EFFECTS OF AVAILABILITY OF ARTIFICIAL INTELLIGENCE BASED LIBRARY SERVICES ON STUDENTS' LEARNING EXPERIENCES IN SELECTED UNIVERSITIES IN SOUTHWEST, NIGERIA

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Abstract
The study investigated the effect of availability of artificial intelligence based library services on students' learning experiences in selected universities in southwest Nigeria, namely, Adeyemi Federal University of Education, Ondo, Ondo State and Federal University of Health Sciences, Ila Orangun, Osun State, with a total population of 12,000 and 2, 683 students respectively. A descriptive survey design was adopted, with a consecutive sample of 411 undergraduates (91.3% response rate) drawn from Yamanes' (1967) formula. A structured and Validated questionnaire (Cronbach's alpha coefficients above 0.70-0.73) measured availability of artificial intelligence based library services and students' learning

experiences. Data were analyzed using descriptive statistics and simple linear regression. Results showed that artificial intelligence based library services were generally available at low level (grand mean=1.57) across both institutions while students learning experiences were found to be generally unfavorable (grand mean= 2.98) although, moderately positive with respect to physical learning environments and staff responsiveness. Regression analysis also indicated that availability of artificial intelligence based library services did not significantly predict students' learning experiences (β= .082, R^2 = .007, p= .093) and the null hypothesis was retained. These findings are attributed to the near-absence of functional artificial intelligence based library services across sample institutions. The findings therefore, underscore the imperative for systematic investment in artificial intelligence infrastructure within Nigerian universities and holds far reaching implications for library policy, educational technology planning and broader agenda of digital transformation within African education.

Keywords*:* Artificial intelligence library services, Students' learning experiences, Academic libraries, Chatbots, Artificial intelligence cataloguing and classification, RFID.

Introduction

Higher education functions as a crucial mechanism for cognitive advancement, cultivation of human capital, the establishment of an informed society and national development by equipping students with knowledge, analytical abilities and research skills required to address contemporary challenges. The realization of these educational goals depends not only on classroom instruction but also on quality of academic support systems, particularly in university libraries, which provides services that facilitate access to information resources, research assistance and emerging learning technologies. Through these services, university libraries shape students' learning experiences by facilitating meaningful interactions with educational resources, library support and information systems and information services (Corrall & Jolly, 2019, Head et al., 2020). As higher education increasingly embraces technology, the integration of artificial intelligence into library services has become an important strategy for improving the quality of learning which supports students' educational outcomes (Konwar, 2024). General purpose artificial intelligence tools can be utilized in rendering library services, such as artificial intelligence chatbots such as Google Gemini and Microsoft Copilot, intelligent discovery platforms such as Ex Libris Primo and EBSCO AI, plagiarism detection tools such Turnitin and Grammarly and automated circulation technologies such as Radio Frequency Identification (RFID) and self service delivery (Okunlaya et al., 2022; Jain, 2023). According to the researchers, such technologies improves information retrieval, research support and library services by delivering timely, personalized access to information, strengthen academic integrity, increase students' engagement with library resources and improve learning experiences by facilitating continuous access to scholarly support irrespective of time and location (Foltynek et al., 2019; Labadze et al., 2023; Kumar et al., 2026). Therefore, the extent to which artificial intelligence based library services are available in university libraries substantially influence students' learning experiences. Artificial intelligence based library services improves information creation, retrieval and dissemination to academic community yet, its adoption in academic libraries in developing nations remains limited despite its potential to enhance students' learning experiences. Existing studies have largely focused on librarians' awareness, adoption challenges, technological capabilities, infrastructural requirements rather than students' learning experiences and educational benefits derived from these services. This knowledge gap necessitates empirical investigations to provide evidence for university administrators, librarians, and policy makers regarding the educational value of artificial intelligence enabled library services. Therefore, this study examines the effects of availability of artificial intelligence based library services on students' learning experiences in selected universities in southwest, Nigeria.

Statement of the Problem

Students' learning experiences are anticipated to be improved by timely access to resources, responsive learning environments and support services in libraries that facilitate personalized and inclusive engagement with academic resources. It has been observed that undergraduates in Nigerian universities have reduced learning experiences in libraries due to inadequate personalized learning resources, digital resources, virtual environment and limited support for learners living with disability. This gap persists despite the integration of technologies such as Artificial Intelligence chatbots, intelligent cataloguing and discovery systems, plagiarism detection tools and Radio Frequency Identification enabled systems that improve students learning experiences. However, actual availability of these services in Nigeria is observed to be low; with few institutions offering some of these services, students experience with artificial intelligence-based is reported to be unsatisfactory. It is against this backdrop that this study examines the extent to which availability of Artificial Intelligence-based library services affects students' learning experiences in selected universities in South-West, Nigeria.

Objectives of the Study

The specific objectives of the study were to:

i. identify the level of availability of artificial intelligence based library services in selected universities in Southwest, Nigeria:
ii. assess students' learning experiences in selected universities in Southwest, Nigeria and;
iii. examine the effect of the availability of artificial intelligence based library services on students' learning experiences in Southwest, Nigeria.

Research Questions

The study focused on the following research questions:

1. What is the level of availability of artificial intelligence based library services in selected universities in Southwest, Nigeria?
2. What are students' learning experiences in selected universities in Southwest, Nigeria?
3. What effect does the availability of artificial intelligence based library services have on students' learning experiences in selected universities in Southwest, Nigeria?

Hypothesis

A null hypothesis was formulated and tested at a 0.05 level of significance:

$\mathbf{H_{01}}$: Availability of artificial intelligence based library services has no significant effect on students' learning experiences.

Literature Review

Availability of Artificial Intelligence Library Based Services in University Libraries

Globally, artificial intelligence based library services has become a familiar contemporary technological advancement but unevenly available. General artificial intelligence tools such as Chatbots and virtual assistants such as Google Gemini and Microsoft Copilot are widely deployed for reference services, reshaping the library and information service landscape (Aboelmaged et al, 2024) by facilitating user engagement, reduction in response time and improving access to library resources (Wagwu et al., 2024; Achugbue, 2024). However, research on availability of artificial intelligence in Nigerian universities revealed that a low level of availability, with only one out of six universities having one available (Eruchi et al., 2025). Furthermore, artificial intelligence cataloguing systems such as Ex-Libris Alma and EBSCO Discovery are increasingly integrated into library websites, OPACs and Shelf guides to analyze content, generate metadata and improve information retrieval accuracy (D'Souza, 2024). Despite these advances, Oghuvwu et al. (2025) found that artificial intelligence cataloguing and classification tools scored below benchmark levels in southwestern Nigeria, indicating limited regional availability.

Likewise, artificial intelligence cataloguing and classification technologies employs machine learning algorithms to improve resource discoverability, provide relevant search results and accurately group related subjects, helping digital library department provide personalized learning experiences for students. When students effortlessly locate and revisit instructional materials through intelligent services, they become more behaviorally engaged with library resources (Cox, 2022; Kasneci et al., 2023). Furthermore, the availability of plagiarism detection tools encourages responsible scholarship by identifying writing issues and textual similarities, thereby strengthening students' academic integrity and research competencies (Galindo-Dominguez et al., 2025). In library's physical spaces, service kiosks and RFID enabled retrieval systems automate borrowing, returning and locating of resources, reducing waiting times and creating user-friendly environments that encourage library use (Vrontis et al., 2023). This provides technologically enhanced conducive learning environment that positively impacts students' learning experiences.

Methodology

This study adopted a descriptive survey research design to examine the effect of availability of artificial intelligence based library services on students' learning experiences in selected universities in Southwest, Nigeria. The design was considered appropriate because it facilitates the systematic description of a phenomenon, measures attitudes and explore predictive relationship among variables in their natural state without manipulation (Creswell &Creswell, 2023). The study population comprised undergraduates from Adeyemi Federal University of Education, Ondo (12, 000 students) and Federal University of Health Sciences, Ila Orangun (2,683 students) which were purposively selected because their functional digital library infrastructures and automated library services that provides an appropriate environment for investigating availability of artificial intelligence based library services. Using Yamane's (1967) formula at a 5% margin error, a minimum sample size of 384 was determined. To compensate for non-response, 450 questionnaires were administered through consecutive sampling to eligible undergraduate library users,

of which 411 were properly completed and returned, representing a response rate of 91.3%.

From the valid responses, 327 (79.6%) were obtained from Adeyemi Federal University of Education, Ondo while 84 (20.4%) respondents from Federal University of Health Sciences, Ila Orangun. Non-proportionate sample sizes in the institution reflects the relative population sizes of the two institutions, as a larger sample was drawn from Adeyemi Federal University of Education, Ondo, to ensure adequate and proportionate coverage of its larger student population. Data were collected using a structured questionnaire developed by the researchers. Face and content validity of the instrument were established through expert review by lecturers in Library and Information Science and Educational Technology, while a pilot study involving 30 students from outside the study area yielded. Cronbach's alpha coefficients ranging from 0.72 to 0.73, indicating internal consistency. Data were analyzed using IBM SPSS statistics using frequency counts, percentages, mean, standard deviations and simple linear regression. The hypothesis was tested at 0.05 level of significance using simple linear regression. Participation was voluntary and respondents' anonymity was maintained throughout the research process.

Results

Research Question One: What is the level of availability of artificial intelligence based library services in selected universities in Southwest, Nigeria?

Table 1: Availability of artificial intelligence based library services

Items	Mean	SD	Rank	Decision
The library's reference services integrate Google Gemini on the library website and mobile app for answering students' questions.	1.58	0.94	4	Low

Items	Mean	SD	Rank	Decision
Microsoft Copilot is available via the library portal for answering students' questions.	1.57	0.90	5	Low
There are platforms on the library website and mobile app for asking questions and receiving responses from librarians.	1.55	0.97	6	Low
Ex Libris is available for achieving search accuracy of relevant information in the library.	1.24	0.50	7	Low
EBSCO AI are available for easy discovery of relevance of academic materials.	1.73	1.08	3	Low
Turnitin is available for students' use as a research support service in the library.	1.91	1.20	2	Low
Grammarly is available for checking the similarity index of students' academic work.	2.25	1.33	1	Low
Radio Frequency Identification (RFID) is available at the circulation department for digital borrowing and returning of books.	1.17	0.47	8	Low
A self-service artificial intelligence library kiosk is available for 24/7 digital borrowing and returning of books.	1.12	0.43	9	Low
Grand Mean	**1.57**	-	-	**Low**

Note: Criterion mean = 3.00. High= 3.00-5.00; Moderate= 2.00-2.99, Low=1.00-1.99.

As presented in Table 1, the grand means score for the availability of artificial intelligence based library services was 1.57, indicating low level of availability in the sampled universities. The availability of Grammarly recorded the highest means score (M=2.25, SD= 1.33). Conversely, the availability of self-service artificial intelligence library kiosks had the lowest mean score (M= 1.12, SD= 0.43), indicating a particularly low level of availability. Other services, including Turnitin, EBSCO AI, Google Gemini, Microsoft Copilot, Ex-Libris, Radio Frequency Identification (RFID) and online platforms recorded mean scores ranging from 1.12 to 2.25, all of which falls within the low category.

Research Question Two: What are students' learning experiences in selected universities in Southwest, Nigeria?

Table 2: Students' Learning Experiences in the Sampled Universities

Items	Mean	SD	Rank	Decision
Educational Resources				
I have easy access to educational resources such as e-textbooks, digital libraries and databases.	3.47	0.95	1	Agree
Multimedia improve my understanding of course content.	3.40	1.02	5	Agree
I am able to personalize my learning by selecting library resources that match my course of study.	2.68	0.98	10	Disagree
Open educational resources available through the library enhance my learning experience.	2.75	0.95	8	Disagree

Items	Mean	SD	Rank	Decision
Learning Environment				
The physical environment of my university library is conducive and motivates me to study.	3.43	0.96	4	Agree
The virtual learning environment (e-library and online databases) supports my academic activities effectively.	2.61	1.03	12	Disagree
The social and psychological atmosphere in my university library encourages collaboration and active learning.	2.79	0.97	7	Disagree
Support Services				
My university library offers mentoring initiatives that support my academic development.	3.45	1.10	2	Agree
Library workshops improve my academic and research skills.	3.40	1.00	5	Agree
My library provides adequate digital disability support services (e.g. use of chatbots, research assistants, and AI cataloguing tools) that ensure inclusive learning for students in their various locations.	2.42	1.08	14	Disagree
Library staff are willing to assist students when needed.	3.44	0.97	3	Agree

Items	Mean	SD	Rank	Decision
Information Systems				
Library services improve my confidence in completing academic tasks	2.58	1.01	13	Disagree
Library services facilitate the quality of my learning experiences.	2.71	0.99	9	Disagree
Library services improve my efficiency in completing assignments.	2.63	1.04	11	Disagree
Grand Mean	**2.98**	**-**	**-**	**Disagree**

Note: Criterion mean = 3.0. Decision: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree.

As presented in Table 2, the grand mean score of 2.98 indicates that students were satisfied specifically on access to educational resources (M=3.40-3.47), the physical library environment (M=3.44), mentoring initiatives (M=3.45) and staff assistance (M= 3.44). The respondents also show general dissatisfaction with personalized learning support, open educational resources, virtual learning environments, digital disability support services and the contribution of library services to learning quality, confidence and assignment completion, all of which recorded mean scores ranging from 2.42 to 2.79, indicating a persistent gap in technology enhanced learning support.

Research Question Three: What effect does the availability of artificial intelligence based library services have on students' learning experiences in selected universities in Southwest, Nigeria?

Table 3: Simple linear regression analysis showing the effect of availability of artificial intelligence based library services on students' learning experiences.

Variable	B	T	P	R^2
Availability of artificial intelligence based library services	.082	1.684	.093	.007

Table 3 shows simple linear regression analysis on effect of availability of artificial intelligence based services on students learning experiences. The table yielded anR^2 of .007, indicating that the availability of artificial intelligence based library services explained only 0.7% of the variance in students' learning experiences. The regression coefficient was positive and but not statistically significant (β= .082, t=1.684, p= .093 > .05), indicating that the availability of artificial intelligence based library services did not significantly influence students' learning experiences in the sampled universities.

Testing of Hypotheses

Hypothesis 1: There is no significant effect of availability of artificial intelligence based library services on students' learning experiences.

Table 4: Regression Analysis on the Effect of AI Availability on Learning Experiences

Model	Sum of Squares	Df	Mean Square	F	Sig. (p)	R^2	Beta (β)	T
Regression	2.270	1	2.270	2.836	.093	.007	.082	1.684
Residual	327.406	409	.801					
Total	329.676	410						

Table 4 examines the effect of availability of artificial intelligence based library services on students' learning experiences using a simple linear regression. The analysis yielded an R^2 of .007, showing that only 0.7% of the variance in students' learning experience is accounted for by the availability of artificial intelligence based

library services. The ANOVA results showed an F = 2.836, p =.093. Since p > .05, the null hypothesis was retained.

Discussion of Findings

The descriptive findings of the study revealed that the availability of artificial intelligence based library services across surveyed institutions is largely unavailable. Similar study by Eruchi et al (2025) found very low, patchy adoption of artificial intelligence in six Rivers state university libraries, in Nigeria with only one, having a functional Chatbot. Consequently, because of the unavailability of these technologies, its effects on students' learning experiences was found to be negligible. Also, the study reported that traditional library support structures remain functional while significant shortcomings exist in the digital and technology enabled dimensions of students' learning experiences. Conceptual and regional studies in Africa showed that libraries still offer basic, largely traditional services, with slow transition to contemporary technology (Ateka et al., 2022; Nongalo, 2025; Rajkumar & Sitwala, 2025). Consistent with this, availability of artificial intelligence based library services was found to have no significant effect on students' learning experiences (β= .082, R^2= .007, p=.093) and the null hypothesis was retained. This outcome is best understood as direct non availability of artificial intelligence based library services in sampled institutions rather than evidence that artificial intelligence based library services are inherently ineffective. This aligns with related studies reporting that students are often aware of emerging technologies but actual usage and engagement is low due to skills gaps and limited infrastructure (Rajkumar & Sitwala, 2025; Musa et al., 2026, Maina et al, 2026). The findings underscore that the availability of artificial intelligence based library services is a fundamental prerequisite for their effect on students' learning experiences, implying that the educational benefits of these services can only be realized and empirically evaluated when they are provided.

Conclusion

The study found that the availability of artificial intelligence based

library services in the sampled institutions is generally low and their near-absence of services correspondingly showed no significant statistical effect on students' learning experiences. The findings suggest that improving availability of artificial intelligence based library services has potential to improve students' engagement, information access and overall learning experiences. Therefore, sustained institutional funding, supportive policies and strategic integration of artificial intelligence into university library services are essential to improve educational and prepare students for an increasingly digital academic environment.

Recommendations

The following recommendations were made:

1. **Investment in artificial intelligence library infrastructure to ensure availability:** University governing councils, state and federal agencies responsible for higher education funding including National Universities Commission (NUC) and Tertiary Education Trust Fund (TETFund) should implement explicit artificial intelligence library infrastructure as priority category within capital expenditure allocations to guarantee availability.
2. **Development of inclusive and technology enhanced learning environments:** University libraries should undertake systematic audits of their virtual learning environments to address structural barriers to student's engagement. There should be adequate availability of artificial intelligence technologies that offers inclusive services such as virtual assistants, artificial intelligence Chatbots, cataloguing and classification systems that offers round-the-clock services to students.
3. **Advancement of further empirical research and artificial intelligence library services in African higher education:** Further research should employ longitudinal and mixed-methods designs to capture the dynamic and evolving effects of artificial intelligence library services on learning over times. Research into perceptions and capacity needs of academic librarians with respect to artificial intelligence service implementation is also recommended as a priority agenda for library and information services.

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