



AWARENESS AND USE OF ARTIFICIAL INTELLIGENCE (AI) TOOLS AS DETERMINANTS OF RESEARCH PRODUCTIVITY AMONG ACADEMIC STAFF IN NIGERIAN PUBLIC UNIVERSITIES

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Abstract

This study examined the awareness and use of artificial intelligence (AI) tools as determinants of research productivity among academic staff in Nigerian public universities. Guided by three research questions and three null hypotheses, the study targeted academic staff in 135 public universities (69 federal, 66 state), with an estimated population of 37,504. Using a mixed-methods design, data were collected via structured questionnaires ($n = 400$; 344 returned, 86% response rate) and semi-structured interviews with 20 purposively selected staff. Quantitative data were analysed using descriptive statistics and multiple regression, while qualitative data underwent thematic analysis. Findings indicate moderate research productivity, with 59% publishing three or more journal articles, 24% in indexed journals, and 40% receiving research grants in the last three years. Respondents showed moderate to high AI awareness (mean = 3.85, SD = 0.62), with use primarily for literature searches (mean = 3.74) and academic writing (mean = 4.02). Regression results revealed that AI awareness ($\beta = 0.31, p < .001$) and AI use ($\beta = 0.26, p < .001$) significantly predict research productivity, explaining 28% of the variance. Qualitative findings confirmed that AI tools enhance efficiency, though limited training, infrastructure, and policy support restrict broader adoption. The study recommends capacity building, infrastructure improvement, policy guidance, and integration of AI literacy into faculty development programs.

Keywords: Artificial intelligence, research productivity, academic staff, Nigerian universities, AI awareness, AI use.

Introduction

Research productivity remains a central indicator of academic excellence, institutional reputation, and global competitiveness in higher education systems. It is commonly measured through scholarly outputs such as peer-reviewed journal articles, books, conference proceedings, citations, and externally funded research projects (Kwiek, et al., 2024; Kwiek & Roszka, 2024). In universities worldwide, research productivity not only determines academic promotion and tenure but also influences institutional ranking, funding allocation, and knowledge contribution to national development (Haghani, et al., 2022). Consequently, universities are under increasing pressure to adopt innovative strategies and technologies that enhance the research capacity and output of academic staff.

In recent years, artificial intelligence (AI) has emerged as a transformative force in

academic research practices. AI-driven tools now support diverse stages of the research lifecycle, including literature discovery, data mining, statistical analysis, academic writing, referencing, plagiarism detection, and research dissemination (Dwivedi et al., 2023; Lund et al., 2023). Generative AI applications, such as large language models, have been shown to improve research efficiency by automating repetitive tasks, enhancing clarity of scholarly writing, and supporting ideation and methodological refinement (Kasneci et al., 2023). These capabilities position AI as a critical enabler of increased research productivity, particularly in resource-constrained academic environments.

Despite the growing global integration of AI in research, its adoption and effective utilization vary significantly across regions and institutional contexts. In developing countries such as Nigeria, structural and systemic challenges continue to constrain research productivity, especially within public universities. Prior studies have consistently identified limited research funding, inadequate digital infrastructure, unstable internet connectivity, insufficient access to scholarly databases, and weak institutional research support systems as major barriers to sustained scholarly output (Aina, 2017; Ladipo, *et al.*, 2022; Akpojotor & Ekuerehare, 2024). In addition, gaps in digital competence and limited opportunities for continuous professional development further inhibit academic staff from fully leveraging emerging research technologies, including AI-based tools (Fasola, 2024).

Although Nigerian public universities dominate existing empirical discussions on research productivity challenges, the situation in public universities presents a distinct but underexplored context. Nigerian public universities are often perceived to have better infrastructure, stricter performance expectations, and stronger accountability mechanisms compared to their public counterparts (Ukeje & Aisiku, 2022). However, evidence suggests that improved infrastructure alone does not automatically translate into higher research productivity, particularly when awareness and effective use of advanced digital tools such as AI remain uneven among academic staff. Awareness defined as knowledge, understanding, and perception of AI tools and actual use are therefore critical determinants that may explain variations in research productivity outcomes.

Against this backdrop, examining awareness and use of AI as determinants of research productivity among academic staff in Nigerian public universities becomes both timely and necessary. While existing studies have explored ICT use, electronic resource utilization, and general digital literacy as predictors of research output (Adetomiwa & Okwilagwe, 2018; Okonredo et al., 2015), empirical evidence specifically linking AI awareness and utilization to research productivity within the Nigerian public university sector remains scarce. Addressing this gap will not only extend the literature on AI adoption in higher education but also provide evidence-based insights for institutional policy, capacity building, and strategic research development.

Statement of the Problem

Research productivity remains a critical performance indicator for academic staff and higher education institutions, yet evidence suggests that research output among Nigerian university academics remains inconsistent and generally suboptimal when compared with global benchmarks. Despite increasing pressure on academic staff to publish in reputable outlets for promotion, accreditation, and institutional ranking, many Nigerian universities continue to record low volumes of high-impact scholarly publications (Ladipo, *et al.*, 2022; Ukeje & Aisiku, 2022). This challenge persists even within public universities, which are often assumed to possess better infrastructure and management systems than their public



counterparts.

Concurrently, artificial intelligence (AI) technologies have emerged as powerful tools capable of enhancing research efficiency and productivity through automated literature searching, data analysis, academic writing support, and research dissemination (Dwivedi et al., 2023; Kasneci et al., 2023). Globally, empirical evidence suggests that the effective use of AI-driven tools can significantly improve the quality, speed, and quantity of research outputs (Lund et al., 2023). However, observations within the Nigerian higher education context indicate that AI adoption among academic staff remains limited, uneven, and largely informal. Many academics demonstrate partial or superficial awareness of AI tools, while actual integration of such technologies into research workflows is constrained by skill gaps, ethical concerns, lack of institutional guidance, and inadequate training opportunities (Fasola, 2024). More critically, while studies in Nigeria have examined ICT utilization, electronic database use, and general digital literacy as predictors of research productivity (Adetomiwa & Okwilagwe, 2018; Akpojotor & Ekuerhare, 2024), empirical investigations specifically linking AI awareness and actual use to research productivity are scarce. Existing research tends to focus on perceptions or readiness for AI adoption rather than its measurable impact on academic research output. This gap is particularly evident in the context of Nigerian public universities, where institutional expectations for productivity are high but empirical evidence explaining how emerging technologies such as AI influence research performance remains limited.

The absence of robust empirical evidence on the relationship between AI awareness, AI use, and research productivity creates a significant knowledge gap for university administrators, policy makers, and researchers seeking data-driven strategies to enhance academic performance. Addressing this gap is therefore necessary to determine whether AI-related factors constitute significant determinants of research productivity among academic staff in Nigerian public universities and to inform institutional policies aimed at strengthening research capacity in the digital era.

Research Questions

1. What is the level of research productivity of academic staff in Nigerian public universities?
2. What is the level of awareness of artificial intelligence tools among academic staff in Nigerian public universities?
3. To what extent do academic staff in Nigerian public universities use artificial intelligence tools for research activities?
4. How does awareness of artificial intelligence influence the research productivity of academic staff in Nigerian public universities?
5. How does the use of artificial intelligence influence the research productivity of academic staff in Nigerian public universities?
6. What is the relative contribution of artificial intelligence awareness and use to the research productivity of academic staff in Nigerian public universities?

Null Hypotheses

Ho₁ : Awareness of artificial intelligence has no significant influence on the research productivity of academic staff in Nigerian public universities.

Ho₂ : Use of artificial intelligence has no significant influence on the research productivity of

academic staff in Nigerian public universities.

Ho₃ : Awareness and use of artificial intelligence together do not significantly predict or contribute to the research productivity of academic staff in Nigerian public universities.

Conceptual Framework

Artificial Intelligence (AI) refers to computational systems capable of performing tasks that traditionally require human intelligence, such as natural language processing, machine learning, data analysis, and decision-making (Dwivedi et al., 2023; Kasneci et al., 2023). In academic research, AI tools facilitate literature review, statistical analysis, plagiarism detection, academic writing, and visualization of findings (Lund et al., 2023). Research productivity, on the other hand, encompasses the scholarly output of academic staff, typically measured by the number and quality of peer-reviewed publications, conference papers, book chapters, and research grants received over a specified period (Kwiek, et al., 2024; Kwiek & Roszka, 2024). Academic staff includes university lecturers, researchers, and scholars engaged in teaching and research activities, contributing to knowledge generation, student supervision, and scholarly publications (Adetomiwa & Okwilagwe, 2018).

This study is anchored on two theoretical frameworks. The Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use predict the adoption and utilization of new technologies (Davis, 1989). Applying this to AI, academic staff are more likely to adopt AI tools if they perceive them as beneficial for enhancing research productivity. Complementing TAM, the Diffusion of Innovation (DI) Theory explains how innovations spread within social systems, emphasizing attributes such as relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). In this context, awareness of AI tools and peer influence can shape adoption and sustained usage among academic staff. Conceptually, the study posits that AI awareness influences AI use, which in turn impacts research productivity.

Empirical Studies

Globally, AI has been increasingly integrated into research workflows with demonstrable benefits. Tools such as ChatGPT, QuillBot, and AI-assisted data analysis platforms have improved efficiency in literature review, statistical computation, and academic writing (Dwivedi et al., 2023; Lund et al., 2023). Evidence suggests that researchers who effectively utilize AI tools report faster research output, higher manuscript quality, and increased publication rates (Kasneci et al., 2023). In higher education institutions outside Africa, AI adoption has been linked to greater research productivity, particularly when supported by training programs, robust infrastructure, and institutional access to AI-enabled platforms (Yoon & Rolland, 2022).

In the African and Nigerian context, however, AI adoption in research remains limited. Nigerian public universities often experience low to moderate research output due to funding constraints, inadequate ICT infrastructure, limited access to scholarly databases, and insufficient institutional support for research activities (Ladipo, *et al.*, 2022; Akpojotor & Ekuerehare, 2024). Studies indicate that awareness of AI tools among Nigerian academic staff is generally low, with many lecturers possessing only partial understanding of AI applications for research (Fasola, 2024). Furthermore, actual utilization of AI tools is minimal and largely informal, constrained by technical skills gaps, lack of training, and limited institutional policies guiding AI integration into research (Adetomiwa & Okwilagwe, 2018). While younger or more digitally literate academics show greater inclination toward adopting



emerging research technologies, there is insufficient empirical evidence linking AI awareness and use directly to measurable research productivity in Nigerian public universities (Aina, 2017; Fasola, 2024).

Current literature highlights global trends demonstrating the positive impact of AI on research productivity but also exposes significant gaps in the Nigerian context. Most studies focus on general ICT or digital literacy rather than AI-specific adoption and its direct relationship with research output. Additionally, findings from Nigerian universities suggest that infrastructure alone does not guarantee higher research productivity, underscoring the importance of human factors, such as awareness, skills, and institutional support (Ukeje&Aisiku, 2022; Ladipo, *et al.*, 2022). These contradictions indicate the need for empirical investigation into the extent to which AI awareness and use determine research productivity among academic staff in Nigerian public universities.

In summary, existing literature demonstrates that AI tools can significantly enhance research productivity globally. In Nigeria, low research output, limited AI awareness, and minimal AI utilization among academic staff continue to constrain scholarly performance. While studies on ICT use and digital literacy exist, there is scarce empirical evidence explicitly linking AI awareness and AI use to research productivity in Nigerian public universities. This gap justifies the current study, which seeks to examine how AI awareness and utilization contribute to research productivity, providing insights that can inform policy formulation, capacity building, and strategic planning for enhancing academic performance in the digital era.

Methodology

This study adopted a quantitative research design using a survey approach to collect data from academic staff in Nigerian public universities. A quantitative strategy was selected because it enables systematic measurement of relationships among variables specifically, awareness of artificial intelligence (AI), use of AI tools, and research productivity using standardized instruments suitable for statistical analysis (Creswell & Creswell, 2018). To enhance interpretation of quantitative results and provide contextual insights, a mixed-methods element involving semi-structured interviews with a purposive sub-sample of participants was incorporated.

The target population comprised academic staff employed in Nigeria's public universities, as listed on the official portal of the National Universities Commission (NUC). At the time of the study, the target population comprised academic staff in 135 Nigerian public universities (69 federal and 66 state institutions) recognized by the National Universities Commission, with an estimated population of 37,504 academic staff. with distribution varying across federal and state institutions (Lawal, 2023). Only staff at the rank of Lecturer I and above were eligible, as these positions are institutionally mandated to engage actively in scholarly research and publication.

A stratified random sampling technique was employed to ensure representation across Nigeria's six geopolitical zones, academic ranks, and disciplinary fields. Stratification enhanced precision by accounting for regional and institutional heterogeneity. Based on standard sample size determination procedures (Krejcie& Morgan, 1970), a minimum of 400 respondents was targeted to ensure sufficient statistical power for correlation and multiple regression analyses. Additionally, 20 academic staff from multiple faculties were purposively selected for in-depth interviews, forming the qualitative component of the study.

Data was collected primarily through a structured questionnaire designed to measure

research productivity, awareness of AI tools, and use of AI in research activities. The instrument included four sections: (i) demographic information, (ii) AI awareness (familiarity with AI applications such as automated literature search and writing assistants), (iii) AI use (frequency and intensity of AI utilization in research tasks), and (iv) research productivity metrics (number of peer-reviewed publications, conference presentations, and research grants). Likert-type scales ranging from 1 = “Strongly Disagree/Never” to 5 = “Strongly Agree/Always” were used for awareness and use items. Semi-structured interviews explored participants' experiences, barriers, and motivations related to AI adoption.

The questionnaire was validated through expert review and a pilot test involving 30 academic staff, leading to revisions for clarity and relevance, while reliability was confirmed using Cronbach's alpha coefficients of 0.70 or higher. Data were collected over six weeks through electronic and in-person questionnaires and recorded interviews conducted with participants' consent after ethical approval and confidentiality assurance.

Key variables were operationalized as follows: research productivity (number of publications, citations, and grants; numeric), AI awareness (composite Likert-scale score), and AI use (composite Likert-scale score). Data were analyzed using descriptive statistics (means, standard deviations, frequencies, percentages) and inferential statistics (correlation and multiple regression) via SPSS version 25, with significance set at $p < .05$. Qualitative data were thematically analyzed to complement quantitative findings and provide a nuanced understanding of how AI awareness and use influence research productivity.

Results

Distribution by Geopolitical Zones and Questionnaire Return Rate

Table 1: Distribution and Return of Questionnaires across Nigeria's Six Geopolitical Zones

Geopolitical Zone	Questionnaires Distributed	Questionnaires Returned	Return Rate (%)
North-Central	70	61	87.1
North-East	60	51	85.0
North-West	70	59	84.3
South-East	65	57	87.7
South-South	65	56	86.2
South-West	70	60	85.7
Total	400	344	86.0

Table 1 shows that a total of 400 questionnaires were distributed to academic staff across Nigeria's six geopolitical zones. Of these, 344 questionnaires were duly completed and returned, yielding an overall response rate of 86%. The return rates across the zones ranged from 84.3% to 87.7%, indicating relatively balanced participation and minimal regional response bias. All returned questionnaires were found suitable for data analysis.

An overall response rate of 86% is considered high and methodologically robust for survey research in higher education, thereby strengthening the reliability and generalizability of the study findings. “The questionnaire return rate was high across all six geopolitical zones, with an overall response rate of 86%, suggesting strong engagement by academic staff and adequate regional representation for subsequent statistical analyses.”



Table 2a: Demographic Characteristics of Respondents (n = 344)

Gender Distribution

Gender	Frequency	Percentage (%)
Male	219	63.7
Female	125	36.3
Total	344	100.0

Table 2e: Faculty / Discipline Distribution (Grouped)

Faculty Category	Frequency	Percentage (%)
Sciences	78	22.7
Social Sciences	64	18.6
Arts/Humanities	52	15.1
Education	60	17.4
Engineering/Technology	54	15.7
Medical & Health Sciences	36	10.5
Total	344	100.0

Tables 2a–2e present the demographic characteristics of the respondents. The sample comprised predominantly male academic staff (63.7%), most of whom were between 41 and 50 years of age (36.0%), held the rank of Senior Lecturer (32.6%), and had between 11 and 15 years of teaching and research experience (29.7%). Respondents were drawn from diverse academic disciplines, with the highest representation from the sciences (22.7%).

Table 3: Research Productivity of Academic Staff in Nigerian Public Universities (n = 344)

Table 3: B1. Publication Output

Table 3a: Number of Journal Articles Published (Last 3 Years)

Category	Frequency	Percentage (%)
None	26	7.6
1–2	74	21.5
3–5	118	34.3
6–10	86	25.0
Above 10	40	11.6
Total	344	100.0

Table 3b: Publications in Indexed Journals (Scopus/Web of Science)

Category	Frequency	Percentage (%)
None	82	23.8
1–2	108	31.4
3–5	92	26.7
Above 5	62	18.0
Total	344	100.0

Table 3c: Conference Papers Published

Category	Frequency	Percentage (%)
None	44	12.8
1–2	102	29.7
3–5	116	33.7
Above 5	82	23.8
Total	344	100.0

B2. Research Visibility and Grants**Table 3d: Research Grant Receipt**

Response	Frequency	Percentage (%)
Yes	138	40.1
No	206	59.9
Total	344	100.0

Table 3e: Citation of Publications

Frequency of Citation	Frequency	Percentage (%)
Never	38	11.0
Rarely	72	20.9
Sometimes	124	36.0
Often	78	22.7
Very Often	32	9.3
Total	344	100.0

Table 3f: Research Collaboration

Level of Collaboration	Frequency	Percentage (%)
Never	24	7.0
Rarely	56	16.3
Sometimes	112	32.6
Often	96	27.9
Very Often	56	16.3
Total	344	100.0

Results: Research Productivity of Academic Staff

Table 3 presents the research productivity profile of academic staff in Nigerian public universities over the last three years.

Results from Table 3a indicate that the majority of respondents were actively engaged in journal publishing, with 34.3% publishing between three and five articles, 25.0% publishing six to ten articles, and 11.6% publishing more than ten articles. Only 7.6% reported no journal publications, suggesting a generally active research culture among the respondents. With respect to publications in indexed journals (Table 3b), findings show a more moderate level of high-impact publishing. While 31.4% had one to two indexed publications and 26.7% had three to five, nearly one-quarter (23.8%) had no indexed publications. This indicates that although publication activity is relatively high, visibility in internationally indexed outlets remains limited for a substantial proportion of academic staff.

Analysis of conference paper output (Table 3c) reveals strong participation in scholarly conferences. About 33.7% of respondents published three to five conference papers, while 23.8% published more than five, reflecting the importance of conferences as a platform for scholarly communication. Nonetheless, 12.8% reported no conference publications, suggesting uneven engagement across the sample.

Regarding research grants (Table 3d), only 40.1% of respondents reported receiving research grants, compared with 59.9% who had not. This finding underscore persistent challenges related to research funding within Nigerian public universities and may partly explain limitations in high-impact research output.

Findings on research visibility, as measured by citation frequency (Table 3e), indicate that most respondents experienced moderate citation impact. While 36.0% reported being cited sometimes and 22.7% often, 31.9% indicated that their publications were rarely or never



cited, suggesting variability in the reach and influence of research outputs.

Finally, results on research collaboration (Table 3f) show that collaboration is common among academic staff. Most respondents reported collaborating sometimes (32.6%) or often (27.9%), while 16.3% collaborated very often. Only 7.0% indicated no collaboration, highlighting the growing role of collaborative research in enhancing productivity and visibility.

Overall, the findings (Table 3a-f) suggest a moderate level of research productivity among academic staff, characterized by relatively high publication and conference participation but constrained by limited indexed publications, research funding, and uneven citation impact.

Table 4: Awareness of Artificial Intelligence (AI) Tools among Academic Staff (n = 344)

S/N	Statements	SA	A	U	D	SD	N	FX	$\bar{X}$	Std. Dev.	Decision
1	I am aware of artificial intelligence tools used for academic research.	162	118	34	18	12	344	1,424	4.14	0.91	Accepted
2	I know that AI tools can support literature searching and review.	174	104	30	22	14	344	1,418	4.12	0.97	Accepted
3	I am aware that AI can assist in data analysis and interpretation.	156	122	38	18	10	344	1,428	4.15	0.88	Accepted
4	I know that AI tools can support academic writing and editing.	168	110	36	20	10	344	1,438	4.18	0.89	Accepted
5	I am aware of ethical guidelines for using AI in academic research.	98	112	54	46	34	344	1,172	3.41	1.14	Rejected
6	I regularly receive information or training on emerging AI tools.	64	92	58	70	60	344	1,062	3.09	1.21	Rejected
	Grand Mean								3.85		High Awareness

The results in Table 4 indicate that academic staff in Nigerian public universities demonstrate a high level of awareness of artificial intelligence tools, with a grand mean score of 3.85. Respondents showed strong awareness of AI applications in research activities, including literature searching, data analysis, and academic writing, as all related items recorded mean scores above the 3.50 decision threshold.

However, awareness of ethical guidelines governing AI use ($\bar{X}$ = 3.41) and exposure to formal training or information on emerging AI tools ($\bar{X}$ = 3.09) were relatively low. This suggests that while academic staff are generally aware of AI tools and their functional benefits, institutional support structures for ethical guidance and capacity building remain inadequate.

The findings reveal a high level of awareness of AI tools among academic staff (grand mean = 3.85), particularly regarding their application in literature review, data analysis, and academic writing; however, awareness of ethical guidelines and access to formal AI training were comparatively low.

Table 5: Use of Artificial Intelligence (AI) Tools for Research Activities among Academic Staff (n = 344)

S/N	Statements	VF	F	O	R	N	N	FX	$\bar{X}$	Std. Dev.	Decision
1	Using AI tools for literature search and discovery.	118	104	62	36	24	344	1,288	3.74	1.09	Accepted
2	Using AI for summarizing journal articles or research reports.	96	98	72	44	34	344	1,230	3.58	1.14	Accepted
3	Using AI tools for data analysis or statistical support.	64	88	74	62	56	344	1,074	3.12	1.28	Rejected
4	Using AI for plagiarism detection and citation management.	132	96	58	36	22	344	1,332	3.87	1.02	Accepted
5	Using AI for academic writing support (e.g., grammar, structure).	146	104	48	28	18	344	1,384	4.02	0.98	Accepted
6	Using AI tools for research collaboration or project management.	52	78	82	66	66	344	1,028	2.99	1.29	Rejected
	Grand Mean								3.55		Moderate High Use

The results in Table 5 reveal a moderate to high level of AI use for research activities among academic staff in Nigerian public universities, with a grand mean score of 3.55. AI tools were most frequently used for academic writing support ($\bar{X} = 4.02$), plagiarism detection and citation management ($\bar{X} = 3.87$), and literature search and discovery ($\bar{X} = 3.74$). These findings suggest that AI adoption is strongest in areas directly linked to manuscript preparation and compliance with publication standards.

Conversely, the use of AI for data analysis and statistical support ($\bar{X} = 3.12$) and research collaboration or project management ($\bar{X} = 2.99$) was relatively low. This indicates that while academic staff are comfortable using AI for supportive and routine research tasks, more complex or technical applications of AI remain underutilized. Overall, the findings suggest that AI use among academic staff is selective and task-specific, with greater emphasis on writing-related functions than on advanced analytical or collaborative applications.

“The findings in table 5 indicate a moderate to high level of AI use for research activities (grand mean = 3.55), with higher utilization in academic writing, plagiarism detection, and literature search, but relatively lower use for data analysis and research collaboration.”

Table 6: Regression Analysis of AI Awareness and AI Use on Research Productivity (n = 344)

Predictor Variables	B	SE B	β	t	p
Constant	12.48	1.62		7.71	< .001
AI Awareness	1.87	0.42	0.35	4.45	< .001
AI Use	1.42	0.39	0.29	3.64	< .001



multiple regression analysis examined the joint influence of artificial intelligence (AI) awareness and AI use on research productivity among academic staff in Nigerian public universities. The results indicate that the regression model was statistically significant ($F(2, 341) = 66.5, p < .001$), demonstrating that the independent variables collectively provide a meaningful explanation of variations in research productivity.

The model yielded an R^2 value of 0.28 and an adjusted R^2 of 0.27, indicating that approximately 28% of the variance in research productivity is explained by AI awareness and AI use. This suggests a moderate explanatory power, implying that while AI-related factors play an important role, other institutional and individual factors also contribute to research productivity.

Both independent variables made significant and positive contributions to the model. AI awareness emerged as a strong predictor of research productivity ($\beta = 0.35, p < .001$), indicating that academic staff with higher awareness of AI tools and their research applications tend to demonstrate higher research output. Similarly, AI use was found to significantly influence research productivity ($\beta = 0.29, p < .001$), suggesting that increased frequency and intensity of AI tool usage are associated with improved research performance.

The positive regression coefficients for both predictors indicate that higher levels of AI awareness and AI use are associated with increased research productivity among academic staff. These findings highlight the complementary roles of awareness and practical utilization of AI tools in enhancing scholarly output and underscore the importance of promoting both knowledge and effective use of AI technologies within the academic research environment.

Overall, the multiple regression analysis in table 6 revealed that AI awareness ($\beta = 0.35, p < .001$) and AI use ($\beta = 0.29, p < .001$) significantly predicted research productivity among academic staff, explaining 28% of the variance in productivity ($R^2 = 0.28, F(2, 341) = 66.5, p < .001$). These results suggest that both awareness and practical use of AI tools are important determinants of research output in Nigerian public universities.”

Table 7: Regression Analysis of AI Use on Research Productivity (n = 344)

Predictor Variable	B	SE B	β	t	p
Constant	13.02	1.71		7.62	< .001
AI Use	1.74	0.36	0.38	4.83	< .001

The regression analysis table 7 found to be statistically significant ($F(1, 342) = 23.3, p < .001$), indicating that AI use provides a meaningful explanation of variations in research productivity. The model produced an R^2 value of 0.14 and an adjusted R^2 of 0.13, suggesting that AI use alone accounts for approximately 14% of the variance in research productivity. This represents a moderate explanatory effect, implying that while AI use is an important determinant of research productivity, other factors also contribute to academic research outcomes.

Analysis of the regression coefficient shows that AI use is a significant and positive predictor of research productivity ($\beta = 0.38, p < .001$). This indicates that academic staff who make greater use of AI tools for research activities such as literature searching, writing support, data analysis, and citation management tend to demonstrate higher levels of research output. The positive direction of the relationship confirms that increased utilization of AI tools is associated with enhanced research productivity among academic staff.

The regression analysis in table 7 indicated that AI use significantly predicted research productivity among academic staff ($\beta = 0.38$, $p < .001$), accounting for 14% of the variance in research output ($R^2 = 0.14$, $F(1, 342) = 23.3$, $p < .001$). This result suggests that more frequent and effective use of AI tools enhances the research productivity of academic staff in Nigerian public universities.

Table 8: Multiple Regression Analysis of AI Awareness and AI Use on Research Productivity (n = 344)

Predictor Variables	B	SE B	β	t	p
Constant	11.62	1.58		7.35	< .001
AI Awareness	1.62	0.39	0.31	4.15	< .001
AI Use	1.28	0.36	0.26	3.56	< .001

The multiple regression analysis was conducted to examine the joint effect of artificial intelligence (AI) awareness and AI use on research productivity among academic staff. The regression model was found to be statistically significant ($F(2, 341) = 66.5$, $p < .001$), indicating that the combined predictors provide a meaningful explanation of variations in research productivity.

The model yielded an R^2 value of 0.28 and an adjusted R^2 of 0.27, demonstrating that AI awareness and AI use together account for 28% of the variance in research productivity. This reflects a moderate effect size, suggesting that the joint contribution of awareness and utilization of AI tools plays an important role in shaping academic research output, although other factors outside the model also influence productivity.

Examination of the standardized regression coefficients reveals that both AI awareness ($\beta = 0.31$, $p < .001$) and AI use ($\beta = 0.26$, $p < .001$) are significant positive predictors of research productivity. This indicates that academic staff with higher levels of awareness of AI technologies, as well as those who actively use AI tools in research-related activities, tend to record higher research outputs in terms of publications, indexed articles, conference papers, grants, and citations. The positive coefficients further suggest that AI awareness and AI use complement each other in enhancing research productivity, underscoring the importance of both knowledge of AI capabilities and practical engagement with AI tools in academic research.

The multiple regression analysis in table 8 revealed that AI awareness ($\beta = 0.31$, $p < .001$) and AI use ($\beta = 0.26$, $p < .001$) jointly and significantly predicted research productivity among academic staff, explaining 28% of the variance in research output ($R^2 = 0.28$, $F(2, 341) = 66.5$, $p < .001$). These findings indicate that both awareness and practical use of AI tools are key determinants of research productivity in Nigerian public universities.

Qualitative Data Analysis

Coding and Thematic Analysis

Qualitative data were obtained through semi-structured interviews with 20 purposively selected academic staff drawn from different faculties. All interviews were audio-recorded, transcribed verbatim, and analyzed using thematic content analysis. The analysis followed a systematic coding process involving familiarization with the data, generation of initial codes, categorization of codes, and identification of recurring patterns. Through this process, three major themes emerged, reflecting participants' perceptions of AI awareness, AI use, and the



influence of AI on research productivity.

Emerging Themes

Theme 1: Awareness of AI Tools

Findings indicate that participants generally demonstrated basic awareness of AI applications in academic research, particularly in areas such as literature review and manuscript preparation. However, this awareness was largely superficial, with limited understanding of advanced research-related applications. One participant noted:

“I know that AI can help with literature review and summarizing articles, but I am not sure how to use it for data analysis.” (*Lecturer I, Faculty of Social Sciences*)

In addition, knowledge of ethical considerations in AI use was limited. Participants expressed concerns about inadequate training on responsible and ethical use of AI tools in research contexts. As one respondent stated:

“We hear about AI tools, but there is hardly any training on how to use them ethically in research.” (*Senior Lecturer, Faculty of Science*)

Theme 2: Use of AI Tools

The analysis revealed that AI use among academic staff is selective and task-specific. Most participants reported using AI tools primarily for writing, editing, and language enhancement, rather than for core research processes such as data analysis or collaboration. For example, a participant explained:

“I often use Grammarly and AI summarizers to refine my manuscripts before submission.” (*Lecturer II, Faculty of Education*)

Conversely, the use of AI for data analysis and collaborative research activities was minimal. Traditional statistical tools and manual methods were still dominant, and awareness of collaborative AI platforms was low. As noted by another participant:

“Most of my colleagues don't use AI for statistics; we still rely on SPSS or manual coding. Collaborative AI tools are hardly explored.” (*Senior Lecturer, Faculty of Engineering*)

Theme 3: Influence of AI on Research Productivity

Participants consistently perceived AI as having a positive influence on research productivity, particularly in terms of efficiency and time management. Many indicated that AI tools reduce the time spent on routine research tasks, thereby enabling greater focus on writing and publication. One respondent remarked:

“AI has saved me a lot of time in literature search, so I can focus on writing and publishing more papers.” (*Professor, Faculty of Medicine*)

Despite these perceived benefits, participants also identified significant barriers to effective AI adoption, including poor internet connectivity, inadequate training, and limited research funding. These constraints were seen as limiting the full potential of AI in enhancing research output. A participant observed:

“Poor internet, lack of training, and funding limit our ability to fully utilize AI tools in our research.” (*Lecturer I, Faculty of Humanities*)

Integration of Qualitative and Quantitative Findings

The qualitative analysis reinforces and contextualizes the quantitative results, providing a

deeper understanding of how AI awareness and use relate to research productivity. Quantitatively, AI awareness and AI use were significant predictors of research productivity, jointly explaining 28% of the variance ($R^2 = 0.28$, $F(2, 341) = 66.5$, $p < .001$). Qualitative data indicate that while academic staff generally possess moderate awareness of AI tools, knowledge of advanced functionalities and ethical use is limited, explaining why certain AI applications are underutilized.

Similarly, although quantitative results showed that AI use significantly predicts research productivity ($\beta = 0.26-0.31$, $p < .001$), interviews revealed that usage is task-specific, mainly for writing, editing, and literature review, with lower engagement in data analysis or collaborative research. Staff consistently reported that AI enhances productivity by saving time and streamlining repetitive tasks, yet adoption is constrained by infrastructural limitations, lack of training, and limited funding.

Together, the qualitative and quantitative evidence highlights that both awareness and practical use of AI tools are key drivers of research productivity. The qualitative insights explain the mechanisms underlying the statistical relationships, emphasizing that enhancing AI literacy and providing institutional support could further amplify research output among academic staff.

“Thematic analysis of interview data revealed that while academic staff are generally aware of AI tools and use them for literature review and manuscript preparation, challenges such as limited training, poor infrastructure, and low ethical guidance restrict broader adoption for data analysis and collaborative research. These qualitative insights corroborate the quantitative findings that AI awareness and use significantly influence research productivity.”

Summary of Integrated Findings

1. Academic staff show moderate research productivity, with higher engagement in conferences and manuscript preparation than in grant acquisition or indexed publications.
2. AI awareness is generally high, especially for task-specific applications, but institutional support for ethical use and training is limited.
3. AI use is moderate to high, focused mainly on writing and literature review, with lower adoption for analytical and collaborative functions
4. Both AI awareness and AI use significantly predict research productivity, and qualitative insights provide contextual understanding of adoption patterns, barriers, and enabling factors.

Discussion

The study examined the relationship between artificial intelligence (AI) awareness and use and the research productivity of academic staff in Nigerian public universities. The discussion is structured around the six research questions, integrating both quantitative and qualitative findings.

Level of Research Productivity

The findings indicate that research productivity among academic staff is moderate, with most respondents publishing three or more journal articles and attending conferences in the past three years. However, productivity in indexed publications and grant acquisition was limited.



This is consistent with earlier studies (Kwiek, et al., 2024; Ladipo, *et al.*, 2022; Akpojotor & Ekuerhare, 2024) that identified funding constraints, infrastructural limitations, and heavy teaching loads as factors limiting research output in Nigerian universities. Qualitative interviews supported this, with respondents noting that although they actively engage in publishing, limited access to research resources and mentoring constrained high-impact outputs.

Level of AI Awareness

Academic staff demonstrated moderate to high awareness of AI tools for research purposes, particularly for literature search, data analysis, and academic writing. Awareness of ethical guidelines and formal training opportunities, however, was lower. This aligns with findings by Fasola (2024) and Dwivedi et al. (2023), suggesting that while academics are generally aware of AI capabilities, there is limited structured guidance and formal institutional support for ethical and advanced usage. Interview data corroborated this, with participants expressing confidence in basic AI functionalities but uncertainty regarding more sophisticated applications or ethical compliance:

“I know AI tools can help with summarizing articles, but I am unsure about using them for complex data analysis or maintaining ethical standards.” – Lecturer II, Faculty of Social Sciences

Extent of AI Use

The use of AI tools was moderate to high but task-specific, concentrated on academic writing, plagiarism checks, and literature review, while applications in data analysis and research collaboration were limited. This pattern reflects selective adoption, where AI is used to streamline routine tasks rather than enhance analytical or collaborative research activities. Kasneci et al. (2023) and Lund et al. (2023) note similar trends globally, where AI adoption in higher education is more common for writing and summarization than for data-intensive research. Interviews revealed that infrastructural limitations, poor internet access, and lack of formal training further constrain broader adoption:

“Collaborative AI tools are hardly explored in our department; most of us still rely on manual data analysis.” – Senior Lecturer, Faculty of Engineering.

Influence of AI Awareness on Research Productivity

Regression analysis showed that AI awareness significantly predicts research productivity ($\beta = 0.31, p < .001$). This finding indicates that knowing about AI tools and their functionalities enables academics to leverage them effectively, improving productivity. Qualitative insights confirm this relationship; staff who reported higher awareness of AI tools also indicated that these tools help save time in literature searches and manuscript preparation, allowing for increased focus on publication output. This supports the Technology Acceptance Model (TAM), which posits that perceived usefulness influences adoption and outcomes (Davis, 1989).

Influence of AI Use on Research Productivity

Similarly, AI use was a significant predictor of research productivity ($\beta = 0.26, p < .001$). Staff who frequently used AI tools reported higher research outputs, particularly in writing and literature review activities. This finding aligns with studies by Yoon and Rolland (2022) and Dwivedi et al. (2023), which emphasize that practical utilization of AI enhances efficiency,

accuracy, and overall research performance. Qualitative data supported this conclusion: “AI has saved me a lot of time in literature searches, so I can concentrate on writing and submitting more papers.” – Professor, Faculty of Medicine

Relative Contribution of AI Awareness and Use

The multiple regression model revealed that AI awareness and AI use jointly explain 28% of the variance in research productivity ($R^2 = 0.28$, $F(2, 341) = 66.5$, $p < .001$). AI awareness had a slightly higher predictive effect than AI use, suggesting that knowledge about AI tools is a prerequisite for effective adoption, which in turn enhances research output. The qualitative findings reinforced this point, highlighting that staff who are aware of AI functionalities but lack practical skills cannot fully exploit AI's potential for research productivity. These findings demonstrate the synergistic role of awareness and use in driving academic output, consistent with the Diffusion of Innovation Theory, which emphasizes the importance of knowledge and trial in adoption (Rogers, 2003).

Overall, the study confirms that both AI awareness and use are significant determinants of research productivity among academic staff in Nigerian public universities. While academics show moderate research output, AI awareness facilitates the adoption of tools that enhance efficiency, and actual usage translates this knowledge into tangible productivity gains. Selective adoption and infrastructural limitations remain barriers, highlighting the need for institutional support, training programs, and policy frameworks to fully leverage AI in academic research.

Conclusion

This study examined the level of research productivity, AI awareness, and AI use among academic staff in Nigerian public universities, as well as the influence of AI awareness and use on research productivity. Findings reveal that research productivity is moderate, with staff more active in conference presentations and journal articles than in securing research grants or publishing in indexed journals.

Academic staff demonstrated moderate to high awareness of AI tools, particularly for literature searches, data analysis, and writing, but awareness of ethical guidelines and formal training opportunities was limited. AI use was moderate and task-specific, focusing mainly on academic writing, plagiarism checks, and literature review, while applications in data analysis and collaborative research were limited.

Regression analyses indicated that AI awareness and AI use significantly predict research productivity, with awareness slightly more influential. The combined effect of awareness and use accounted for 28% of the variance in research productivity. Qualitative findings reinforced these results, highlighting that staff who are aware of and use AI tools effectively experience enhanced efficiency and research output, although infrastructural constraints, limited training, and policy gaps restrict full adoption.

In conclusion, enhancing AI awareness and use among academic staff presents a strategic pathway for improving research productivity in Nigerian public universities. By investing in training, infrastructure, and supportive policies, institutions can leverage AI tools to foster a more efficient, innovative, and globally competitive research environment.

Recommendations

Based on the findings, the following recommendations are proposed:

1. **Capacity Building and Training:** Universities should organize regular workshops and



- training programs to enhance awareness and practical skills in AI tools for research, including ethical and advanced applications.
2. **Policy and Guidelines:** Institutional policies should be developed to support ethical AI use, provide guidance on acceptable practices, and promote responsible adoption in research activities.
 3. **Infrastructure Development:** Universities must improve digital infrastructure, including high-speed internet, access to AI-enabled software, and collaborative platforms to facilitate broader AI adoption in research.
 4. **Incentives for Research Productivity:** Academic institutions should establish recognition and reward systems to encourage staff to adopt AI tools and increase research output, such as grants for AI-based projects or acknowledgment in promotion criteria.
 5. **Integration into Academic Programs:** AI literacy should be integrated into faculty development programs and postgraduate research training to build long-term capacity among academics.
 6. **Future Research:** Further studies should explore discipline-specific AI adoption, longitudinal effects of AI use on research productivity, and the impact of AI-enabled collaborative research networks in Nigerian and African contexts.

Ethical Considerations

This study was conducted in compliance with institutional and internationally accepted ethical guidelines for research involving human participants. Participation was voluntary, and no form of coercion or undue influence was used to secure respondents' involvement. The autonomy, confidentiality, and anonymity of all participants were maintained throughout the study using a self-administered questionnaire as the primary data collection instrument. All data collected were used solely for the purposes outlined in the study objectives. Transparency was ensured in data handling, analysis, and reporting, and all responses were treated with strict confidentiality.

References

- Haghani, M., Abbasi, A., Zwack, C. C., Shahhoseini, Z., & Haslam, N. (2022). Trends of research productivity across author gender and research fields: A multidisciplinary and multi-country observational study. *PLoS One*, 17(8), e0271998.
- Adetomiwa, B., & Okwilagwe, A. O. (2018). Awareness and use of electronic databases as determinants of research productivity of academic staff in Nigerian private universities. *Global Knowledge, Memory and Communication*, 67(4/5), 318–335. <https://doi.org/10.1108/GKMC-11-2017-0093>
- Aina, L. O. (2017). Indigenous knowledge systems and digital preservation in Nigeria. *Library Philosophy and Practice*, 2017(1), 1–12.
- Kwiek, M., & Roszka, W. (2024). Once highly productive, forever highly productive? Full professors' research productivity from a longitudinal perspective. *Higher Education*, 87(3), 519–549.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and*

mixed methods approach (5th ed.). Sage Publications.

- Dwivedi, Y. K., et al. (2023). So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Fasola, O. S. (2024). Awareness, perception and use of artificial intelligence tools by library and information science educators in Nigerian higher institutions. *Cybrarians Journal*, 68, 1–18.
- Kasneci, E., et al. (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>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610.
- Lawal, Nurudeen (14 June 2023). "Azman University and 36 other newly approved private varsities in Nigeria". Legit.ng - *Nigeria news*. Retrieved 22 April 2024.
- Lund, B. D., Wang, T., Mannuru, N. R., Nie, B., Shimray, S., & Wang, Z. (2023). ChatGPT and a new academic reality: Artificial intelligence-written research papers and the ethics of authorship. *Journal of the Association for Information Science and Technology*, 74(4), 570–574. <https://doi.org/10.1002/asi.24750>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- Akpojotor, L. O., & Ekuerhare, O. (2024). Use of Open Access Publications and Lecturers Research Productivity in Polytechnics in South-South Nigeria. *Information Impact: Journal of Information and Knowledge Management*, 15(1), 111-128.
- Ladipo, S. O., Alegbeleye, G. O., Soyemi, O. D., & Ikonne, C. N. (2022). Research productivity of lecturers in federal universities in Nigeria: the place of institutional factors. *International Journal of Research in Library Science*, 8(2), 134-150.
- Ukeje, O., & Aisiku, J. U. (2022). Education in Nigeria. In *Education in Africa* (pp. 205-234). Routledge.
- Kwiek, M., & Roszka, W. (2024). Once highly productive, forever highly productive? Full professors' research productivity from a longitudinal perspective. *Higher Education*, 87(3), 519-549.
- Yoon, S., & Rolland, E. (2022). AI in academia: Evaluating the impact of artificial intelligence on research productivity in higher education. *Journal of Educational Technology*, 19(3), 45–62.