

EDUCATIONAL UTILISATION OF ARTIFICIAL INTELLIGENCE TOOLS FOR LEARNING: PATTERNS, ETHICS, AND CHALLENGES AMONG UNIVERSITY STUDENTS IN KWARA STATE, NIGERIA

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ABSTRACT

This study investigated the educational utilisation of Artificial Intelligence (AI) tools for learning among university students in Kwara State, Nigeria, focusing on utilisation patterns, perceived ethical compliance, and associated challenges. The study was motivated by limited institutional guidance on responsible AI use in higher education. A descriptive survey research design was adopted, and 398 undergraduate students were selected through multistage sampling techniques. Data were collected using a validated questionnaire and analysed using mean, standard deviation, and independent-samples t-test at the 0.05 level of significance. Findings revealed high utilisation of AI tools for academic activities such as idea generation, content clarification, research support, and self-assessment. Students indicated relatively high levels of ethical compliance in their use of AI tools; however, lower ratings were observed for adherence to institutional policies and avoidance of overdependence. The findings reflect students' self-reported perceptions of AI use rather than directly observed behaviour. In addition, institutional and infrastructural constraints were identified as major challenges to responsible AI utilisation. Gender analysis showed no significant differences in utilisation patterns or challenges, but a significant difference was found in awareness of institutional guidelines in favour of male students. The study concludes that while AI tools are widely utilised for learning, strengthened institutional guidelines and targeted AI literacy initiatives are required to promote responsible and effective use of AI tools in higher education. It is recommended that universities redesign assessments to emphasize higher-order thinking to reduce uncritical AI reliance.

Keywords: Artificial Intelligence Tools, Ethical Compliance, Utilisation Patterns, Challenges of AI, University Students

Introduction

The rapid advancement of Artificial Intelligence (AI) technologies has significantly reshaped teaching and learning practices in higher education globally. AI-powered tools such as intelligent tutoring systems, generative chatbots, automated feedback platforms, transcription tools, and adaptive learning applications are increasingly integrated into university learning environments to support personalised learning, improve access to information, and enhance academic efficiency (Holmes & Tuomi, 2022; Kasneci, *et al.*, 2023). As these technologies become more accessible, university students have emerged as prominent users of AI tools for academic purposes, particularly for idea generation, clarification of complex concepts, research support, and self-directed learning.

In the Nigerian higher education context, recent studies have reported increasing exposure to and use of AI tools among university students, driven largely by the expansion of digital learning platforms and the availability of freely accessible generative AI applications (Alimi, *et al.*, 2021; Alimi, *et al.*, 2024). However, empirical evidence from Nigerian universities suggests that institutional responses to AI adoption remain uneven, with limited integration of formal AI usage policies, structured guidance, or AI literacy programmes within many universities. For instance, prior local studies have documented gaps in institutional preparedness for emerging educational technologies, including insufficient policy frameworks and limited staff capacity to guide students on responsible technology use (Alimi, *et al.*, 2021). Within Kwara State universities specifically, no comprehensive empirical study has systematically examined how students utilise AI tools for learning in relation to existing institutional guidance and ethical expectations, thereby creating a context-specific knowledge gap that this study seeks to address.

Beyond patterns of utilisation, the ethical implications of AI use in higher education have become a central concern in contemporary educational discourse. Ethical issues associated with AI-assisted learning extend beyond general notions of academic misconduct to include complex questions about academic integrity, learner autonomy, authorship, and responsible dependence on technology. Ethical AI use in education may be conceptualised along a continuum ranging from acceptable AI-assisted learning where AI tools are used as supportive resources for understanding and skill development to unethical assistance, such as unacknowledged reliance on AI-generated content, misuse during assessments, or overdependence that undermines independent learning. A further distinction exists between individual unethical practices and explicit violations of institutional policies, which vary across institutions and are often poorly communicated to students (Perkins, Roe, & McKay, 2023; UNESCO, 2023).

Despite the growing prominence of these ethical concerns, many empirical studies focus primarily on students' frequency of AI use without sufficiently examining how students interpret ethical boundaries or navigate institutional expectations. The absence of a clear conceptual framework in many local studies has resulted in fragmented findings that describe AI usage behaviours without adequately explaining the ethical reasoning underpinning such behaviours. This study is therefore guided by a conceptual perspective that views students' AI utilisation as shaped by the interaction between individual usage patterns, ethical awareness and self-regulation, and institutional support structures, including policies, guidance, and infrastructural resources. Within this framework, responsible AI use is understood not merely as compliance with rules but as informed, reflective engagement with AI tools that supports learning while upholding academic integrity.

In addition to ethical considerations, university students in developing contexts face practical challenges that may constrain responsible AI utilisation. These include limited access to

reliable internet connectivity, high cost of premium AI tools, inadequate training opportunities, and uncertainty about acceptable versus unacceptable AI use. Such challenges are often intensified in contexts where institutional guidance is limited, potentially increasing students' reliance on personal judgement rather than clearly articulated ethical standards (Ouyang & Jiao, 2022; Tlili, *et al.*, 2023).

Furthermore, gender differences in access to information, awareness of institutional policies, and engagement with digital technologies continue to attract scholarly attention. While recent studies suggest narrowing gender gaps in technology usage, disparities persist in policy awareness and confidence in navigating emerging technologies (Bond, *et al.*, 2023; Lund & Wang, 2023). Examining gender-based differences within the context of AI utilisation and ethical awareness is therefore necessary for designing inclusive institutional interventions.

Against this background, this study examined the educational utilisation of AI tools for learning among university students in Kwara State by: (i) examined the patterns of utilisation of AI tools for learning among university students; (ii) determined the extent of students' ethical compliance in the use of AI tools for learning; (iii) identified the challenges associated with ensuring responsible utilisation of AI tools for learning; and (iv) investigated gender differences in students' perceived awareness of institutional guidelines regarding the utilisation of AI for learning. Grounding the investigation within a clear conceptual framework and a context-specific empirical focus, the study contributes to a more nuanced understanding of how AI tools are used, interpreted, and ethically negotiated within Nigerian higher education.

Research Questions

The following research questions are generated and answered in the study:

1. What are the patterns of utilisation of AI tools for learning among university students?
2. To what extent do university students comply with ethical standards in utilisation of AI tools for learning?
3. What challenges do university students face in ensuring the responsible utilisation of AI tools for learning?
4. Is there a difference between male and female university students in their perceived awareness of institutional guidelines regarding the utilisation of AI tools for learning?

Research Hypotheses

The following hypotheses were tested at 0.05 level of significance in this study:

- H₀₁:** There is no significant difference between male and female university students in patterns of utilisation of Artificial Intelligence (AI) tools for learning.
- H₀₂:** There is no significant difference between male and female university students in the challenges faced in ensuring the responsible utilisation of Artificial Intelligence (AI) tools for learning.

Methodology

This study adopted a descriptive survey research design to examine university students' utilisation of Artificial Intelligence (AI) tools for learning, their perceived ethical compliance, and the challenges associated with responsible AI use. The design was considered appropriate because it enabled the collection of self-reported data from a large population without manipulation of variables.

The population of the study comprised 88,552 undergraduate students drawn from three selected universities in Kwara State, Nigeria based on ownership which represents different ownership structures. This population figure was obtained from official student enrolment records provided by the academic planning units of the respective institutions for the 2024/2025 academic session. A sample size of 398 students was determined using the Raosoft Sample Size Calculator at a 95% confidence level and a 5% margin of error. A multistage sampling technique was employed in selecting participants. First, the three universities were purposively selected to ensure representation of ownership types. Second, faculties and departments within each university were selected through simple random sampling. Students were selected proportionately from the sampled departments based on gender to achieve balanced representation. Although complete gender-disaggregated population data were not uniformly available across the institutions, proportionate allocation within sampled departments was used to minimise gender bias.

Data were collected using a structured questionnaire titled Students' Educational Utilisation and Ethical Perceptions of Artificial Intelligence Questionnaire. The instrument comprised four sections covering demographic information, patterns of AI utilisation for learning, perceived ethical compliance in AI use, and challenges associated with responsible AI utilisation. Items were structured on a four-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (4). Sample items included statements such as "I use AI tools to clarify difficult academic concepts" and "I avoid overdependence on AI tools when completing assignments."

The instrument was subjected to content and face validity by five experts in educational technology, University of Ilorin, Ilorin, Nigeria, who assessed the relevance, clarity, and alignment of the items with the study objectives. Their feedback informed revisions to item wording and structure before final administration. Reliability of the instrument was established using Cronbach's Alpha, which yielded an overall coefficient of 0.83, indicating good internal consistency across the utilisation, ethical perception, and challenges components of the questionnaire.

Ethical compliance was measured through students' self-reported perceptions of their AI-related academic practices. It is acknowledged that self-reported measures of ethically sensitive behaviours are susceptible to social desirability bias, as students may be reluctant to admit unethical conduct. Consequently, the ethical compliance findings reflect perceived rather than directly observed behaviour and should be interpreted with caution. The study does not claim to measure actual ethical conduct but rather students' perceptions of responsible AI use within academic contexts.

Data collected were analysed using mean and standard deviation to answer the research questions, while independent-samples t-test was employed to test the hypotheses at the 0.05 level of significance. A benchmark mean score of 2.50 was adopted for decision-making. Ethical considerations were strictly observed throughout the study. Participants were informed of the purpose of the study, participation was voluntary, informed consent was obtained, and the confidentiality of responses was assured.

Results

Research Question One: What are the patterns of utilisation of AI tools for learning among university students in Kwara State?

Table 1: Patterns of AI tool Usage among University Students for Academic Learning

S/N	Items	Mean	Std
1.	I use AI tools to generate ideas before starting my assignments.	3.71	.45
2.	I interact with AI chatbots to clarify difficult topics in my courses.	3.43	.49
3.	I use AI-powered transcription tools to convert lectures into text for easier study.	3.48	.53
4.	I rely on AI-generated quizzes and flashcards for self-assessment.	3.45	.58
5.	I use AI tools to translate academic content into my preferred language.	3.43	.60
6.	I employ AI for organizing my study schedules and reminders.	3.40	.53
7.	I explore AI-powered research tools to find relevant academic papers.	3.40	.62
8.	I use AI to enhance my note-taking during lectures.	3.35	.57
9.	I prefer AI-assisted tutoring over traditional human tutoring.	3.55	.57
10.	I use AI-powered voice assistants (e.g., Siri, Google Assistant) to search for academic content.	3.43	.63
	Grand mean		
		3.46	

Results in Table 1 shows that university students actively utilise AI tools for various academic purposes, as all items recorded mean scores above the benchmark of 2.50. The highest mean score was recorded for the use of AI tools to generate ideas before starting assignments (Mean = 3.71, SD = 0.45), followed by preference for AI-assisted tutoring over traditional human tutoring (Mean = 3.55, SD = 0.57). These findings indicate that students value AI tools for creative support and personalised learning assistance. The lowest mean score was recorded for the use of AI tools to enhance note-taking during lectures (Mean = 3.35, SD = 0.57), although this still reflects a high level of utilisation. The grand mean of 3.46 indicates a generally high level of engagement with AI tools for learning among university students in Kwara State, suggesting that AI technologies have been widely integrated into students' academic activities.

Research Question Two: To what extent do University Students Comply with Ethical Standards in their Utilisation of Artificial Intelligence (AI) Tools for Learning?

Table 2: University Students' Ethical Compliance in the Utilisation of AI Tools for Learning

S/N	Ethical Compliance	Mean	Std. Dev.
1.	I use AI tools for learning purposes only.	3.42	0.81
2.	I avoid using AI tools to cheat during assessments.	3.36	0.88
3.	I acknowledge AI assistance when required.	3.28	0.91
4.	I follow my institution's rules on AI use.	3.19	0.94
5.	I do not submit AI-generated work as my own.	3.25	0.89
6.	I use AI tools responsibly when completing assignments.	3.47	0.78
7.	I respect academic integrity when using AI tools.	3.40	0.83
8.	I avoid overdependence on AI tools for learning.	3.12	0.97
9.	I use AI tools to support, not replace, my learning.	3.35	0.86
10.	I ensure ethical use of AI tools in my studies.	3.44	0.80

Table 2 reveals that students demonstrate a high level of ethical compliance in the utilisation of AI tools for learning, as all items recorded mean scores above the benchmark of 2.50. The highest levels of compliance were observed in using AI tools responsibly when completing assignments (Mean = 3.47, SD = 0.78) and ensuring ethical use of AI tools in academic work (Mean = 3.44, SD = 0.80). This indicates that students are generally mindful of responsible academic practices when using AI tools. However, relatively lower mean scores were recorded for avoiding overdependence on AI tools (Mean = 3.12, SD = 0.97) and following institutional rules on AI use (Mean = 3.19, SD = 0.94). Although these values still indicate high compliance, they suggest areas where institutional guidance and policy awareness could be strengthened. Overall, the results show that university students largely comply with ethical standards in their use of AI tools for learning.

Research Question Three: What challenges do university students in Kwara State face in ensuring the responsible use of AI tools for learning?

Table 3: Challenges in Ensuring Responsible Use of AI Tools for Learning

S/N	Items	Mean	Std. Dev.
1	Limited access to reliable internet makes it difficult to use AI tools responsibly.	3.24	0.85
2	I lack adequate knowledge of how to use AI tools ethically for academic work.	3.06	0.92
3	There is insufficient guidance from lecturers or the university on the proper use of AI tools.	3.31	0.81
4	The cost of subscribing or accessing quality AI tools is a major challenge.	3.19	0.88
5	There is fear of violating academic integrity rules when using AI tools.	2.91	0.95
6	I find it difficult to distinguish between responsible and irresponsible uses of AI tools.	2.99	0.96
7	AI tools sometimes provide inaccurate or misleading information that affects my work.	2.96	0.94
8	Lack of training opportunities on AI tool usage hinders responsible application.	3.19	0.89
9	I face challenges integrating AI tools into my study routine without over-dependence.	2.78	0.98
10	My academic workload leaves little time to explore responsible AI usage.	2.68	1.00
Grand Mean		3.03	

Table 3 indicated that students face several challenges in ensuring responsible utilisation of AI tools for learning. The most prominent challenge identified was insufficient guidance from lecturers or the university on the proper use of AI tools (Mean = 3.31, SD = 0.81). This was followed by limited access to reliable internet connectivity (Mean = 3.24, SD = 0.85), high cost of accessing quality AI tools (Mean = 3.19, SD = 0.88), and lack of training opportunities on AI usage (Mean = 3.19, SD = 0.89). Lower mean scores were recorded for challenges such as fear of violating academic integrity rules (Mean = 2.91, SD = 0.95), difficulty distinguishing responsible from irresponsible AI use (Mean = 2.99, SD = 0.96), and concerns about inaccurate AI-generated information (Mean = 2.96, SD = 0.94). The least reported challenges were difficulty integrating AI tools without overdependence (Mean = 2.78, SD = 0.98) and academic workload constraints

(Mean = 2.68, SD = 1.00). The grand mean of 3.03 indicates that institutional and infrastructural factors constitute the major barriers to responsible AI utilisation.

Research Question Four: Is there a difference between male and female university students in their perceived awareness of institutional guidelines regarding the utilisation of AI tools for learning?

Table 4: Difference between Male and Female Students in their Perceived Awareness of Institutional Guidelines Regarding the Utilisation of AI

Gender	N	Mean	Std. Deviation	Df	<i>t</i> -value	Sig. (p)
Male	195	3.80	0.61	396	2.36	0.018
Female	203	3.63	0.58			

Table 4 shows that male students recorded a higher mean score (Mean = 3.80, SD = 0.61) than female students (Mean = 3.63, SD = 0.58) in perceive awareness of institutional guidelines regarding regarding AI utilisation. The independent-samples *t*-test result revealed a statistically significant difference between male and female students ($t = 2.36$, $df = 396$, $p = 0.018$). This indicates that male students demonstrate significantly higher awareness of institutional ethical policies on AI use than their female counterparts.

Hypotheses Testing

The hypotheses raised in the study were tested at 0.05 level of significance.

H₀₁: There is no significant difference between male and female university students in their patterns of utilisation of Artificial Intelligence (AI) tools for learning.

Table 5: *t*-test showing no significant difference between Male and Female Students in Patterns of Utilisation of AI Tools for Learning

Gender	N	Mean	Std. Deviation	df	<i>t</i> -value	Sig. (p)
Male	195	3.48	0.59	396	1.12	0.263
Female	203	3.44	0.56			

Table 5 shows that male students recorded a mean score of 3.48 (SD = 0.59), while female students recorded a mean score of 3.44 (SD = 0.56). The *t*-test result revealed no statistically significant difference between the two groups ($t = 1.12$, $df = 396$, $p = 0.263$). Since the *p*-value is greater than 0.05, Hypothesis One was not rejected, indicating that gender does not significantly influence students' patterns of AI tool utilisation for learning

H₀₂: There is no significant difference between male and female university students in the challenges faced in ensuring the responsible utilisation of Artificial Intelligence (AI) tools for learning.

Table 6: *t*-test showing no significant difference between Male and Female Students in Challenges Faced in Ensuring Responsible Utilisation of AI Tools

Gender	N	Mean	Std. Deviation	df	<i>t</i> -value	Sig. (p)
Male	195	3.06	0.62	396	0.87	0.386
Female	203	3.01	0.60			

As shown in Table 6, male students recorded a mean score of 3.06 (SD = 0.62), while female students recorded a mean score of 3.01 (SD = 0.60). The t-test analysis revealed no statistically significant difference between male and female students ($t = 0.87$, $df = 396$, $p = 0.386$). Since the p-value exceeds the 0.05 level of significance, Hypothesis Two was not rejected, indicating that gender does not significantly influence the challenges faced by students in ensuring responsible AI utilisation.

Discussion of Findings

The findings of this study revealed a paradox at the heart of AI utilisation among university students in Kwara State. While students report high engagement with AI tools across academic activities including idea generation, clarification of complex concepts, research support, self-assessment, and personalised tutoring their claimed ethical compliance exists alongside signs of potential overreliance. The high grand mean score indicates that AI has become deeply integrated into students' learning routines, reflecting both acceptance and dependence. This mirrors global trends where generative AI and intelligent learning systems enhance academic efficiency and performance (Kasneci, *et al.*, 2023; Chan & Hu, 2023). However, the study uncovers a subtle tension: students assert responsible AI use, avoidance of cheating, and respect for academic integrity, yet lower scores for avoiding overdependence and strict adherence to institutional rules suggest a gap between ethical self-perception and actual practice. This tension raises critical questions about whether ethical compliance is fully internalised or is aspirational, influenced by limited policy awareness and infrastructural constraints, corroborating Perkins, *et al.* (2023), who observed that unclear institutional frameworks can compromise consistent ethical behaviour.

Furthermore, the study highlights structural and contextual factors that mediate this tension. Insufficient guidance from lecturers, limited access to reliable internet, high costs of premium AI tools, and lack of training opportunities were reported as major challenges to responsible AI use. While gender did not significantly influence patterns of utilisation or the challenges faced, male students demonstrated higher awareness of institutional ethical policies, suggesting differential exposure to formal guidance and institutional communication. This reinforces the idea that ethical engagement with AI is not solely a function of individual morality but is deeply shaped by institutional support, policy clarity, and access to enabling resources (Bond, *et al.*, 2023; Lund & Wang, 2023). Consequently, fostering truly responsible AI use requires universities to not only promote AI literacy and ethical awareness but also to critically address the structural conditions that may encourage dependence, ensuring that AI complements rather than substitutes independent academic effort.

Conclusion

The findings of this study revealed that Artificial Intelligence (AI) tools have become indispensable in the academic lives of university students in Kwara State, with high utilisation across idea generation, concept clarification, research support, and personalised learning. Students demonstrated strong ethical awareness in their use of AI, yet gaps remain in adherence to institutional guidelines and avoidance of overreliance on these tools. The study underscores that while AI enhances learning efficiency and engagement, responsible use is shaped not only by individual choices but also by the clarity of institutional guidance and access to necessary resources. To maximise the benefits of AI in higher education, universities must prioritise structured AI literacy programmes, clear policy communication, and robust infrastructural support, including reliable internet and affordable access to quality AI tools. By addressing these gaps,

institutions can foster a culture of responsible AI utilisation, ensuring that technology complements rather than compromises academic integrity. Ultimately, integrating AI responsibly promises to transform learning experiences, empower students, and prepare them for an increasingly digital academic and professional landscape.

Recommendations

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

1. Universities should redesign assessments to emphasise higher-order thinking through reflective tasks, oral presentations, project-based work, and supervised assessments, thereby reducing uncritical dependence on AI tools.
2. AI-detection tools should not be used as sole evidence of misconduct. Clear assessment guidelines and pedagogical engagement should take precedence over surveillance-based approaches.
3. Responsible AI use and academic integrity should be integrated into general studies and discipline-specific courses to foster ethical reasoning and clarify acceptable AI practices.
4. Continuous professional development should equip lecturers with skills for AI-aware assessment design and ethical guidance to ensure consistent institutional practice.

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