding academic ecosystems, generative AI chatbots such as OpenAI's ChatGPT, Anthropic's Claude, and Google's Gemini have emerged as ubiquitous companions for university students. Unlike traditional Learning Management Systems (LMS) such as Moodle and Canvas which primarily serve as administrative repositories for course materials, assignment uploads, and grade tracking, conversational AI tools act as interactive, personalized tutors available around the clock. These tools offer dynamic scaffolding, instant feedback, and real-time translation and summarization capabilities (Harrison, 2020; Hamal, 2022).

Despite these pedagogical advancements, the integration of conversational AI into everyday student routines introduces profound ethical dilemmas. Academic institutions face unprecedented challenges concerning academic integrity, plagiarism, over-reliance on automated synthesis, algorithmic bias, and the erosion of critical

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thinking skills (Gros, 2020; Aliyu, 2023). When students utilize AI chatbots without explicit ethical boundaries or methodological transparency, the line between assistive learning and intellectual dishonesty becomes blurred. Moreover, in developing economies like Nigeria, these ethical tensions intersect with infrastructural deficits, erratic power supplies, data privacy vulnerabilities, and a severe absence of institutional regulatory frameworks (Adebiyi & Adeyemo, 2020; Ojo & Olaleye, 2022).

While substantial global literature exists regarding the technological utility of AI, there is a paucity of empirical research focusing explicitly on the ethical dimensions of AI chatbot adoption among students in specialized Nigerian tertiary institutions, particularly the Federal University of Education (FUE), Zaria. This study bridges this gap by investigating usage patterns, ethical perceptions, and systemic impediments associated with AI chatbots in academic workflows.

Statement of the Problem

The advent of generative AI chatbots has unlocked immense opportunities for personalized learning and academic productivity in tertiary institutions. However, within Nigerian colleges of education and universities, the unguided and unregulated deployment of these technologies poses severe threats to academic integrity and intellectual development (Ojo & Olaleye, 2022; Aliyu, 2023). Students increasingly rely on AI chatbots for essay drafting, assignment execution, and thesis generation, often without proper citation, critical evaluation, or understanding of data privacy risks. Compounding these ethical concerns are systemic structural failures such as widespread infrastructural deficits, unreliable internet connectivity, restricted access to smart devices, limited digital literacy regarding effective prompt engineering, and a

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total absence of institutional policies governing AI usage among students in tertiary institutions.

At the Federal University of Education, Zaria (FUEZ), the exact extent to which students engage with AI chatbots, their awareness of academic ethics, and the barriers impeding responsible utilization remain empirically undocumented. This knowledge vacuum prevents institutional leadership from establishing balanced guidelines that safeguard academic standards while embracing technological innovation. Therefore, this study investigates the ethical utilization, perceived benefits, and operational bottlenecks of AI-enabled chatbots among students of FUEZ to provide actionable policy frameworks.

Research Questions

1. What specific types of AI-enabled chatbots are utilized by students of FUEZ for academic activities?
2. What is the level of confidence in utilizing AI chatbots for academic activities among students in FUEZ?
3. What are the perceived academic benefits derived from using AI chatbots among students of FUEZ?
4. What are the factors impeding the effective and responsible use of AI chatbots for academic activities among students in FUEZ?

Literature Review

Conceptualizing AI Chatbots

Artificial Intelligence is broadly defined as computational systems designed to execute tasks demanding human-like cognitive processing, including natural language comprehension, adaptive learning, and complex decision-making (Stanford University,

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2021). In contemporary academia, conversational AI models (such as GPT-based architectures) represent a monumental leap from static digital repositories. While Learning Management Systems (LMS) function as organizational backbones for course administration, conversational AI agents operate as interactive intellectual interlocutors, facilitating active, constructivist learning (Russell & Norvig, 2021).

Harrison (2022) argues that AI chatbots transform the pedagogical landscape by offering real-time, personalized scaffolding that accommodates diverse student learning paces. However, this transformation is fraught with tension. Wilson (2021) noted that while university students exhibit high enthusiasm for AI-driven productivity tools, their underlying digital literacy and comprehension of ethical citation remain critically low. This gap often leads to uncritical acceptance of "hallucinated" facts, factual inaccuracies, and subtle academic misconduct.

Ethical Imperatives and Academic Integrity

The integration of generative AI into student workflows has ignited intense debates regarding academic integrity and authorship. David (2021) argues that unrestricted reliance on chatbots for drafting academic papers undermines core educational competencies, such as critical inquiry, independent synthesis, and rigorous empirical analysis. When students bypass the cognitive struggle of writing through automated generation, the development of deep analytical skills is stunted.

Furthermore, data privacy constitutes a major ethical hazard. Commercial AI chatbots frequently log user prompts and personal academic data for model training, raising serious confidentiality and intellectual property issues (Kim, 2019). Aliyu (2023) observed that students in developing contexts are largely oblivious to these data harvesting practices, exposing them to privacy breaches. Compounding these ethical

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risks is the systemic policy vacuum in Nigerian tertiary institutions. As Ojo and Olaleye (2022) highlighted, very few universities possess explicit honor codes or explicit guidelines defining acceptable versus fraudulent AI use, leaving educators without standardized tools to evaluate student submissions fairly.

Impediments to Use of AI Chatbots for Academic Activities Among Students

The realization of AI's educational benefits is heavily mediated by socio-technical contexts. Adebiyi and Adeyemo (2020) demonstrated that infrastructural bottlenecks such as chronic power outages, unstable broadband connectivity, and high mobile data costs severely restrict equitable access to cloud-based AI tools among Nigerian undergraduates. These disparities create a digital divide where only affluent students with high-end smartphones and reliable home internet can leverage AI effectively, leaving disadvantaged peers further behind.

Moreover, limited digital literacy and a lack of formal training in prompt engineering hinder students from extracting optimal academic value from conversational agents, often reducing sophisticated tools to superficial plagiarism engines (Smith, 2021; Jones, 2023). Thus, a context-specific empirical assessment at FUEZ is imperative to map these dynamics accurately.

Methodology

This study adopted a descriptive survey research design to quantitatively examine the ethical utilization, perceptions, and challenges of AI chatbot usage among students. The target population comprised all undergraduate students enrolled at the Federal University of Education, Zaria, totalling approximately 2,500 students across various faculties. To achieve a statistically representative sample, Cochran's sample size formula (Cochran, 1977; Collins, 2021) was utilized, yielding a calculated sample size of

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385 participants. A multi-stage systematic sampling technique was employed to select respondents proportionally across different departments, academic levels, and gender categories, ensuring balanced representation.

The data collection was executed using a structured, self-administered questionnaire divided into sections capturing demographic profiles, types of AI tools utilized, self-rated confidence and digital literacy, perceived academic benefits, and operational/ethical impediments. Out of 385 questionnaires administered physically across campus, 355 valid responses were retrieved and deemed suitable for analysis, representing an effective response rate of 92%. Quantitative data were processed using descriptive statistics including frequencies, percentages, means, and standard deviations to establish baseline patterns, while variance and standard deviation metrics were computed for scaled variables.

Data Presentation and Discussions

RQ 1: What types of AI-enabled conversational tools and chatbots are utilized by students of FUEZ for academic activities?

Table 1: Distribution of AI-Enable Chatbots Utilized by Students of FUE Zaria

AI Tool Category	Frequency (f)	Percentage (%)
Generative AI Chatbots (e.g., ChatGPT, Claude, Gemini)	315	88.7%
Learning Management Systems	278	78.3%
AI-Powered Study & Flashcard Apps	180	50.7%
Automated Text-Summarization & Paraphrasing Tools	165	46.5%
Automated Assessment & Quiz Tools	150	42.3%
Language Translation and Grammar Correction Apps	125	35.2%
Video, Audio, and Content Creation AI Software	105	29.6%
Others	50	14.1%

Source: Field Survey (2026)

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Table 1 outlines the distribution of AI tools utilized by respondents for academic purposes. The data reveals an overwhelming reliance on Generative AI Chatbots (88.7%) among students at the Federal University of Education, Zaria, surpassing traditional administrative LMS platforms (78.3%). This indicates a major behavioural shift where students are no longer interacting with technology merely as passive recipients of uploaded course notes, but as active co-creators utilizing conversational agents for brainstorming, essay structuring, literature exploration, and complex concept simplification.

This finding corroborates Wilson (2021), who noted that university students actively seek out conversational agents for autonomous academic support outside formal institutional frameworks. However, the heavy reliance on text-summarization and paraphrasing apps (46.5%) alongside general chatbots signals an urgent need for ethical guidelines to prevent inadvertent academic dishonesty or intellectual shortcutting.

Research Question 2: What is the level of digital literacy and confidence in using AI tools by students of FUEZ in a Scale of 1-5, where 1=Not Confident at all and 5=Highly Confident)?

Table 2: Students' Self-Reported Confidence in Use of AI Chatbot in FUEZ

Confidence Level	Frequency (f)	Scale Value (x)	f(x)	$(x - \mu)$	$(x - \mu)^2$	$f(x - \mu)^2$
Not confident	35	1	35	-2.18	4.75	166.25
Somewhat confident	65	2	130	-1.18	1.39	90.09
Moderately confident	110	3	330	-0.18	0.03	3.30
Confident	90	4	360	+0.82	0.67	60.30
Highly confident	55	5	275	+1.82	3.31	182.05
Total	**355**		**1,130**			**502.00**
Mean (μ)						**3.18**
Variance (S^2)						**2.00**
Standard Deviation (σ)						**1.41**

Source: Field Survey (2026)

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Table 2 presents an analysis of students' self-reported confidence levels in using AI Chatbots, measured on a scale from 1 to 5, where 1 indicates no confidence and 5 signifies high confidence. A total of 355 students participated in this assessment. The distribution shows that the largest group, consisting of 110 students, falls into the "Moderately confident" category, with a score of 3, which aligns with the average confidence level. Students who are "Somewhat confident" (65 students) and "Confident" (90 students) follow, indicating a substantial portion of students possess moderate to high confidence in their AI chatbots usage. Fewer students report being "Not confident" (35 students) or "Highly confident" (55 students), suggesting that while most students are moderately to confidently engaged, there remains a smaller segment with low or very high confidence levels.

The mean confidence score is approximately 3.18, slightly above the midpoint of the scale, reflecting an overall moderate to positive confidence among students. The variance is 2.00, and the standard deviation is approximately 1.41, indicating a moderate spread in confidence levels; students' confidence varies but tends to cluster around the mean. The detailed calculations, including deviations from the mean and squared deviations, underpin this statistical interpretation, showing a distribution where most students' confidence levels are centered around moderate confidence, with some variability on either side. The data suggests that students generally possess a moderate degree of confidence in their ability to effectively use AI chatbots for academic activities, with room for growth in confidence among some of the students.

Research Question 3: What are the perceived academic benefits derived from using AI chatbots among students of FUEZ?

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Table 3: Perceived Benefits of Use of AI Chatbots by Students for Academic Activities

Perceived Benefit	Frequency (f)	Percentage (%)
Improved Learning Efficiency & Speed	290	81.7%
Personalized Learning Experience & Concept Simplification	250	70.4%
24/7 Academic Support & Instant Feedback	230	64.8%
Enhanced Engagement and Interactive Problem-Solving	220	62.0%
Access to Broad Explanations of Complex Scholarly Literature	210	59.2%
Significant Time-Saving in Assignment Preparation and Research	200	56.3%

Source: Field Survey (2026)

Table 3 shows the primary academic benefits perceived by students when integrating AI chatbots into their daily study workflows. The findings revealed that students overwhelmingly view AI chatbots as powerful catalysts for academic productivity. Improved learning efficiency (81.7%) and personalized learning experiences (70.4%) emerged as the primary advantages. Students reported that conversational AI tools act as patient, round-the-clock tutors (64.8%) capable of breaking down complex educational theories, pedagogical frameworks, and research methodologies into digestible explanations tailored to individual learning paces.

These findings resonate with Hamal (2022) and Harrison (2020), who emphasized that conversational AI democratizes access to personalized tutoring, which is otherwise scarce in overcrowded public tertiary institutions. However, these benefits also heighten the temptation of over-reliance, reinforcing the imperative for ethical institutional boundaries.

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Research Question 4: What structural, technical, and ethical factors impede the effective and responsible use of AI chatbots among students?

Table 4: Impediments to Effective and Ethical AI Chatbot Use

Impediment Factor	Frequency (f)	Percentage (%)
Poor Internet Connectivity & High Data Costs	210	59.2%
Limited Digital Literacy & Prompt-Engineering Skills	180	50.7%
Inadequate Institutional Support & Training Programs	150	42.3%
Limited Access to Reliable Smart Devices / Laptops	130	36.6%
Absence of Clear Institutional Policies & Ethical Guidelines	120	33.8%
Data Privacy, Confidentiality, & Intellectual Property Concerns	90	25.4%

Source: Field Survey (2026)

Table 4 shows the operational, infrastructural, and ethical barriers hindering optimal AI chatbot utilization. The barriers outlined highlight critical socio-technical bottlenecks. Poor internet connectivity (59.2%) and limited digital literacy (50.7%) are the most dominant impediments. Because cloud-based AI chatbots require stable, high-speed internet access, chronic network instability and exorbitant mobile data costs in Nigeria severely restrict consistent, meaningful academic engagement. This creates an equity gap where economically disadvantaged students are marginalized from digital scholarship.

Crucially, the absence of clear institutional policies (33.8%) and data privacy concerns (25.4%) directly address the core theme of ethical utilization. Students expressed deep uncertainty regarding what constitutes acceptable AI assistance versus outright academic fraud. In the absence of formal honor codes or university guidelines, students navigate grey areas where confidential research notes or sensitive academic data fed into third-party chatbots risk privacy breaches and intellectual property loss.

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This empirical reality supports the arguments of Aliyu (2023) and Kim (2019), who asserted that vague regulatory frameworks foster academic dishonesty and anxiety regarding data surveillance.

Conclusion

This empirical study investigated the ethical utilization, perceived benefits, and operational challenges of AI-enabled chatbots among students at the Federal University of Education, Zaria. The findings establish that generative AI chatbots have become indispensable academic companions, driving learning efficiency, personalized scaffolding, and round-the-clock academic support. However, unguided adoption in the face of severe infrastructural deficits, limited digital literacy, data privacy vulnerabilities, and a complete absence of institutional regulatory frameworks threatens academic integrity and equitable scholarship.

Realizing the transformative potential of conversational AI in Nigerian higher education requires a delicate balance between technological embrace and rigorous ethical governance. Universities can no longer afford to adopt a laissez-faire posture toward generative AI. Comprehensive institutional policies, proactive digital capacity building, and robust infrastructural investments are urgently required to transform AI chatbots from hidden vectors of academic misconduct into transparent, ethical tools for intellectual empowerment.

Recommendations

Based on the empirical findings of this study, the following four strategic recommendations are advanced:

1. The Management of the Federal University of Education, Zaria, in collaboration with the Academic Board, should immediately formulate and enact clear,

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transparent institutional guidelines and honor codes regarding the ethical use of AI chatbots in coursework, assignments, and research projects. These policies must explicitly delineate acceptable assistive boundaries (e.g., brainstorming, editing, structuring) from prohibited academic fraud (e.g., unacknowledged verbatim generation, fabricated citations), while establishing clear citation standards for AI assistance.

2. To bridge the digital divide and mitigate infrastructural barriers, the university administration, in partnership with the Tertiary Education Trust Fund (TETFund) and telecommunication stakeholders, must upgrade campus-wide broadband networks, deploy high-speed Wi-Fi hotspots in student hostels and libraries, and subsidize data access for academic purposes.
3. The University's ICT Center and General Studies Department should design and implement mandatory digital literacy and ethical AI training modules for all students. This curriculum must focus on prompt engineering, critical evaluation of AI outputs to counter algorithmic hallucinations, data privacy protection, and responsible academic integrity practices.
4. University authorities should provide guidance on secure, privacy-compliant AI engagement, educating students on the risks of inputting sensitive personal data or proprietary research materials into public cloud-based chatbots, thereby safeguarding academic confidentiality and intellectual property rights.

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