

## Readiness and Barriers to (Ai) Literacy Integration among Academic Librarians in Universities in the North-West Nigeria

By

<sup>1</sup>Fatima Ibrahim Surakat, <sup>2</sup>Abdullahi Umar & <sup>3</sup>Idris Garba

<sup>1</sup>Kashim Ibrahim Library Complex (KIL), Ahmadu Bello University Zaria.

<sup>2&3</sup>FUDMA University Library Complex, Federal University, Dutsin-Ma, PMB 5001 Katsina State, Nigeria

### Abstract

*The integration of artificial intelligence into academic library services has become an immediate professional imperative, yet empirical evidence on AI literacy among librarians in developing countries remains limited. This study examined the readiness and barriers to AI literacy integration among academic librarians in North-West Nigeria. A descriptive survey research design was adopted, with a sample of 140 academic librarians drawn from federal and state universities across Kano, Kaduna, Katsina, Sokoto, Kebbi, Jigawa, and Zamfara states. A structured questionnaire comprising 50 items across four dimensions (technological, cognitive, psychological, and organisational readiness) was used for data collection. Data were analysed using mean, standard deviation, and ANOVA at 0.05 significance level. The findings revealed a low overall level of AI literacy among respondents (grand mean = 2.11), with basic awareness of AI and ChatGPT failing to translate into formal training or practical skills. While librarians demonstrated psychological readiness (grand mean = 3.31) characterised by positive attitudes and willingness to learn, they were not technologically ready (2.19), cognitively ready (1.86), or organisationally ready (1.77). Infrastructural barriers (grand mean = 3.99), particularly irregular electricity (4.12) and poor internet (4.08), and institutional barriers (4.00), particularly absence of AI policy (4.21) and lack of training (4.18), were identified as the principal obstacles. Significant differences in AI literacy were found based on years of experience ( $F = 8.234, p < 0.05$ ) and university type ( $F = 12.847, p < 0.05$ ), but not gender ( $F = 2.143, p > 0.05$ ). The study concludes that academic librarians in North-West Nigeria possess the willingness to embrace AI but are severely constrained by technological, cognitive, and organisational deficiencies requiring urgent intervention.*

**Keywords:** AI literacy, academic librarians, readiness, barriers

### Introduction

Artificial intelligence is rapidly becoming one of the most significant technological forces reshaping professional practice across the globe. It affects virtually every sector of modern society, including education, healthcare, commerce, and governance, and has long been identified as a powerful driver of efficiency, innovation, and service delivery in any knowledge-based economy. According to the National Universities Commission (NUC, 2024), the broad goals of academic library services in Nigerian universities shall be to support teaching, learning, and research through the provision of relevant, accurate, and up-to-date information resources, regardless of format. Academic libraries, as central pillars of higher education institutions, are not exempted from this transformation. It is in this regard that the International Federation of Library Associations (IFLA, 2024) clearly stated that libraries must actively embrace artificial intelligence as an instrument for enhancing information services, improving user experiences, and maintaining professional relevance in the digital age. In support of this, Cox (2021), Chiu (2023), Maphosa and Ndlovu (2023), and Okonkwo and Adebayo (2024) have all agreed that the future of library and information science is inextricably linked to the ability of librarians to acquire, integrate, and apply AI

competencies within their professional routines. Among the various categories of library professionals, academic librarians occupy a particularly strategic position. They serve as the primary information intermediaries between vast institutional knowledge repositories and the students, faculty, and researchers who depend on efficient access to accurate, timely, and ethically sourced information.

AI literacy is vital for any academic library to proceed effectively in the current technological era. The desirability of adopting artificial intelligence competencies for library service delivery cannot be overemphasised in making information access more efficient, accurate, and user-centred. AI literacy is a necessary competency that facilitates the integration of modern tools into reference services, cataloguing, user instruction, and data management. Hence, academic librarians need to be adequately equipped with AI knowledge and skills so as to achieve the goals of the university library system. Tella and Olubiyo (2023) provides a comprehensive categorisation of AI literacy dimensions and grouped them into the following:

- 1) **Technological Readiness Dimensions** these include access to functional computers, stable internet connectivity, reliable electricity supply, availability of AI-powered software platforms (such as ChatGPT, Microsoft Copilot, Elicit, and Scite), and institutional subscriptions to AI-enhanced databases.
- 2) **Cognitive Readiness Dimensions** these include knowledge of basic AI concepts (machine learning, natural language processing, generative AI), understanding of algorithmic bias, ability to apply prompt engineering techniques, capacity to evaluate AI-generated outputs for accuracy and relevance, and skills in integrating AI tools into reference and information literacy instruction.
- 3) **Psychological Readiness Dimensions** these include positive attitudes toward AI adoption, self-efficacy beliefs regarding the ability to learn and use AI tools, willingness to experiment with emerging technologies, reduced anxiety about technological displacement, and openness to continuous professional development in AI applications.
- 4) **Organisational Readiness Dimensions** these include existence of institutional AI policies, availability of formal training programmes, leadership support for technological innovation, budget allocation for AI infrastructure, collaborative opportunities with IT departments, and recognition of AI literacy as a performance evaluation criterion.

AI literacy is one of the critical competencies required of academic librarians in contemporary Nigerian universities. Its application makes library services more efficient, responsive, and user-focused; hence, there is a need to assess the readiness of librarians to acquire this competency and to identify the barriers that hinder its integration. Most AI literacy development requires financial investment in training, infrastructure, and subscription access; therefore, university administrators during budget planning must make provision for AI capacity building. But sometimes the money made available is not sufficient, or worse, is not allocated specifically to library technology training. According to Igwe and Osinulu (2024), the quality of library services that users receive bears direct relevance to the availability or lack thereof of AI-competent librarians, functional technological infrastructure, and the overall organisational culture within which learning and research support takes place. The AI literacy ecosystem consists of all types of readiness dimensions, including technological infrastructure, cognitive competencies, psychological dispositions, and organisational supports. The use of AI tools in library service delivery is of critical importance, as they help to stimulate user engagement, reduce response times, and promote deeper information discovery. It is against this backdrop that this study is set to assess the readiness and barriers to AI literacy integration among academic librarians in North-West Nigeria.

Many research studies point to the suggestion that the level of AI literacy among academic librarians in Nigerian universities remains inadequate for the demands of contemporary information service delivery.

The problem is more prevalent in regions like North-West Nigeria, where there is limited investment in digital infrastructure compared to southern zones. Many academic libraries in this region are faced with challenges of inadequate provision of AI-relevant infrastructure, insufficient training opportunities, absence of institutional AI policies, and limited leadership commitment to technological innovation (Adamu & Musa, 2023). The little available AI training that exists is often accessed by librarians in federal universities, with state university librarians being largely excluded. Every year, university administrations make announcements on digital transformation and modernisation of library services, yet many stakeholders have decried the insufficient quantity and quality of AI literacy programmes. It is a common situation in most academic libraries in North-West Nigeria to encounter librarians who have never received formal training on ChatGPT, who do not understand how algorithmic bias affects search results, who lack confidence in using AI for reference services, and who report feeling overwhelmed by the pace of technological change (Garba & Usman, 2024).

### **Statement of the Problem**

The integration of artificial intelligence into academic library services is becoming imperative. Globally, academic librarians are increasingly expected to possess AI literacy competencies that enable them to deploy generative AI tools, critically evaluate algorithmically generated outputs, and guide users through an increasingly AI-mediated information landscape (Cox, 2021). In Nigeria, the National Universities Commission has consistently emphasised the need for university libraries to adopt innovative technologies that enhance teaching, learning, and research support. However, despite these expectations, empirical evidence suggests that the majority of academic librarians in Nigerian universities remain inadequately prepared for this technological transformation. While existing studies conducted in Southern Nigeria have documented low levels of AI awareness and limited access to relevant training, these findings cannot be generalised to the North-West geopolitical zone, where contextual factors such as lower digital infrastructure investment, periodic security disruptions, and limited professional development opportunities create a uniquely challenging environment. To date, no empirical study has systematically investigated the readiness of academic librarians in this region to integrate AI into their professional practice, nor has any study comprehensively documented the specific barriers they face (Adamu & Musa, 2023).

It is in view of the above therefore, this research study seeks to study librarian's readiness and barriers to AI literacy integration in university libraries in the North-West Nigeria. Without empirical data on current AI literacy levels, multidimensional readiness status (technological, cognitive, psychological, and organisational), and specific barriers hindering integration, university administrators and policymaking bodies cannot design targeted, evidence-based interventions. Consequently, academic librarians in the region risk professional marginalisation, students continue to receive inadequate AI guidance, and the broader goal of positioning Nigerian university libraries as dynamic, technology-enabled knowledge hubs remains unfulfilled.

### **Objectives of the Study**

The main objective of this study is to assess the librarian's readiness and barriers to AI literacy integration in university libraries in the North-West Nigeria. Specifically, the following objectives are raised to guide the study:

1. To examine the level of AI literacy among librarians in universities in the North-West Nigeria;
2. To determine the librarian's readiness for AI literacy integration in universities in the North-West Nigeria

3. To identify the principal barriers hindering AI literacy integration among librarians in universities in North-West Nigeria.

### **Research Questions**

The following questions were raised to guide the study:

1. What is the level of AI literacy among librarians in universities in the North-West Nigeria?
2. To what extent are librarians ready to integrate AI into their professional practice in universities in the North-West Nigeria?
3. What are the principal barriers hindering AI literacy integration among librarians in universities in the North-West Nigeria?

### **Research Hypotheses**

The following hypotheses were formulated to guide the study at 0.05 level of significance:

**H<sub>01</sub>:** There is no significant difference in the level of AI literacy among librarians in universities in the North-West Nigeria and their years of professional experience.

**H<sub>02</sub>:** There is no significant difference in the readiness of librarians in universities in the North-West Nigeria for AI literacy integration and the type of university (federal versus state).

**H<sub>03</sub>:** There is no significant difference in the perception of barriers to AI literacy integration among librarians in universities in the North-West Nigeria and their gender.

### **Literature Review**

The concept of AI literacy has emerged as a distinct area of inquiry within library and information science scholarship over the past five years. Unlike traditional digital or information literacy, AI literacy specifically addresses the competencies required to understand, evaluate, and interact with artificial intelligence systems (Chiu, 2023). In the context of academic librarianship, AI literacy extends beyond mere tool usage to encompass the ability to explain how AI systems generate outputs, identify potential biases in training data, and maintain professional oversight when AI tools are deployed in reference services or user instruction (Maphosa & Ndlovu, 2023). Tella and Olubiyo (2023) identified four interconnected dimensions of technology readiness that apply directly to AI adoption among librarians: technological readiness (access to hardware, software, and connectivity), cognitive readiness (knowledge of AI concepts), psychological readiness (attitudes and self-efficacy), and organisational readiness (institutional policies and training opportunities). Each dimension operates interdependently; deficits in one area can undermine progress in others. This multidimensional perspective provides a robust analytical lens for investigating AI literacy integration in resource-constrained academic settings such as those found in North-West Nigeria.

Research on AI literacy among academic librarians in developing countries remains limited but is gradually expanding. In sub-Saharan Africa, studies have consistently identified infrastructure deficits as the primary barrier to technology adoption in libraries, including erratic power supply, inadequate internet bandwidth, and a shortage of modern computing devices (Akinola & Oyelude, 2023). In the Nigerian context specifically, Oluwole and Adeyemi (2024) found that fewer than thirty percent of academic librarians surveyed had received any formal training on AI tools, while Igwe and Osinulu (2024) documented that the majority of university libraries lacked any formal framework guiding the ethical or practical use of AI technologies. A critical gap in the existing literature is the uneven geographical coverage of research, with the vast majority of empirical studies conducted in the South-West and South-South geopolitical zones,

leaving northern regions severely under-represented (Adamu & Musa, 2023). The North-West zone has experienced unique challenges including periodic security disruptions, lower digital infrastructure investment, and limited access to continuing professional development programmes addressing emerging technologies (Garba & Usman, 2024).

The literature identifies three broad categories of barriers to AI literacy integration: infrastructural, institutional, and individual. Infrastructural barriers include unreliable electricity, poor internet connectivity, and limited access to AI-powered platforms. Institutional barriers include absence of formal AI policies, lack of structured training programmes, and insufficient budget allocation for technology adoption. Individual barriers include low self-efficacy beliefs, anxiety about technological displacement, and limited prior exposure to digital tools (Tella & Olubiyo, 2023). Understanding the interplay between these barriers is essential for designing effective interventions. This study therefore addresses the identified gaps by providing geographically specific, multidimensional empirical evidence on readiness and barriers to AI literacy integration among academic librarians in North-West Nigeria.

### Methodology

The study examined the readiness and barriers to AI literacy integration among academic librarians in North-West Nigeria. A descriptive survey research design was adopted for the study. The overall population consists of 247 academic librarians working in federal and state universities across the seven states of North-West Nigeria (Kano, Kaduna, Katsina, Sokoto, Kebbi, Jigawa, and Zamfara). Using the Research Advisors (2006) sample size table at 95 percent confidence level and 5 percent margin of error, a sample of 152 academic librarians was selected. A stratified random sampling technique was employed to ensure proportional representation from federal and state universities across the seven states. A Questionnaire was used as the instrument for data collection. The face and content validity of the instrument was ascertained by three experts in Library and Information Science and Educational Measurement. The reliability was tested using Cronbach's Alpha coefficient, and the overall reliability index of 0.87 was obtained, indicating high internal consistency. The data collected were analysed using mean and standard deviation to answer the research questions. For the hypotheses, Analysis of Variance (ANOVA) was employed to test H<sub>01</sub> (experience-based differences) and H<sub>02</sub> (university type differences), while an independent t-test was used to test H<sub>03</sub> (gender-based differences). All hypotheses were tested at 0.05 level of significance. The Statistical Package for Social Sciences (SPSS) version 27 was used for all analyses.

### Results

**Research Question 1:** What is the level of AI literacy among librarians in universities in the North-West Nigeria?

**Table 1: Mean Score and Standard Deviation of Responses of Academic Librarians on the Level of AI Literacy in North-West Nigeria**

S/N	Item Statement	Mean	S.D	Remark
1.	I am aware of the term "artificial intelligence"	3.42	0.78	Accepted
2.	I have heard of generative AI tools such as ChatGPT	3.18	0.85	Accepted
3.	I understand the basic concept of machine learning	2.15	0.92	Rejected
4.	I can explain how AI systems generate responses to user queries	1.98	0.88	Rejected
5.	I have received formal training on using AI tools for library services	1.64	0.76	Rejected
6.	I know what prompt engineering means	1.87	0.81	Rejected
7.	I can identify potential bias in AI-generated search results	1.92	0.79	Rejected
8.	I use AI tools to assist with reference services	1.73	0.74	Rejected
9.	I use AI tools to assist with cataloguing or metadata generation	1.55	0.69	Rejected

10.	I am confident in evaluating the accuracy of AI-generated information	1.88	0.83	Rejected
11.	I understand the ethical concerns surrounding AI use in libraries	2.24	0.91	Rejected
12.	I have demonstrated AI tools to students or faculty members	1.61	0.72	Rejected
13.	I keep myself updated on new AI developments relevant to librarianship	2.08	0.86	Rejected
14.	I feel comfortable learning new AI technologies without formal training	2.31	0.94	Rejected
15.	Overall, I consider myself AI-literate	1.95	0.82	Rejected

**Benchmark Mean: 2.50**

**Grand Mean: 2.11**

Table 1 presents the descriptive statistics regarding the level of AI literacy among academic librarians in North-West Nigeria. The table shows the grand mean of 2.11, which is less than the decision benchmark mean of 2.50. Items 1 and 2 of the responses were in agreement that academic librarians in North-West Nigeria possess basic awareness of AI concepts. Specifically, respondents agreed that they are aware of the term "artificial intelligence" (Mean = 3.42, SD = 0.78) and that they have heard of generative AI tools such as ChatGPT (Mean = 3.18, SD = 0.85). These two items were accepted because their mean scores are greater than or equal to 2.50. However, all the remaining 13 items were not in agreement, as their mean scores are less than 2.50. This indicates that academic librarians in North-West Nigeria lack substantive AI literacy competencies. Items that were rejected include understanding of machine learning concepts (Mean = 2.15, SD = 0.92), ability to explain how AI systems generate responses (Mean = 1.98, SD = 0.88), formal training on AI tools for library services (Mean = 1.64, SD = 0.76), knowledge of prompt engineering (Mean = 1.87, SD = 0.81), ability to identify bias in AI-generated results (Mean = 1.92, SD = 0.79), use of AI tools for reference services (Mean = 1.73, SD = 0.74), use of AI tools for cataloguing (Mean = 1.55, SD = 0.69), confidence in evaluating AI-generated information (Mean = 1.88, SD = 0.83), understanding of ethical concerns (Mean = 2.24, SD = 0.91), demonstration of AI tools to users (Mean = 1.61, SD = 0.72), keeping updated on AI developments (Mean = 2.08, SD = 0.86), comfort learning new AI technologies without formal training (Mean = 2.31, SD = 0.94), and overall self-assessment as AI-literate (Mean = 1.95, SD = 0.82). Therefore, the result signifies that while academic librarians in North-West Nigeria possess basic awareness of AI as a concept and familiarity with the name ChatGPT, this awareness has not translated into substantive knowledge, practical skills, formal training, or confidence in using AI tools for professional library services. The grand mean of 2.11, which is substantially below the benchmark mean of 2.50, implies that there is a low overall level of AI literacy among academic librarians in North-West Nigeria.

**Research Question 2:** To what extent are librarians in universities in the North-West Nigeria ready to integrate AI into their professional practice?

**Table 2: Mean Score and Standard Deviation of Responses of Academic Librarians on Readiness for AI Literacy Integration across Four Dimensions (N=140)**

Dimension	S/N	Item Statement	Mean	S.D	Remark
Technological Readiness	1.	Functional computers are available for my use at the library	2.95	1.02	Rejected
	2.	Stable internet connectivity is available during working hours	2.34	0.96	Rejected
	3.	Reliable electricity supply is available at my workplace	2.01	0.88	Rejected
	4.	I have access to AI-powered software platforms such as ChatGPT or Copilot	1.87	0.79	Rejected

Cognitive Readiness	5.	My institution subscribes to AI-enhanced databases	1.76	0.74	Rejected
	Dimension Grand Mean		2.19		Rejected
	6.	I understand basic AI concepts such as machine learning and natural language processing	2.12	0.91	Rejected
	7.	I can apply prompt engineering techniques effectively	1.68	0.73	Rejected
	8.	I can evaluate AI-generated outputs for accuracy and relevance	1.85	0.81	Rejected
	9.	I know how to integrate AI tools into reference services	1.72	0.76	Rejected
Psychological Readiness	10.	I understand how algorithmic bias affects information retrieval	1.91	0.84	Rejected
	Dimension Grand Mean		1.86		Rejected
	11.	I have a positive attitude toward adopting AI in library services	3.34	0.82	Accepted
	12.	I am willing to learn new AI technologies if training is provided	3.51	0.79	Accepted
	13.	I believe AI can improve my efficiency as a librarian	3.28	0.86	Accepted
	14.	I feel anxious about being replaced by AI technologies	2.95	0.94	Rejected
Organisational Readiness	15.	I am open to continuous professional development in AI applications	3.45	0.77	Accepted
	Dimension Grand Mean		3.31		Accepted
	16.	My institution has a formal policy guiding AI use in library services	1.54	0.68	Rejected
	17.	Formal AI training programmes are available to librarians at my institution	1.62	0.71	Rejected
	18.	My library leadership supports technological innovation	2.48	0.95	Rejected
	19.	Budget is allocated for AI infrastructure and training in my library	1.48	0.64	Rejected
	20.	My institution recognises AI literacy as a performance evaluation criterion	1.71	0.73	Rejected
	<b>Dimension Grand Mean</b>		<b>1.77</b>		<b>Rejected</b>

**Benchmark Mean: 2.50**

Table 2 presents the descriptive statistics regarding the readiness of academic librarians in North-West Nigeria for AI literacy integration across four dimensions: technological, cognitive, psychological, and organisational. The dimension grand means for technological readiness (2.19), cognitive readiness (1.86), psychological readiness (3.31), and organisational readiness (1.77) reveal a clear pattern: academic librarians in North-West Nigeria are only psychologically ready for AI integration, as evidenced by the grand mean of 3.31 exceeding the benchmark of 2.50, with respondents agreeing that they have positive attitudes toward adopting AI (Mean = 3.34), willingness to learn if training is provided (Mean = 3.51), belief that AI can improve efficiency (Mean = 3.28), and openness to continuous professional development (Mean = 3.45). However, respondents are not technologically ready, with all five items rejected due to deficits in functional computers (Mean = 2.95), stable internet (Mean = 2.34), reliable electricity (Mean = 2.01), access to AI platforms (Mean = 1.87), and institutional subscriptions (Mean = 1.76); not cognitively ready, with all five items rejected indicating low understanding of AI concepts (Mean = 2.12), inability to apply prompt engineering (Mean = 1.68), evaluate AI outputs (Mean = 1.85), integrate AI into reference services (Mean = 1.72), or understand algorithmic bias (Mean = 1.91); and not organisationally ready, with all five items rejected reflecting the absence of formal AI policies (Mean = 1.54), training programmes (Mean = 1.62), leadership support (Mean = 2.48), budget allocation (Mean = 1.48), and performance recognition (Mean = 1.71). Therefore, while academic librarians in North-West Nigeria possess the psychological willingness to embrace AI, their technological, cognitive, and organisational readiness remain critically deficient.

**Research Question 3:** What are the principal barriers (infrastructural, institutional, and individual) hindering AI literacy integration among academic librarians in North-West Nigeria?

**Table 3: Mean Score and Standard Deviation of Responses of Librarians on Barriers to AI Literacy Integration (N=140)**

S/N	Item Statement	Mean	S.D	Remark
<b>Infrastructural Barriers</b>				
1.	Irregular electricity supply hinders my ability to use AI tools	4.12	0.76	Accepted
2.	Poor internet connectivity limits my access to AI platforms	4.08	0.81	Accepted
3.	Lack of functional computers in my library is a major barrier	3.95	0.84	Accepted
4.	High cost of data subscription limits my use of AI tools	3.87	0.79	Accepted
5.	Inability to afford subscription-based AI platforms is a challenge	3.91	0.82	Accepted
	Dimension Grand Mean	3.99		Accepted
<b>Institutional Barriers</b>				
6.	Absence of formal AI policy in my library hinders integration	4.21	0.73	Accepted
7.	Lack of formal training programmes on AI for librarians is a barrier	4.18	0.78	Accepted
8.	Insufficient budget allocation for technology adoption in my library	4.05	0.80	Accepted

9.	Lack of leadership commitment to AI innovation is a problem	3.82	0.86	Accepted
10.	No recognition of AI literacy in staff performance evaluation	3.76	0.84	Accepted
	Dimension Grand Mean	4.00		Accepted
<b>Individual Barriers</b>				
11.	Lack of confidence in my ability to learn AI tools is a barrier	2.98	0.91	Rejected
12.	Anxiety about being replaced by AI discourages me from learning	2.54	0.96	Rejected
13.	I lack time to learn new AI technologies due to work demands	3.45	0.87	Accepted
14.	Limited prior exposure to digital tools makes AI learning difficult	2.75	0.92	Rejected
15.	Lack of interest in AI technologies is not a barrier for me	2.12	0.88	Rejected
	<b>Dimension Grand Mean</b>	<b>2.77</b>		<b>Rejected</b>

**Benchmark Mean: 2.50** (Mean  $\geq$  2.50 = Accepted/Barrier Present; Mean  $<$  2.50 = Rejected/Barrier Absent)

Table 3 presents the descriptive statistics regarding the barriers hindering AI literacy integration among academic librarians in North-West Nigeria across three categories: infrastructural, institutional, and individual, with dimension grand means of 3.99, 4.00, and 2.77 respectively, revealing that infrastructural and institutional barriers are the principal obstacles while individual barriers are minimal. For infrastructural barriers, all five items were accepted, with respondents strongly agreeing that irregular electricity supply (Mean = 4.12), poor internet connectivity (Mean = 4.08), lack of functional computers (Mean = 3.95), high cost of data subscription (Mean = 3.87), and inability to afford subscription-based AI platforms (Mean = 3.91) significantly hinder AI literacy integration. For institutional barriers, all five items were accepted, with respondents strongly agreeing that absence of formal AI policy (Mean = 4.21), lack of formal training programmes (Mean = 4.18), insufficient budget allocation (Mean = 4.05), lack of leadership commitment (Mean = 3.82), and no recognition of AI literacy in performance evaluation (Mean = 3.76) are significant barriers. For individual barriers, only one out of five items was accepted, with respondents agreeing that lack of time to learn AI technologies due to work demands (Mean = 3.45) is a barrier, while lack of confidence (Mean = 2.98), anxiety about being replaced (Mean = 2.54), limited prior exposure to digital tools (Mean = 2.75), and lack of interest (Mean = 2.12) were rejected. Therefore, the result signifies that infrastructural and institutional barriers are the principal obstacles hindering AI literacy integration among academic librarians in North-West Nigeria, with irregular electricity supply, absence of formal AI policy, and lack of training programmes being the most critical barriers.

### Hypotheses Testing

**H<sub>01</sub>:** There is no significant difference in the level of AI literacy among academic librarians in North-West Nigeria based on years of professional experience.

Variation	Sum of Squares	DF	Mean Square	F-ratio	P-value
Between Groups	18.472	3	6.157		
				8.234	0.000
Within Groups	101.328	136	0.745		
Total	119.800	139			

**P (0.000) < Sig (0.05) at DF (3, 136)**

Table 4 shows the F-ratio value of 8.234 at 3 degrees of freedom and 136 degrees of freedom within groups at 0.05 alpha level of significance. The probability level of significance P(.000) is less than 0.05. This means that there is a significant difference in the level of AI literacy among academic librarians in North-West Nigeria based on years of professional experience. The implication of this result is to reject the null hypothesis which states that there is no significant difference in the level of AI literacy among academic librarians in North-West Nigeria based on years of professional experience.

**H<sub>0</sub>2:** There is no significant difference in the readiness of academic librarians in North-West Nigeria for AI literacy integration based on type of university (federal versus state).

Variation	Sum of Squares	DF	Mean Square	F-ratio	P-value
Between Groups	22.561	1	22.561		
				12.847	0.000
Within Groups	242.139	138	1.755		
Total	264.700	139			

**P (0.000) < Sig (0.05) at DF (1, 138)**

Table 5 shows the F-ratio value of 12.847 at 1 degree of freedom and 138 degrees of freedom within groups at 0.05 alpha level of significance. The probability level of significance P (.000) is less than 0.05. This means that there is a significant difference in the readiness of academic librarians for AI literacy integration based on type of university. The implication of this result is to reject the null hypothesis which states that there is no significant difference in the readiness of academic librarians in North-West Nigeria for AI literacy integration based on type of university (federal versus state).

**H<sub>0</sub>3:** There is no significant difference in the perception of barriers to AI literacy integration among academic librarians in North-West Nigeria based on gender.

Variation	Sum of Squares	DF	Mean Square	F-ratio	P-value
Between Groups	4.892	1	4.892		
				2.143	0.145
Within Groups	315.008	138	2.283		
<b>Total</b>	<b>319.900</b>	<b>139</b>			

**P (0.145) > Sig (0.05) at DF (1, 138)**

Table 6 shows the F-ratio value of 2.143 at 1 degree of freedom and 138 degrees of freedom within groups at 0.05 alpha level of significance. The probability level of significance P(.145) is greater than 0.05. This means that there is no significant difference in the perception of barriers to AI literacy integration among academic librarians in North-West Nigeria based on gender. The implication of this result is to accept the null hypothesis which states that there is no significant difference in the perception of barriers to AI literacy integration among academic librarians in North-West Nigeria based on gender.

## Discussion of Findings

This study was carried out to assess the readiness and barriers to AI literacy integration among academic librarians in North-West Nigeria. Table 2 presented the descriptive statistics regarding the level of AI literacy among academic librarians in North-West Nigeria. The table showed the grand mean of 2.11, which is less than the decision benchmark mean of 2.50. Items 1 and 2 of the responses were in agreement that academic librarians possess basic awareness of the term "artificial intelligence" and have heard of generative AI tools such as ChatGPT. However, all remaining 13 items were not in agreement, indicating that librarians lack understanding of machine learning concepts, ability to explain how AI systems generate responses, formal training on AI tools, knowledge of prompt engineering, ability to identify algorithmic bias, practical use of AI for reference and cataloguing, confidence in evaluating AI-generated information, understanding of ethical concerns, and overall self-assessment as AI-literate. In line with this finding, Oluwole and Adeyemi (2024) found that fewer than thirty percent of academic librarians in Nigerian universities had received any formal training on AI tools. Similarly, Maphosa and Ndlovu (2023) found that AI literacy among academic librarians in developing countries remains critically low, with awareness rarely translating into practical competency.

Table 3 presented the descriptive statistics regarding the readiness of academic librarians for AI literacy integration across four dimensions. The dimension grand means for technological readiness (2.19), cognitive readiness (1.86), psychological readiness (3.31), and organisational readiness (1.77) revealed that librarians are only psychologically ready for AI integration. Respondents agreed that they have positive attitudes toward adopting AI, willingness to learn if training is provided, belief that AI can improve efficiency, and openness to continuous professional development. However, they are not technologically ready due to deficits in functional computers, stable internet, reliable electricity, access to AI platforms, and institutional subscriptions. They are not cognitively ready due to low understanding of AI concepts, inability to apply prompt engineering, evaluate AI outputs, integrate AI into reference services, or understand algorithmic bias. They are not organisationally ready due to absence of formal AI policies, training programmes, leadership support, budget allocation, and performance recognition. In line with this finding, Tella and Olubiyo (2023) found that Nigerian librarians demonstrate high psychological readiness for technology adoption but are constrained by technological and organisational deficiencies. Igwe and Osinulu (2024) similarly found that the majority of Nigerian university libraries lack formal frameworks guiding AI adoption.

Table 4 presented the descriptive statistics regarding the barriers hindering AI literacy integration across three categories. The dimension grand means for infrastructural barriers (3.99), institutional barriers (4.00), and individual barriers (2.77) revealed that infrastructural and institutional barriers are the principal obstacles. Respondents strongly agreed that irregular electricity supply, poor internet connectivity, lack of functional computers, high cost of data subscription, and inability to afford subscription-based AI platforms significantly hinder AI literacy integration. Respondents also strongly agreed that absence of formal AI policy, lack of formal training programmes, insufficient budget allocation, lack of leadership commitment, and no recognition of AI literacy in performance evaluation are significant barriers. For individual barriers, only lack of time due to work demands was accepted as a barrier. In line with this finding, Akinola and Oyelude (2023) found that infrastructure deficits remain the most commonly cited obstacles to AI adoption in sub-Saharan African academic libraries. Garba and Usman (2024) similarly found that academic librarians in North-West Nigeria face unique challenges including limited access to CPD opportunities and absence of institutional policies.

The hypotheses testing revealed a significant difference in AI literacy levels based on years of professional experience ( $F$ -ratio = 8.234,  $P < 0.05$ ), with less experienced librarians likely demonstrating higher literacy. A significant difference was also found based on university type ( $F$ -ratio = 12.847,  $P < 0.05$ ), with federal

university librarians showing higher readiness than their state university counterparts. This is consistent with Onyancha and Mutsvunguma (2024), who found that generational and institutional differences significantly affect AI readiness among African librarians. However, no significant difference was found based on gender (F-ratio = 2.143,  $P > 0.05$ ), indicating that male and female librarians perceive barriers similarly.

## Conclusion

This study examined the readiness and barriers to AI literacy integration among 140 academic librarians in North-West Nigeria and found that overall AI literacy is low (grand mean = 2.11), with basic awareness of AI and ChatGPT failing to translate into formal training or practical skills. Regarding multidimensional readiness, librarians are psychologically ready (grand mean = 3.31) with positive attitudes and willingness to learn, but not technologically ready (2.19) due to deficits in computers, internet, and electricity; not cognitively ready (1.86) due to poor understanding of AI concepts; and not organisationally ready (1.77) due to absence of policies, training, and budget. The principal barriers are infrastructural (3.99), particularly irregular electricity (4.12) and poor internet (4.08), and institutional (4.00), particularly absence of AI policy (4.21) and lack of training (4.18). Significant differences in AI literacy were found based on years of experience ( $F = 8.234$ ,  $p < 0.05$ ) and university type ( $F = 12.847$ ,  $p < 0.05$ ), but not gender ( $F = 2.143$ ,  $p > 0.05$ ). The study concludes that academic librarians in North-West Nigeria are willing to embrace AI but are severely constrained by technological, cognitive, and organisational deficiencies requiring urgent intervention.

## Recommendations

In line with the summary of findings and conclusions, the following recommendations are made:

1. University administrators should provide stable electricity, reliable internet connectivity, functional computers, and institutional subscriptions to AI-enhanced databases to address the technological readiness deficits among academic librarians in North-West Nigeria;
2. University libraries should develop and implement formal AI policies, establish structured training programmes on AI literacy, allocate dedicated budgets for AI infrastructure and capacity building, and recognise AI literacy in staff performance evaluation criteria to address organisational readiness gaps;
3. The Librarians' Registration Council of Nigeria (LRCN) and National Universities Commission (NUC) should collaborate to integrate AI literacy modules into continuing professional development programmes specifically tailored for academic librarians in North-West Nigeria;
4. Less experienced librarians should be paired with senior colleagues through mentorship programmes to facilitate knowledge transfer, given the significant difference in AI literacy levels based on years of experience; and
5. Federal and state governments should increase funding allocations to state university libraries to bridge the readiness gap between federal and state institutions, as state university librarians demonstrated significantly lower readiness in this study.

## References

- Adamu, B., & Musa, A. (2023). Geographical disparities in artificial intelligence research within Nigerian library and information science. *Nigerian Journal of Library and Information Science*, 18(2), 45-59.

- Akinola, A., & Oyelude, A. (2023). Digital infrastructure and AI readiness in sub-Saharan African academic libraries. *African Journal of Library, Archives and Information Science*, 33(1), 12-27.
- Chiu, D. (2023). Defining AI literacy for library and information professionals. *Library Hi Tech*, 41(3), 712-728.
- Cox, A. (2021). The impact of AI on academic library work: A literature review. *Journal of Academic Librarianship*, 47(2), 102302.
- Garba, K., & Usman, T. (2024). Continuing professional development for academic librarians in North-West Nigeria: Gaps and priorities. *Library Management*, 45(2), 112-128.
- Igwe, K., & Osinulu, I. (2024). Institutional policies and AI adoption in Nigerian academic libraries. *Library Review*, 73(1), 34-50.
- Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-16). Association for Computing Machinery.
- Maphosa, V., & Ndlovu, S. (2023). AI literacy for academic librarians in developing countries. *Journal of Library and Information Services in Distance Learning*, 17(3), 201-218.
- National Universities Commission. (2024). *List of approved federal and state universities in Nigeria*. NUC.
- Oluwole, D., & Adeyemi, O. (2024). Generative AI in Nigerian university libraries: Usage patterns and challenges. *Library & Information Science Research*, 46(2), 101265.
- Onyancha, O., & Mutsvunguma, G. (2024). Generational and geographic divides in AI readiness among African librarians. *South African Journal of Libraries and Information Science*, 90(1), 1-14.
- Research Advisors. (2006). *Sample size table*. <http://research-advisors.com>
- Tella, A., & Olubiyo, P. (2023). Multidimensional readiness for technology adoption among Nigerian librarians. *The Electronic Library*, 41(3), 267-285.