Artificial Intelligence Use and Library Engagement among Undergraduates in State Universities in Southwest Nigeria: A Correlational Study

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ABSTRACT

The study examined the relationship between the use of Artificial Intelligence and library engagement among undergraduates in universities in Southwest Nigeria. The study adopted a correlational survey design, using a structured questionnaire administered to 2,894 students selected through a multistage stratified random sampling technique. Data was analysed using descriptive and inferential statistics. Findings revealed that students extensively use AI tools for writing, research, and study assistance. However, engagement with university libraries remains moderate, with limited participation in instructional programs and consultations with librarians. A significant negative relationship was found between AI use and library engagement ($r = -0.428$, $p < .05$), implying that higher AI use reduces reliance on library resources ($t = 5.214$, $df = 2,892$, $p < .05$). This study concludes that although AI technologies enhance students' access to information and academic productivity, they also challenge the conventional roles of libraries in the learning process. It recommends integrating AI-driven solutions into library operations and services, promoting digital literacy and fostering faculty-library collaboration to sustain engagement in an AI-mediated learning environment.

KEYWORDS

- Academic libraries
- Artificial intelligence
- Digital transformation
- Information-seeking behaviour
- Library engagement
- Library use
- Technology adoption

Introduction

Across universities today, a quiet but profound shift is occurring in how students seek and use information. The traditional picture of students trooping to the library for research materials is fading, replaced by quick interactions with Artificial Intelligence (AI) tools that provide instant answers and summaries. Tools like ChatGPT, Grammarly and Google Bard have become new "study partners," helping students write essays, find references and solve assignments in seconds (Ojo, 2024; Vieriu and Petrea 2025; Klimova and Pikhart, 2025). While these technologies undoubtedly enhance convenience, they also threaten to erode students' dependence on academic libraries, the very institutions built to cultivate deep, critical and ethical information use (Zondi et al., 2024). This growing preference for AI over library resources raises serious questions about the future role of university libraries in supporting learning and scholarship.

University libraries have historically been the intellectual backbone of academic life, providing access to curated collections, research guidance and spaces for learning. However, recent developments suggest that libraries are losing ground to digital technologies that promise speed and automation. Several studies have noted declining library patronage among undergraduates and identified infrastructure, staffing and policy gaps as factors that hinder libraries from responding effectively to AI-driven change (Adejo and Misau, 2021; Igbo, Imo and Jidere, 2024). Students who once relied on library databases and physical collections now obtain similar information through AI-assisted systems that may not guarantee accuracy or credibility (Klimova and Pikhart, 2025). This behavioural shift presents not just a technological challenge but also a pedagogical one: how can libraries remain relevant in a world where information is instantly generated rather than carefully searched?

Although scholarship has explored AI adoption and library readiness independently, few studies in Nigeria have examined how students' use of AI tools relates to their engagement with library services (Ojo, 2024; Zondi et al., 2024). Addressing this gap, the study investigated the relationship between AI use and library engagement among university students in Southwest Nigeria. Specifically, it examined the extent to which students use AI for academic purposes, assessed their level of library engagement, determined whether a relationship exists between AI use and library engagement, and compared the level of library engagement between undergraduates with high and low AI usage. The findings aimed to provide locally grounded evidence that can guide pragmatic,

data-driven strategies to sustain libraries' relevance and reinforce their role in fostering rigorous and critically informed scholarship in an AI-driven academic environment.

Research Questions

The study was guided by the following research questions:

1. To what extent do undergraduates use AI tools for academic purposes?
2. What is the level of library engagement among undergraduates?
3. How can libraries enhance undergraduates' engagement in the era of AI-assisted learning?
4. What is the relationship between AI use and library engagement among undergraduates?
5. What is the difference in level of library engagement between undergraduates with high and low AI usage?

Research Hypotheses

The following null hypotheses were tested at a 0.05 level of significance:

H_{01}: There is no significant relationship between AI use and library engagement among undergraduates.

H_{02}: There is no significant difference in the level of library engagement between undergraduates with high and low AI usage.

Literature Review

In recent years, a distinct transformation has occurred in the academic landscape, marked by students' increasing reliance on AI to support learning. Early studies framed AI tools as supplementary aids, but newer evidence positions them as core components of student learning systems. Across countries, scholars note that platforms like ChatGPT, Grammarly and Quillbot have shifted students' study patterns from exploratory research to task completion (Baig, 2024; Vieriu and Petrea, 2025). This trend signals a movement away from traditional learning habits toward algorithm-assisted study. While Klimova and Pikhart (2025) acknowledge that AI enhances academic productivity and personalisation, researchers like Matsieli and Mutula (2025)

warn that it risks undermining critical thinking and ethical awareness. The situation is more pronounced in the Global South, where limited access to high-quality academic resources makes AI tools attractive substitutes. Ojo (2024) observed that Nigerian undergraduates increasingly depend on AI to complete assignments due to infrastructural and resource limitations. This pattern illustrates how AI use in developing regions is not merely about convenience but a response to systemic educational constraints. Collectively, these studies portray AI not only as a technological innovation but also as a socio-educational adaptation shaped by local contexts.

Parallel to the rise of AI, global studies reveal declining engagement with university libraries. What used to be the intellectual centre of the campus is now competing with an expanding digital ecosystem. Davis (2024) explains that students' preference for fast and algorithmic information access has displaced library-based inquiry, reducing time spent on critical evaluation. Yet this shift is not universal: Gbadebo (2023) found that satisfaction with digital library systems can sustain engagement if services are intuitive and relevant. In developed environments, libraries have redefined engagement by merging physical and digital experiences, blending electronic databases with interactive digital platforms. Conversely, in Nigeria and similar environments, library engagement continues to be hindered by infrastructural weaknesses, outdated systems and limited digital literacy (Adejo and Misau, 2021; Igbo, Imo and Jidere, 2024). This creates a two-speed environment: while students' information-seeking behaviour accelerates through AI, libraries often operate in slower and underfunded systems, widening the engagement gap and reinforcing underperformance.

The literature reveals contrasting interpretations of how AI use interacts with library engagement. Global trends indicate a mild-to-moderate negative correlation, where increased reliance on AI corresponds with lower use of library services (Lee, 2024; Zondi et al., 2024). This shift represents more than a technological preference, it reflects a reorientation of trust from institutional sources to algorithmic outputs. However, some scholars challenge this zero-sum perspective, suggesting that AI and libraries can be complementary rather than competitive (Emiri, 2023). In academic systems where AI is integrated into library services, such as intelligent discovery layers and AI chatbots, students report improved access and satisfaction (Kim, 2025). The divergence among these findings underscores a critical insight: the nature of the relationship between AI use and library engagement is mediated by institutional readiness. Where libraries innovate, AI enhances engagement; where they stagnate, it replaces it.

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In Nigeria, the trend reflects deeper structural inequalities within higher education. Research consistently points to underinvestment in library automation, limited internet connectivity and poor maintenance of e-resources (Sahabi and Otobo, 2021; Owolabi and Obasola, 2023). As a result, even when students intend to engage with libraries, system inefficiencies and limited staff support discourage sustained use. Gbadebo (2023) observed that Nigerian students' satisfaction with digital library systems depends largely on accessibility and system reliability, which are the very indicators where many institutions underperform. Meanwhile, students' increasing exposure to AI tools highlights a paradox: while global education shifts toward integrated human–machine collaboration, Nigerian libraries are still catching up with basic digital integration. The literature thus reveals a lag between technological adoption by students and institutional adaptation by libraries, a mismatch that complicates the prospects of meaningful engagement.

To address this disconnect, scholars advocate pragmatic strategies that merge technological innovation with human expertise. Davis (2024) and Zondi et al. (2024) emphasise that libraries should not compete with AI but co-evolve through collaboration, capacity building and ethical technology use. Emiri (2023) propose embedding AI into library operations to create smarter search experiences, while Adejo and Misau (2021) and Igbo et al. (2024) highlight the need for policy reforms, digital literacy programs and infrastructural upgrades. The overall trend in the literature suggests a transition from defensive adaptation to strategic integration, where libraries reposition themselves as AI-informed learning partners rather than traditional information gatekeepers. The emerging consensus is that sustaining engagement in the age of AI will depend on libraries' ability to combine credibility, convenience and technological agility to meet students at their new point of need.

Theoretical Framework

This study was guided by the Uses and Gratifications Theory (UGT) developed by Katz, Blumler and Gurevitch in 1973, which explains how individuals actively choose media or technologies to satisfy specific needs. The theory emphasises users' motivations such as convenience, efficiency and personal satisfaction in selecting among competing information sources. In this context, it helped explain why students increasingly turn to AI tools. These tools provide instant responses, privacy and personalised support, gratifications that traditional library systems may not always meet (Ojo, 2024; Klimova & Pikhart, 2025). Consequently, students' preference for AI use reflects

a shift toward self-directed, gratification-driven learning behaviors that shape how they engage with institutional resources.

Although the study did not measure all dimensions of UGT, the theory served as a conceptual lens for interpreting observed behaviors. It provided a framework for understanding students' preference for AI technologies as responses to evolving academic and emotional needs, offering insight into how gratification-seeking patterns influenced their level of library engagement.

Methodology

This study adopted a correlational survey design to investigate the relationship between artificial intelligence (AI) use and library engagement among undergraduates in state universities in Southwest Nigeria. The design was considered appropriate because it enabled the researchers to examine the degree and direction of association between the two variables without manipulating them.

The study was conducted in six state-owned universities in Southwest Nigeria: Lagos State University (LASU), Olabisi Onabanjo University (OOU), Osun State University (UNIOSUN), Ekiti State University (EKSU), Adekunle Ajasin University (AAUA) and Ladoke Akintola University of Technology (LAUTECH). These universities were purposively selected because they share comparable institutional characteristics relevant to the study. Specifically, they operate under similar state-level governance and funding structures, offer comparable academic programmes across major disciplinary fields and serve large undergraduate populations. Selecting institutions with these shared structural features helped minimised institutional disparities.

A multistage sampling procedure was employed to select respondents. In the first stage, the six universities constituted separate strata. In the second stage, undergraduates within each institution were stratified into five broad disciplinary clusters: Management and Education; Health and Medical Sciences; Science and Technology; Agriculture and Environmental Studies; and Arts, Humanities and Social Sciences. In the third stage, respondents were proportionately selected from these clusters during scheduled lectures and departmental activities to ensure broad representation across academic disciplines and institutions. A target of approximately 500 students from each university was used to achieve balanced institutional representation.

A total of 3,000 questionnaires were distributed across the six universities. Out of these, 2,894 were properly completed and returned, representing a response rate of 96.47%, which formed the basis for the analysis.

Data were collected using a structured questionnaire divided into three sections. Section A captured respondents' demographic information. Section B measured the extent of artificial intelligence use for academic purposes, while Section C assessed the level of library engagement among undergraduates. Items in the instrument were rated on a four-point Likert scale (1 = Very Low/Strongly Disagree to 4 = Very High/Strongly Agree). For descriptive presentation in the results tables, scale points were collapsed into two broader categories: Low Extent/Disagree (1–2) and High Extent/Agree (3–4) to enhance clarity of interpretation. However, all inferential statistical analyses were conducted using the original four-point scale values.

The instrument was subjected to face and content validation by three experts in Library and Information Science. A pilot study involving 50 undergraduates from a university outside the study area (Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti) was conducted to test the reliability of the instrument. The pilot test produced a Cronbach's alpha reliability coefficient of 0.87, indicating good internal consistency of the instrument.

Ethical considerations were strictly observed throughout the study. Participation was voluntary, respondents were provided informed consent before completing the questionnaire and anonymity was ensured by not collecting personally identifiable information.

Data collected were analysed using descriptive and inferential statistics. Frequencies, percentages, means and standard deviations were used to summarise respondents' characteristics and response patterns. Pearson's Product Moment Correlation (PPMC) was used to determine the relationship between AI use and library engagement among undergraduates. In addition, an independent samples t-test was used to examine differences in the level of library engagement between students with high and low levels of AI usage. All hypotheses were tested at the 0.05 level of significance.

Results and Analysis

Demographic information of respondents

Table 1: Demographic Characteristics of Respondents (n = 2,894)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	1,342	46.4
	Female	1,552	53.6
Age group	18 – 21 years	1.060	36.6
	22 – 25 years	1,152	39.8
	26 – 29 years	422	14.6
	30 years and above	135	4.7
Level	100 level	468	16.2
	200 level	634	21.9
	300 level	806	27.9
	400 level	736	25.4
	500 level	250	8.6
Discipline	Management and Education	583	20.2
	Health and Medical Sciences	565	19.5
	Science and Technology	581	20.1
	Agriculture and Environmental Studies	577	19.9
	Arts, Humanities and Social Sciences	588	20.3
Institution	LASU	491	17.0
	OOU	485	16.8
	OSU	470	16.2
	EKSU	487	16.8
	AAU	479	16.6
	LAUTECH	482	16.7
Source: Authors' Field Work		**2,894**	**100.0**

Out of the 2,894 respondents, females (53.6%) slightly outnumbered males (46.4%), indicating a fairly balanced gender representation. Most respondents were between 22 and 25 years (39.8%), followed by those aged 18–21 years (36.6%). The majority were in 300 level (27.9%) and 400 level (25.4%), reflecting greater participation from senior undergraduates. The distribution across disciplines was almost even, with Arts, Humanities and Social Sciences having the highest proportion (20.3%) and Health and Medical Sciences the least (19.5%). Institutional representation was also balanced, with each of the six universities contributing roughly similar shares (16–17%), suggesting equitable participation across institutions and disciplines.

Research Question 1: To what extent do undergraduates use AI tools for academic purposes?

Table 2: Extent of AI Use for Academic Purposes

S/N	ITEMS	High Extent (VH+H)	Low Extent (L+VL)	M	SD
1.	I often use AI tools for my coursework.	2,217 (76.6%)	677 (23.4%)	3.38	0.78
2.	I often use AI to summarise or explain study materials.	2,172 (75.1%)	722 (24.9%)	3.34	0.80
3.	AI helps me find relevant sources or references for my assignments.	2,168 (74.9%)	726 (25.1%)	3.33	0.79
4.	I use AI applications to improve my writing and editing.	2,182 (75.4%)	712 (24.6%)	3.35	0.78
5.	AI tools assist me in preparing presentations or research papers.	2,186 (75.6%)	708 (24.4%)	3.36	0.77

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6.	AI tools play a significant role in my academic activities.	2,210 (76.4%)	684 (23.6%)	3.37	0.75
			Grand mean = 3.36;	SD = 0.78	

Table 2 indicates that undergraduates make extensive use of AI tools for their academic tasks, with high response rates (VH + H ≥ 74%) and mean scores above 3.3 across all items. Respondents most frequently use AI for coursework, summarising study materials, improving writing and preparing research papers, reflecting a strong integration of generative and assistive AI in learning routines. The relatively low standard deviations (0.75–0.80) suggest uniformity in students' experiences, implying that AI has become a central, dependable academic aid that enhances study practices and productivity.

Research Question 2: What is the level of library engagement among undergraduates?

Table 3: Level of Library Engagement

S/N	ITEMS	High Extent (VH+H)	Low Extent (L+VL)	M	SD
7.	I visit the library physically to access books or study materials.	1,617 (55.9%)	1,277 (44.1%)	2.78	0.91
8.	I use the library's online databases and electronic resources.	1,589 (54.9%)	1,305 (45.1%)	2.81	0.89
9.	I seek help from librarians for academic information or guidance.	1,492 (51.6%)	1,402 (48.4%)	2.72	0.93
10.	I borrow print materials or use reserved books for study.	1,558 (53.9%)	1,336 (46.1%)	2.77	0.90
11.	I attend library-organised instructional or orientation programs.	1,375 (47.5%)	1,519 (52.5%)	2.61	0.95
12.	The library remains a valuable space for my learning and research.	1,684 (58.2%)	1,210 (41.8%)	2.86	0.88
		Grand mean = 2.76;	Mean SD = 0.91		

Table 3 presents library engagement among respondents, with slightly more than half reporting high usage (VH + H = 47–58%) and mean scores ranging from 2.61 to 2.86. While the library remains a valued academic space, participation in organised library programs is notably lower, suggesting a preference for self-directed or digital alternatives. This pattern reflects a steady but declining trend in traditional library use, as many undergraduates appear to prioritise the convenience and accessibility offered by AI tools and other online platforms.

Research Question 3: How can libraries enhance undergraduates' engagement in the era of AI-assisted learning?

Table 4: Strategies for Enhancing Library Engagement in an AI-Driven Era

S/N	ITEMS	Agree (SA+A)	Disagree (D+SD)	M	SD

13.	Libraries should blend AI tools with trusted academic resources.	2,195 (75.9%)	699 (24.1%)	3.37	0.83
14.	Librarians should teach students to use AI responsibly.	2,221 (76.8%)	673 (23.2%)	3.39	0.82
15.	The library should show where human expertise beats AI answers.	2,038 (70.4%)	666 (29.6%)	3.25	0.86
16.	AI-powered library apps can attract more student users	2,092 (72.3%)	802 (27.7%)	3.30	0.84
17.	Campaigns should promote credible, peer-reviewed library sources	2,130 (73.6%)	764 (26.4%)	3.33	0.83
18.	Faculty-library collaboration can link assignments to library use.	2,089 (72.2%)	805 (27.8%)	3.29	0.85

Grand mean = 3.32;   Mean SD = 0.84

Respondents strongly endorsed the proposed strategies for strengthening library engagement in an AI-driven academic environment, as indicated by the high grand mean score (3.32) and low variability (SD = 0.84). Most agreed that libraries should integrate AI tools with trusted academic resources (75.9%) and that librarians should guide undergraduates in responsible AI use (76.8%). Similarly, there was strong support for promoting credible, peer-reviewed sources and fostering faculty-library collaboration to link coursework with library resources. These responses show that respondents value a balanced approach where AI complements rather than replaces traditional library functions, underscoring the need for innovation, user education and academic partnerships.

Hypothesis 1: There is no significant relationship between AI use and library engagement among undergraduates.

Table 5: H_{01}: There is no significant relationship between AI use and library engagement among university students.

Variables	N	Mean	SD	r	p-value	Decision
AI Use	2,894	3.36	0.78	-0.428	.000	H_{01} Rejected
Library Engagement	2,894	2.76	0.91			

$**p < 0.05$

A moderate negative correlation was found between AI use and library engagement (r = –0.428, p < .05). This indicates that respondents who make greater use of AI tools for their academic activities tend to rely less on library resources for study and research. In essence, higher AI use

corresponds with reduced library engagement, confirming a statistically significant inverse relationship between the two variables.

Hypothesis 2: There is no significant difference in the level of library engagement between undergraduates with high and low AI usage.

Table 6: H₀₂: There is no significant difference in the level of library engagement between students with high and low AI usage.

Variables	N	Mean	SD	t-value	df	p-value	Decision
High AI Users	2,170	2.68	0.88	5.214	2,892	.000	H₀₂ Rejected
Low AI Users	724	2.91	0.93				

**p < 0.05

The independent samples t-test (t = 5.214, df = 2,892, p < .05) revealed a significance difference in library engagement between undergraduates with high and low AI usage. Those classified as high AI users (M = 2.68, SD = 0.88) recorded lower mean scores in library engagement compared to low AI users (M = 2.91, SD = 0.93). This finding implies that heavy dependence on AI tools diminishes undergraduates' likelihood of visiting or interacting with the library, reaffirming that the level of AI use significantly influences engagement with library resources.

Discussion of Findings

The findings revealed that undergraduates in Southwest Nigeria extensively use AI tools for academic purposes, relying heavily on them for coursework, writing assistance and summarising learning materials. This behavioural pattern supports Baig (2024), who emphasised that AI had become integral to students' learning routines by enabling personalisation and faster access to information. However, as Klimova and Pikhart (2025) cautioned, overreliance on AI may undermine deep learning and independent reasoning, particularly when students use AI-generated outputs without critical evaluation. These findings point to a significant behavioural shift among Nigerian undergraduates, AI tools have transitioned from optional aids into substitutes for traditional inquiry, transforming how students engage with knowledge.

Library engagement, by contrast, was found to be moderate. Although students still view libraries as relevant academic spaces, their participation in library programs and direct interaction with librarians remain low. This echoes Adejo and Misau (2021) and Igbo, Imo and Jidere (2024), who attributed declining engagement to infrastructural and technological deficiencies in Nigerian

libraries. Gbadebo (2023) further noted that satisfaction with library services depends heavily on digital accessibility, a condition many Nigerian libraries have yet to meet. These results suggest that declining engagement reflects not disinterest but structural and digital barriers that make AI tools more appealing.

The negative relationship between AI use and library engagement demonstrates that increased reliance on AI corresponds with reduced use of library services. This aligns with Lee's (2024) assertion that AI reshapes information-seeking behaviour from active exploration to passive consumption. Similarly, Zondi et al. (2024) warn that libraries that fail to adapt technologically risk marginalisation in students' academic lives. However, this relationship should not be seen as purely competitive. As Kim (2025) observes, libraries that incorporate intelligent search systems and chatbots often experience enhanced engagement. The findings therefore signal a need for integration rather than resistance, libraries must reimagine themselves as collaborators in the AI learning ecosystem.

Respondents' strong endorsement of AI integration into library systems further supports this point. Their call for responsible AI use and modernised library experiences aligns with Davis (2024) and Emiri (2023), who argue that blending AI with human expertise enhances both efficiency and ethical information access. Nigerian undergraduates' openness to such collaboration shows that they do not reject libraries; they seek hybrid environments that combine credibility, convenience and technology.

Overall, the discussion underscores a tension between rapid technological advancement and institutional inertia. Students' learning behaviours are evolving faster than library systems, widening the engagement gap. Bridging this divide requires innovation, capacity building and strategic collaboration. The evidence calls for libraries to transition from passive repositories to active and AI-enabled learning partners capable of meeting students in their digital ecosystem.

Implications for Practice

The findings carry important implications for academic libraries in Nigeria and comparable environments.

1. **AI Integration and Capacity Building**: Libraries must adopt AI technologies such as intelligent search tools, virtual reference chatbots and adaptive recommendation systems

while simultaneously training librarians to use these tools ethically and effectively. Combining technological innovation with human expertise will sustain relevance and trust.

2. **Strengthening Faculty–Library Collaboration**: Close collaboration with academic departments is vital for embedding library resources in coursework and research activities. When assignments require engagement with institutional databases or repositories, students are more likely to view libraries as indispensable partners.

3. **Infrastructure and Policy Reform**: Sustainable funding for automation, stable power supply and reliable internet connectivity are essential to narrow the digital divide between students' AI use and institutional capacity.

4. **Balanced Coexistence**: Libraries should embrace a hybrid model where AI complements rather than competes with human judgment. Such coexistence positions libraries as ethical and intellectual anchors in an algorithm-driven learning environment.

Conclusion

This study established that the increasing use of AI tools among undergraduates in state-owned universities in Southwest Nigeria correlates with reduced engagement with library resources. This signifies a shift towards faster, technology-driven learning habits and information use. While the library remains a valued academic space, the moderate level of engagement observed in this study suggests that AI tools are gradually substituting many traditional library functions.

These findings highlight an important implication: this shift in undergraduates' information-seeking patterns or habits simultaneously challenges university libraries to evolve beyond conventional service models and reposition themselves within an AI-mediated learning ecosystem. Libraries must integrate intelligent digital services, provide guidance on responsible use and strengthen partnerships with faculty to include library resources into teaching and assessment activities to maintain their relevance.

Overall, sustaining student engagement in the era of AI will require a balanced approach where libraries combine their traditional strengths such as credibility, human expertise and research support with speed, adaptability and convenience that AI tools provide. By embracing innovation and adopting a proactive role within the digital learning landscape, academic libraries can retain their central position in supporting undergraduates' academic activities.

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