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RESEARCH ARTICLE

Artificial Intelligence in Architectural Education: assessing Awareness, Usage, and Institutional Readiness in Selected Universities in South-East Nigeria

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) is reshaping architectural education and practice globally. However, its integration within Nigerian architectural schools remains limited. This study examines AI awareness, usage patterns, and institutional readiness in selected universities in South-East Nigeria, namely: University of Nigeria Enugu Campus (UNEC), Imo State University Owerri (IMSU), and Gregory University Uturu (GUU). A descriptive cross-sectional quantitative survey design was adopted. Data were collected from 90 valid respondents comprising students and academic staff using structured questionnaires and analysed using descriptive statistics, correlation analysis, and Principal Component Analysis (PCA). Findings reveal high awareness of AI concepts, with over 75% of respondents indicating familiarity, and strong recognition of its relevance to architectural education (88.9%). However, actual usage remains low, as 46.6% of respondents reported not using AI tools. Institutional readiness indicators such as infrastructure availability, staff training, and curriculum flexibility were also rated poorly. PCA results identified three key dimensions influencing AI adoption: institutional readiness (31.2%), positive AI attitude (18.5%), and ethical/creative concerns (12.1%). Findings show that "familiarity" and "understanding" have a substantial positive relationship ($r=0.73$) and a moderate correlation ($r\approx0.5$) with "relevance." Furthermore, a cluster ($r=0.44–0.61$) of "Infrastructure," "Staff training," "Curriculum flexibility," and "Institution readiness" indicates common institutional capacity. The study concludes that although awareness of AI is high, structural and pedagogical limitations hinder effective integration, requiring curriculum reform, staff training, infrastructure development, and the establishment of ethical frameworks to support responsible AI adoption in architectural education.

Keywords: *Artificial Intelligence; Architectural Education; Awareness; Usage; Institutional Readiness*

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1. INTRODUCTION

AI is increasingly reshaping higher education globally, influencing teaching, assessment, and institutional governance (AlBlooshi, 2025; Mosha et al., 2026). Globally, higher education institutions are increasingly exploring the integration of AI technologies into teaching and learning processes (UNESCO, 2021). Recent studies indicate that AI is reshaping pedagogical approaches, enhancing personalized learning, and influencing curriculum design across disciplines (Zawacki-Richter et al., 2024; AlBlooshi, 2025).

Architectural education has also historically evolved in response to technological advancements, shifting from manual drafting to computer-aided design (CAD) and Building Information Modeling (BIM), which have significantly transformed design pedagogy and professional practice (Groat & Wang, 2013; Eastman et al., 2018). In recent years, Artificial Intelligence (AI) has emerged as a disruptive force in the architecture, engineering, and construction (AEC) industry, offering capabilities in generative design, performance simulation, automation, and data-driven decision-making (Russell & Norvig, 2022; Picon, 2020).

In architectural education specifically, emerging research suggests that AI-supported design studios and digital learning environments can improve design exploration, efficiency, and student engagement (Zhang & Li, 2025). Globally, several architecture programs have begun integrating AI tools into teaching and learning, with documented efforts in curriculum reform, AI literacy development, and pedagogical innovation (Crompton & Burke, 2023; Adamakis & Rachiotis, 2025).

However, the adoption of AI in higher education remains uneven, particularly in developing regions. In African universities, the integration of AI is still at an exploratory stage, constrained by infrastructural limitations, policy gaps, funding challenges, and insufficient staff capacity (Ocen et al., 2025; Oguntona & Emere, 2025., Mosha et al., 2026). In Nigeria, architectural education continues to rely largely on traditional and semi-digital pedagogical approaches, with curriculum reforms often trailing behind rapid technological advancements shaping contemporary professional practice (Dare-Abel & Uwakonye, 2015; Obioha et al., 2015).

While awareness of AI is gradually increasing among Nigerian students and educators through informal channels, structured integration into architectural curricula remains limited (Abubakar et al., 2024; Cheche et al., 2024). Existing studies in South-East Nigeria have primarily focused on students' awareness and individual use of AI tools, without adequately addressing the perspectives of academic staff or the institutional readiness required for effective integration (Cheche et al., 2024).

Moreover, recent literature emphasises that successful AI adoption in higher education depends not only on awareness and usage but also on institutional preparedness, including curriculum design, policy frameworks, and ethical considerations (Aguado-García et al., 2025; Qian, 2025). Despite this, there remains a lack of empirical studies that simultaneously examine these dimensions within architectural education in Nigeria.

This study therefore addresses this gap by assessing AI awareness, usage patterns, and institutional readiness from both student and lecturer perspectives across selected universities in South-East Nigeria. By doing so, it provides a more comprehensive understanding of the current state of AI integration and offers evidence to inform curriculum reform, capacity building, and policy development.

The study aimed to examine the current state of architectural education with respect to artificial intelligence awareness, usage patterns, and institutional readiness in selected universities in South-East Nigeria. The following objectives were outlined: (1) to assess the level of AI awareness among architectural students and lecturers; (2) to examine the extent and patterns of AI tool usage in architectural teaching and learning; and to investigate the institutional readiness of architecture programs for AI integration into the curriculum.

2. LITERATURE

Artificial Intelligence (AI) refers to computational systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, perception, and decision-making (Russell & Norvig, 2022). Recent studies highlight that generative AI tools are transforming student learning experiences, enabling personalized learning and automated academic support, while also raising concerns about academic integrity and overreliance (Bin Jwair, 2025; Qian, 2025).

In architecture, AI applications span generative design, parametric optimisation, environmental performance simulation, construction automation, and smart building systems (Picon, 2020). Globally, AI is rapidly transforming architectural practice and education. Architecture schools in developed contexts are increasingly incorporating AI tools to enhance design creativity, efficiency, and data-informed decision-making (Crompton & Burke, 2023; Adamakis & Rachiotis, 2025).

In African higher education, AI adoption remains uneven. While awareness is growing, institutional integration is constrained by infrastructural limitations, inadequate policy frameworks, funding shortages, and faculty capacity gaps (Ocen et al., 2025; Oguntona & Emere, 2025; Mosha et al., 2026). Nigerian architectural education has traditionally emphasised manual design processes with gradual integration of digital tools such as Computer-Aided Architectural Design (CAAD) and Building Information Modeling (BIM). However, curriculum reforms have often lagged behind technological developments (Dare-Abel & Uwakonye, 2015; Obioha et al., 2015).

Recent studies indicate that architecture students in Nigeria are increasingly exposed to emerging technologies through informal channels, yet structured curricular integration remains limited (Abubakar et al., 2024; Cheche et al., 2024). Specifically in South-East Nigeria, students demonstrate moderate awareness of AI tools for architectural design but face significant barriers related to access, training, and institutional support (Cheche et al., 2024). Scholars also highlight ethical concerns, including threats to creative agency, authorship, academic integrity, algorithmic bias, and the need for culturally relevant applications in design education (Adamakis & Rachiotis, 2025; Olojede & Olakulehin, 2024).

Despite the rapid growth of AI-related studies, much of the existing literature remains concentrated in developed contexts, with limited empirical evidence from African architectural education systems (Ocen et al., 2025; Mosha et al., 2026). The existing studies largely overlook institutional structures and curriculum-level integration, focusing instead on individual user experience. This study builds upon and extends the above literature by providing a broader empirical assessment that includes both students and academic staff while focusing on institutional readiness, an area that remains under-researched in the Nigerian architectural education context

3. MATERIALS AND METHODS

This study adopted a quantitative cross-sectional survey approach (Creswell & Creswell, 2018) to examine AI awareness, usage, and institutional readiness in architectural education across three selected universities in South-East Nigeria: The University of Nigeria Enugu Campus (federal), Imo State University Owerri (state), and Gregory University Uturu (private). The respondents comprised 90 undergraduate and postgraduate architecture students, as well as academic staff, purposively selected from the three institutions. An online structured questionnaire was administered, containing a Likert-scale that measured demographic characteristics, AI awareness, usage frequency, institutional readiness (infrastructure, staff training, curriculum flexibility), and ethical concerns, alongside open-ended qualitative questions to capture perceived barriers and challenges. Quantitative data were analysed using descriptive statistics (frequencies, percentages), Pearson correlation, and Principal Component Analysis with Varimax rotation. Qualitative responses from open-ended questions were analysed thematically to complement the quantitative findings. Ethical protocols were observed, participation was voluntary, informed consent was obtained online, and confidentiality and anonymity were ensured.

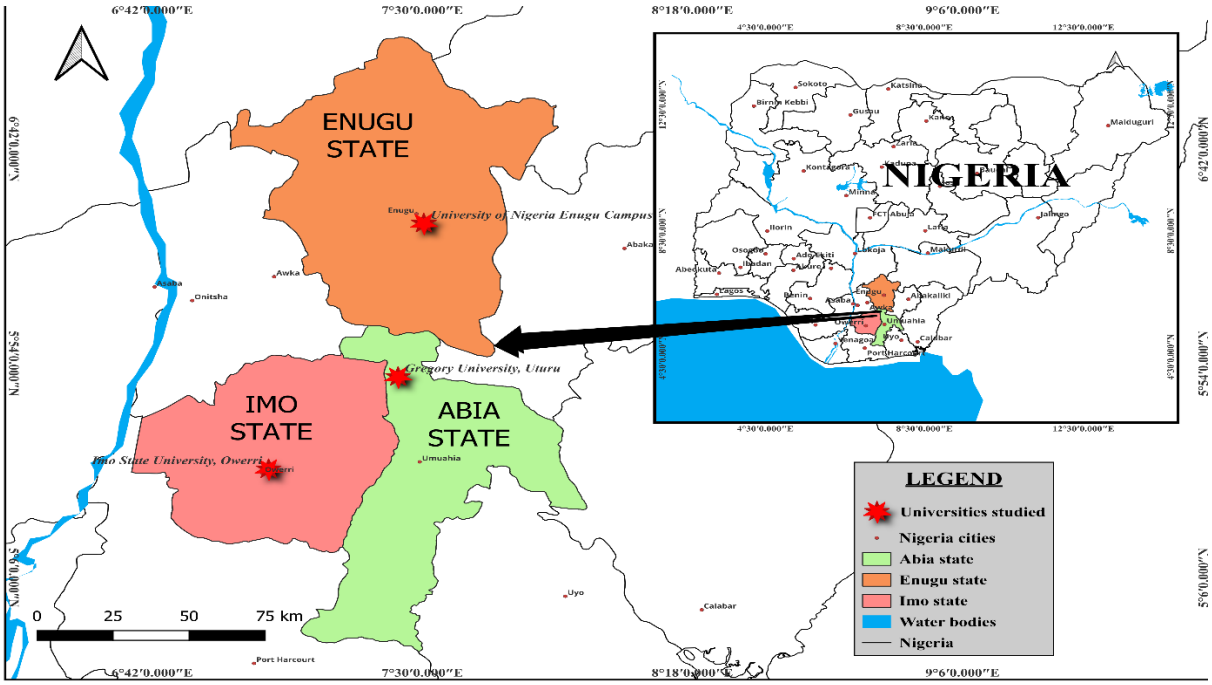

Figure 1. The Study area showing the three Universities

4. RESULTS AND DISCUSSION

Table 1. Respondent's Demographic Information

	Frequency	Percent
1. Institution		
University of Nigeria Enugu Campus	26	28.9%
Imo State University Owerri	43	47.8%
Gregory University Uturu	21	23.3%
2. Status		
Undergraduate student	52	57.8%
Postgraduate student	20	22.2%
Academic staff	18	20.0%
3. Student Level		
100 Level	18	25.0%
200 Level	14	19.4%
300 Level	11	15.3%
400 Level	9	12.5%
MSc	12	16.7%
PhD	8	11.1%
4. Gender		
Male	68	75.6%
Female	22	24.4%

Table 1 presents the demographic characteristics of the respondents from three selected institutions: University of Nigeria, Enugu Campus (UNEC); Imo State University, Owerri (IMSU); and Gregory University, Uturu (GUU). Of the 90 valid responses, 43 respondents (47.8%) were from IMSU, 26 respondents (28.9%) from UNEC, while 21 respondents (23.3%) were from Gregory University.

Regarding respondent status, undergraduate students constituted the majority with 52 respondents (57.8%), followed by postgraduate students with 20 respondents (22.2%), while academic staff represented 18 respondents (20.0%). This indicates

that the study largely captured the perspectives of students, who represent the major users and beneficiaries of architectural education systems.

The distribution by academic level revealed that 100-level students formed the largest group (25.0%), followed by 200-level students (19.4%), 300-level students (15.3%), 400-level students (12.5%), MSc students (16.7%), and PhD students (11.1%). In terms of gender, males accounted for 75.6% of respondents while females represented 24.4%, reflecting the traditionally male-dominated nature of architecture programmes within many Nigerian institutions.

Table 2. Respondents' agreement Levels on AI Familiarity, Application, Training, Infrastructure, Curriculum Flexibility, Institutional Readiness, and Ethical Guidelines

Variable	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
Familiarity with AI Concept	2	2.2%	3	3.3%	14	15.6%	38	42.2%	33	36.7%
Understanding AI Application in Architecture	2	2.2%	4	4.4%	17	18.9%	34	37.8%	33	36.7%
AI Relevant to Future of Architectural Education	1	1.1%	1	1.1%	8	8.9%	30	33.3%	50	55.6%
Department Has Adequate Digital Infrastructure	10	11.1%	24	26.7%	27	30%	16	17.8%	13	14.4%
Academic Staff Adequately Trained to Teach AI	14	15.6%	26	28.9%	22	24.4%	15	16.7%	13	14.4%
Curriculum Flexible Enough to Accommodate AI	11	12.2%	21	23.3%	24	26.7%	22	24.4%	12	13.3%
Institution Ready to Integrate AI	5	5.6%	15	16.7%	27	30%	27	30%	16	17.6%
Ethical guidelines should be established before AI introduction	2	2.2%	3	3.3%	10	11.1%	22	24.4%	53	58.9%
The use of AI may reduce creativity in architectural design	28	31%	13	14.8%	13	14.8%	19	21.2%	17	19%
AI tools may threaten originality and authorship in architectural education	32	35.9%	10	11.2%	8	8.5%	17	19%	23	25.4%

Table 2 presents respondents' levels of agreement on AI familiarity, application, institutional readiness, and ethical concerns in architectural education. Overall, the findings indicate a high level of awareness and positive perception of AI, but moderate preparedness for institutional implementation.

Most respondents demonstrated familiarity with AI concepts, as 78.9% agreed or strongly agreed that they were familiar with AI, while 74.5% indicated an understanding of AI applications in architecture. Similarly, respondents strongly recognized the importance of AI for the future of architectural education, with 88.9% agreeing that AI is relevant to future architectural training.

However, institutional readiness appeared limited. A larger proportion of respondents disagreed that their departments had adequate digital infrastructure (37.8%) and that academic staff were sufficiently trained to teach AI (44.5%). Views on curriculum flexibility were mixed, although more respondents leaned toward agreement (37.7%) than disagreement (35.5%), suggesting uncertainty about the curriculum's capacity to accommodate AI integration. Perceptions of institutional readiness to integrate AI were also divided, with 47.6% agreeing and 22.3% disagreeing, while a significant proportion remained neutral (30%).

Ethical concerns were strongly emphasized, as 83.3% supported the establishment of ethical guidelines before AI introduction. At the same time, respondents expressed mixed opinions regarding AI's potential negative effects on creativity,

originality, and authorship in architectural education, indicating ongoing concerns about the implications of AI use despite its perceived benefits.

Overall, the data suggest that while awareness and acceptance of AI in architectural education are high, gaps in infrastructure, staff training, and institutional preparedness may hinder effective implementation.

Table 3. AI use among the study respondents

Frequency of AI Use	Frequency	Percentage
Daily	10	11.1%
Few times weekly	24	26.5%
3-4 times weekly	7	7.9%
1-2 times weekly	7	7.9%
Not at all	42	46.6%
TOTAL	90	100%

Table 3 shows the frequency of AI use among respondents. The findings indicate generally low AI usage, as 46.6% of respondents reported not using AI at all, representing the largest proportion. Among those who use AI, 26.5% reported using it a few times weekly, while 11.1% used AI daily. Smaller proportions used AI 3–4 times weekly (7.9%) and 1–2 times weekly (7.9%). Overall, the results suggest that despite awareness of AI, actual usage among respondents remains relatively limited and inconsistent.

Table 4. AI use among the study respondents

Variables	Yes		No		Not sure	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Heard of AI Tools for Generative Design	71	78.9%	19	21.1%	-	-
Heard of AI Tools for Design Automation	62	68.9%	28	31.1%	-	-
AI Tools Currently Taught in Courses	15	16.7%	59	65.6%	16	17.8%
Personally Used AI Tool for Architecture	48	53.3%	42	46.7%	-	-

The findings in Table 4 reveal high awareness of AI tools for architecture but low formal educational integration. A majority of respondents had heard of AI tools for generative design (78.9%) and design automation (68.9%), indicating strong awareness of AI applications. However, only 16.7% reported that AI tools are currently taught in architectural courses, reflecting limited curriculum integration. Meanwhile, 53.3% had personally used AI tools for architecture, suggesting moderate personal adoption despite low institutional exposure. Overall, awareness and personal use are increasing, but formal incorporation into architectural education remains inadequate

Table 5. Major Challenges (multiple responses)

Challenge	Frequency	Percentage
Curriculum rigidity	35	43.8%
Lack of trained staff	30	37.5%
Funding constraints	25	31.3%
Ethical concerns	20	25%
Resistance to change	15	18.8%

Table 5 presents the major challenges affecting the integration of AI into architectural education in the selected universities. Since multiple responses were allowed, the percentages exceed 100%. The findings show that curriculum rigidity was the most frequently identified challenge, reported by 43.8% of respondents, suggesting that existing curricula may not be flexible enough to accommodate emerging AI technologies. This was followed by a lack of trained staff (37.5%), indicating

inadequate faculty capacity for AI-related teaching and implementation. Funding constraints (31.3%) also emerged as a significant barrier, reflecting limitations in providing digital infrastructure and technological resources.

Additionally, ethical concerns (25%) highlight issues relating to originality, academic integrity, and responsible AI use, while resistance to change (18.8%) suggests some level of reluctance toward adopting new technologies. Overall, the findings indicate that institutional, financial, and pedagogical factors constitute major barriers to AI integration in architectural education.

Correlation Analysis

Pearson correlations computed on 80 complete cases for the following ten numeric variables: Fam – Familiarity with AI (1–5); Und – Understanding AI application (1–5); Rel – AI relevance to future education (1–5); Infra – Adequate digital infrastructure (1–5); Train – Staff trained to teach AI (1–5); Flex – Curriculum flexible for AI (1–5); Ready – Institution ready to integrate AI (1–5); Reduce – AI may reduce creativity (1–5, reverse-coded for interpretation); Threat – AI may threaten originality (1–5); Ethic – Ethical guidelines needed (1–5).

Table 6. Correlation Matrix

	Fam	Und	Rel	Infra	Train	Flex	Ready	Reduce	Threat	Ethic
Fam	1.00									
Und	0.73	1.00								
Rel	0.51	0.48	1.00							
Infra	0.22	0.18	0.15	1.00						
Train	0.19	0.21	0.12	0.61	1.00					
Flex	0.25	0.23	0.20	0.44	0.49	1.00				
Ready	0.30	0.27	0.26	0.48	0.53	0.58	1.00			
Reduce	-0.28	-0.24	-0.19	-0.11	-0.08	-0.14	-0.10	1.00		
Threat	-0.15	-0.12	-0.08	0.02	0.01	-0.05	-0.03	0.42	1.00	
Ethic	0.21	0.18	0.25	0.06	0.04	0.10	0.12	-0.05	0.11	1.00

Table 6 shows the correlation matrix for the 10 variables on the level of respondents' AI Familiarity, Application, Training, Infrastructure, Curriculum Flexibility, Institutional Readiness, and Ethical Guidelines. The results indicate a strong positive correlation between 'Familiarity' and 'Understanding' ($r=0.73$), and both correlate moderately with 'Relevance' ($r\approx0.5$). Also, 'Infrastructure', 'Staff training', 'Curriculum flexibility' and 'Institution readiness' form a cluster ($r=0.44–0.61$), indicating shared institutional capacity. In the same vein, 'Reduce creativity' and 'Threaten originality' correlate moderately ($r=0.42$); both show weak negative association with Familiarity ($r\approx$ -0.3 and -0.15), suggesting more knowledgeable respondents are less concerned. Similarly, 'Ethical guidelines' has very weak or no correlation with other items, indicating it is seen as an independent requirement.

Principal Component Analysis (PCA)

PCA was performed on the same 10 variables after standardisation (mean=0, variance=1).

Kaiser-Meyer-Olkin (KMO) measure = 0.67 (adequate for PCA).

Bartlett's test of sphericity: $p < 0.001$ (correlations are not random).

Table 7. Components extracted loading with eigenvalues of at least one in the PCA

Component	Extraction Sums of Squared Loadings		
	Eigenvalue	% of Variance	Cumulative %
PC1	3.12	31.2%	31.2%
PC2	1.85	18.5%	49.7%
PC3	1.21	12.1%	61.8%
PC4	1.01	9.4%	71.2%

From Table 7, the first three components explain 61.8% of total variance.

Table 8. Rotated Component Matrix with communalities for the three components in the PCA

Variables (AI awareness, usage, and institutional readiness)	Code	PC1	PC2	PC3
Department Has Adequate Digital Infrastructure	Infra	0.79*	0.12	-0.05
Academic Staff Adequately Trained to Teach AI	Train	0.77*	0.09	0.02
Curriculum Flexible Enough to Accommodate AI	Flex	0.68*	0.21	-0.10
Institution Ready to Integrate AI	Ready	0.72*	0.24	-0.08
Familiarity with AI Concept	Fam	0.23	0.82*	-0.11
Understanding AI Application in Architecture	Und	0.19	0.79*	-0.07
AI Relevant to Future of Architectural Education	Rel	0.18	0.65*	0.06
The use of AI may reduce creativity in architectural design	Reduce	-0.10	-0.28	0.74*
AI tools may threaten originality and authorship in architectural education	Threat	0.02	-0.11	0.68*
Ethical guidelines should be established before AI introduction	Ethic	0.09	0.15	0.42*

Table 8 shows that the Principal Component Analysis (PCA) with Varimax rotation identified three principal components that explain the underlying dimensions of respondents' perceptions regarding the integration of Artificial Intelligence (AI) into architectural education. The first principal component (PC1) accounted for 31.2% of the total variance and was interpreted as Institutional Readiness. This component recorded high loadings for variables relating to institutional infrastructure, staff training, curriculum flexibility, and overall institutional preparedness for AI adoption. It represents the capacity of architecture departments to successfully integrate AI into teaching and learning.

The second principal component (PC2), which explained 18.5% of the total variance, was labelled Positive AI Attitude. It was primarily influenced by respondents' familiarity with AI technologies, their understanding of AI applications in architecture, and their belief in the future relevance of AI within the profession. Higher scores on this component indicate a stronger positive disposition toward the adoption of AI in architectural education.

The third principal component (PC3) accounted for 12.1% of the total variance and was interpreted as Ethical and Creative Concerns. This component captured respondents' concerns regarding the potential reduction of creativity and originality resulting from AI use, as well as, to a lesser extent, the need for ethical guidelines to regulate AI implementation. It reflects respondents' cautious attitudes toward the possible negative implications of AI in architectural education.

Overall, the findings reveal a high level of awareness and optimism regarding AI among respondents. More than three-quarters of the participants agreed or strongly agreed that AI is relevant to architectural education, and the majority indicated that they were familiar with generative AI and design automation tools. Despite this positive outlook, institutional integration

of AI remains limited. Only about 17% of respondents reported that AI-related content is currently taught within their academic programmes, while institutional infrastructure, staff training, and curriculum flexibility were generally rated as inadequate.

The results also identified curriculum rigidity and the lack of adequately trained academic staff as the most significant barriers to AI integration. Furthermore, although approximately 35% of respondents expressed concerns that AI could diminish creativity, there was a much stronger consensus (approximately 83%) supporting the establishment of ethical guidelines before AI is formally integrated into architectural curricula.

Collectively, the PCA findings indicate that Institutional Readiness, Positive AI Attitude, and Ethical and Creative Concerns are three distinct dimensions influencing AI adoption in architectural education. This suggests that improving institutional infrastructure and staff capacity alone may not guarantee greater acceptance of AI. Equally important are strategies that address ethical concerns, reduce fears about the impact of AI on creativity, and promote its responsible and effective use within architectural education.

Discussion of findings

The findings of this study reveal a notable paradox: while awareness of AI concepts and tools is high among architecture students and staff in South-East Nigerian universities, actual usage and formal institutional integration remain strikingly low. Over 75% of respondents demonstrated familiarity with AI, and nearly 89% acknowledged its relevance to the future of architectural education. Yet, almost half (46.6%) reported no use of AI tools at all, and only 16.7% indicated that AI is currently taught within their courses. This gap between awareness and practice aligns with earlier observations in African higher education, where infrastructural deficits, policy gaps, and insufficient faculty training hinder effective AI adoption (Oguntona & Emere, 2025; Mosha et al., 2026).

The correlation analysis showed a strong positive relationship between familiarity with AI and understanding of its applications ($r = 0.73$), suggesting that exposure improves conceptual grasp. However, neither familiarity nor understanding correlated strongly with institutional readiness indicators such as digital infrastructure, staff training, or curriculum flexibility. This implies that individual awareness alone does not drive systemic change—a finding consistent with the broader literature on technology adoption in education (Crompton & Burke, 2023; Qian, 2025).

Principal Component Analysis (PCA) extracted three distinct dimensions: Institutional Readiness (explaining 31.2% of variance), Positive AI Attitude (18.5%), and Ethical & Creative Concerns (12.1%). The separation of these components is methodologically significant. It indicates that institutional capacity—infrastructure, trained staff, and flexible curricula—exists as an independent factor from individual attitudes toward AI. In other words, even when students and lecturers are enthusiastic about AI, the absence of structural support prevents meaningful integration. This finding challenges any assumption that simply raising awareness will lead to adoption; deliberate investment in institutional preparedness is indispensable.

Respondents expressed mixed but notable concerns about AI's impact on creativity and originality. Approximately 35% agreed that AI may reduce creativity, and 44% agreed that it may threaten authorship. Interestingly, the correlation analysis showed weak negative associations between AI familiarity and these concerns ($r \approx -0.28$ for creativity; -0.15 for originality), suggesting that more knowledgeable individuals are slightly less fearful. Nevertheless, an overwhelming 83.3% supported the establishment of ethical guidelines before introducing AI into curricula. This highlights a demand for governance frameworks—a point echoed in recent studies on AI ethics in design education (Adamakis & Rachiotis, 2025; Olojede & Olakulehin, 2024).

The most frequently cited barriers—curriculum rigidity (43.8%) and lack of trained staff (37.5%)—are systemic issues that require institutional and policy-level interventions. These barriers are not unique to Nigeria but are particularly acute in resource-constrained settings (Ocen et al., 2025). Funding constraints (31.3%) and resistance to change (18.8%) further compound the problem.

Overall, the discussion reinforces that AI integration in architectural education is currently limited not by student or staff resistance, but by inadequate infrastructure, untrained faculty, and rigid curricula. Addressing these structural deficits is a prerequisite for any meaningful AI adoption.

5. CONCLUSION

This study assessed AI awareness, usage patterns, and institutional readiness in three selected universities in South-East Nigeria. The findings conclude that awareness of AI is relatively high among architecture students and academic staff, and there is strong recognition of AI's relevance to the future of architectural education. However, actual usage of AI tools remains low, with nearly half of respondents reporting no use at all. Institutional readiness, including digital infrastructure, staff training, and curriculum flexibility, is consistently rated as inadequate. PCA revealed that institutional capacity, positive attitudes, and ethical concerns are distinct dimensions, meaning that improving one does not automatically improve the others. The major barriers to integration are curriculum rigidity and lack of trained staff, followed by funding constraints and ethical concerns. The study concludes that AI integration in architectural education in South-East Nigeria is presently constrained not by ignorance or resistance alone, but primarily by systemic and institutional weaknesses. Without deliberate investment in infrastructure, faculty development, and curriculum reform, high awareness will not translate into effective adoption.

Based on the findings and discussion, the following recommendations are made:

Curriculum Reform – Architecture programs should revise their curricula to explicitly include AI literacy, generative design tools, and digital workflows. This should be done at both undergraduate and postgraduate levels, with clear learning outcomes.

Staff Capacity Development – Universities should organise regular workshops, short courses, and certification programs to train academic staff in AI applications relevant to architecture. Partnerships with AI-driven design firms and online learning platforms (e.g., Coursera, edX) can supplement internal efforts.

Infrastructure Investment – Institutions should establish digital laboratories, AI-enabled design studios, and reliable high-speed internet access. Government and private sector partnerships could provide funding and hardware donations.

Ethical Framework Development – Each architecture school, in collaboration with professional bodies (e.g., NIA, ARCON), should develop clear guidelines on academic integrity, authorship, responsible AI use, and data privacy. These guidelines should be integrated into student handbooks and course syllables.

Industry–Academia Collaboration – Schools of architecture should create internship and project collaborations with AI-driven architectural firms to provide students with practical exposure and real-world contexts for AI use..

6. COMPETING INTEREST

None to declare

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