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AI adoption in academic libraries: Practices, challenges, and research opportunities

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Abstract

Background: The integration of artificial intelligence (AI) into academic library operations represents one of the most consequential shifts in contemporary library science. Although AI adoption has accelerated globally, empirical evidence documenting actual practices, adoption barriers, and future research trajectories in Nigerian academic libraries remains sparse. This gap is consequential: without a systematic evidence base, institutional decision-makers and professional bodies are compelled to allocate resources and formulate strategy in an evidential vacuum. This study advances the field by delivering the first institutionally stratified empirical investigation comparing federal and state university libraries in Nigeria, thereby contributing a novel and contextually grounded perspective to the global discourse on AI adoption in library and information science.
Purpose: This study examines the current state of AI adoption in Nigerian academic libraries, identifying the technologies deployed, the challenges encountered across technological, organisational, environmental, and individual dimensions, and emerging directions for future scholarly inquiry.
Methods: A descriptive survey design was employed. Data were collected from 245 library professionals drawn from 30 purposively selected federal and state university libraries across Nigeria using a structured, validated questionnaire (Cronbach's α = 0.87). Descriptive statistics and frequency distributions were used to analyse the data.
Results: Findings reveal that AI-powered catalogue search systems and chatbot-assisted reference services are the most widely adopted practices, while NLP tools and machine learning-based recommendation engines are gaining traction. Inadequate infrastructure, insufficient digital literacy, and limited funding constitute the most persistent barriers to adoption.
Conclusions: AI adoption in Nigerian academic libraries is at an early but promising stage, with significant variation across institutional types. The study concludes that targeted policy interventions, capacity-building initiatives, and sustained research investment are essential for scaling AI integration. These findings have direct implications not only for Nigeria but for the broader Global South library community seeking to navigate AI integration within resource-constrained environments.

Keywords:
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INTRODUCTION

Artificial intelligence (AI) has emerged as a transformative technological force reshaping virtually every sector of human enterprise (Bekbolatova et al., 2024; Raza et al., 2025). Within the domain of library and information science, AI is redefining how academic libraries acquire, organise, preserve, and disseminate knowledge (Cox & Mazumdar, 2022). Broadly defined, AI refers to the simulation of human intelligence processes by computer systems, encompassing capabilities such as learning, reasoning, problem-solving, perception, and natural language understanding (Colleret & Gingras, 2021). Highimpact scholarly outlets describe AI as systems designed to perform tasks that typically require human cognition, including adaptive learning, pattern recognition, and predictive analytics over largescale data (Dong et al., 2021). Recent reviews and studies of AI in library and digital library contexts show that AI integration spans from metadata extraction and enrichment to recommendation services and user behaviour modelling, underscoring the breadth of this technological transformation

The integration of AI into academic libraries has progressed from experimental curiosity to an institutional imperative over the past decade. Libraries worldwide are deploying AI-driven tools to enhance cataloguing accuracy, personalise information retrieval, automate routine reference queries, and generate actionable usage analytics (Fernandez, 2016; Konwar, 2024). These capabilities address long-standing operational inefficiencies and respond to the evolving information-seeking behaviours of academic communities. Early literature conceptualised AI adoption in libraries through the lens of automation; more recent scholarship positions AI as a cognitive partner capable of augmenting professional librarianship at the knowledge level (Cox, 2023). A growing body of empirical evidence attests to AI's measurable contributions to library service quality: AI-powered recommendation engines improve collection use statistics, conversational agents reduce reference desk workload by up to 40%, and NLP-based cataloguing tools significantly reduce processing time for new acquisitions (Biswas, 2024; Dote Pardo, 2026; Marasinghe et al., 2024)

Generative AI (GenAI) systems, particularly those built on large language models (LLMs) such as GPT-4, Gemini, and Claude, represent the most recent and arguably the most disruptive wave of AI integration in library services. These systems can generate coherent, contextually appropriate text, engage users in multi-turn conversational reference interactions, summarise large bodies of literature, and assist with systematic review processes (Lund & Wang, 2023). Their conversational fluency and breadth of knowledge make them well-suited to reference and instructional tasks, although concerns about hallucination, bias, and intellectual property remain active areas of debate in the library community (Bender et al., 2021).

Beyond bespoke AI tools, the embedding of AI capabilities within subscription-based platforms that libraries rely upon represents a significant and often underappreciated dimension of adoption. Major library platform vendors—

including Ex Libris, EBSCO, ProQuest, and Clarivate—have integrated machine learning, semantic search, and predictive analytics into their core discovery and management systems (Cox et al., 2019; Fernandez, 2016). This vendor-driven embedding creates opportunities for developing countries to leverage AI for collection development based on predictive analytics and library patronage statistics, while simultaneously meaning that many academic libraries are already interacting with AI-powered features without having made a deliberate institutional decision to adopt AI. Understanding the scope and depth of this embedded AI use is therefore critical to any accurate assessment of AI adoption.

These global developments find meaningful parallels in the emerging body of library and information science scholarship produced across the broader Global South, particularly in Southeast Asia, where researchers are actively interrogating how libraries adapt to digital transformation within resource-constrained and culturally distinctive contexts. This body of work, represented in peer-reviewed outlets such as Jurnal Kajian Informasi & Perpustakaan, illuminates several dimensions directly pertinent to the present inquiry and situates the Nigerian findings within an international conversation about equitable AI integration in libraries. Research on information-seeking behaviour among university students demonstrates that high-achieving graduates strategically navigate multiple information sources and deploy critical evaluation strategies to assess source credibility (Wati et al., 2023); similarly, students at Islamic universities exercise nuanced critical evaluation of digital sources, cross-referencing platforms and seeking expert validation to ensure information credibility (Mudawamah et al., 2023). These behavioural patterns establish the sophisticated service standard that AI-powered library tools must meet—not merely speed or convenience, but contextual relevance and trustworthiness—underscoring the urgency of developing AI recommendation and discovery capabilities suited to user needs. Scholarship on digital library development further demonstrates that web-based library systems tailored to under-resourced educational institutions can achieve high quality when grounded in user needs analysis and validated against internationally recognised standards such as DigiQUAL (Astiti et al., 2023)

Production, and Evaluation—a finding with direct implications for AI-enhanced digital library design in Nigerian universities where infrastructure gaps necessitate creative, user-centred solutions. Bibliometric analyses confirm that the strategic role of libraries is evolving in parallel across Asian and African developing-country contexts, with both communities seeking to leverage digital innovations, including AI, to support holistic user development, bridge systemic resource gaps, and serve as community hubs for professional learning (Irawati et al., 2025). At the level of digital literacy and information quality, research on young Indonesians' information experiences during a high-stakes political period reveals that digital engagement is deeply embedded in everyday life but simultaneously attended by significant risks of misinformation and digital literacy

deficits, leading to recommendations for enhanced digital literacy and information filtering (Hanifatunnisa et al., 2025)—a challenge that resonates strongly with the Nigerian context where library professionals face acknowledged AI competency gaps. Taken together, this Southeast Asian scholarship reinforces the understanding that the challenges facing Nigerian academic libraries—information access, user competency, digital infrastructure, and ethical information practice—are constitutive features of a shared Global South library development agenda, one to which the present study contributes empirical evidence from a West African context.

Despite these global and regional developments, the Nigerian academic library landscape has received strikingly limited scholarly attention with respect to AI adoption—a gap whose consequences extend well beyond academic incompleteness. Nigeria's Federal and State University system enrols millions of students and is served by a sizeable professional library workforce; yet institutional decision-makers, professional bodies such as the Librarians' Registration Council of Nigeria (LRCN), and government agencies charged with higher education policy are compelled to allocate resources and formulate strategy in an evidential vacuum. Absent a reliable baseline, AI adoption is likely to proceed in an ad hoc, reactive fashion, deepening the already documented digital divide between better-funded federal institutions and chronically under-resourced state universities (Oden & Owolabi, 2022)247 of library users in university libraries in Ogun State, Nigeria. Krejcie and Morgan (1970. If this knowledge gap persists, libraries in Nigeria risk being relegated to passive consumers of globally designed AI solutions that may be ill-suited to local informational needs, linguistic realities, and institutional contexts. This study addresses these gaps directly by providing the first institutionally stratified empirical investigation comparing AI adoption between federal and state university libraries in Nigeria—a novel analytical perspective absent from prior Nigerian and broader African library research that extends dominant technology adoption frameworks beyond their predominantly Western institutional contexts. The study is guided by four research questions: (1) What are the current practices of AI in academic libraries in Nigeria? (2) What types of AI technologies are used in academic libraries in Nigeria? (3) What types of challenges—technological, organisational, environmental, and individual—characterise AI adoption in Nigerian academic libraries? (4) What future research directions related to AI in academic libraries are recommended by practitioners?.

RESEARCH METHODS

This study adopted a descriptive survey design, which is appropriate for systematically gathering factual data about the characteristics, opinions, and experiences of a defined population without manipulating variables (Creswell & Creswell, 2018). The target population comprised all professional librarians employed in Nigerian federal and state university libraries, estimated at

approximately 1,800 individuals based on the most recent headcount data from the Librarians' Registration Council of Nigeria (LRCN). A purposive sampling technique was employed to select 30 university libraries—15 federal and 15 state—that had demonstrated at least a basic level of ICT infrastructure, operationalised as the availability of functional internet connectivity and at least one electronic library management system at the time of data collection. This threshold ensured respondents would have sufficient contextual knowledge to evaluate AI-related questions meaningfully. From each selected institution, a proportional cluster random sample was drawn; the clusters were categorised by institutional type (Federal and State), with each university treated as a discrete cluster whose allocation size was determined by its total professional staff complement, ensuring that findings accurately reflect the distribution of the library workforce across both sectors. The resulting sample comprised 245 library professionals.

The data collection instrument was a structured questionnaire developed by the researcher and adapted from validated instruments used in prior AI adoption studies (Biswas, 2024; Cox, 2023). The questionnaire comprised four sections: (a) demographic information, (b) current AI practices, (c) types of AI technologies, and (d) adoption challenges, all measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). An additional section on future research directions employed a ranking format. Rigorous attention was paid to validity and reliability. Face validity and content validity were assessed by a panel of three library science experts and two AI specialists who reviewed the instrument for clarity, appropriateness, and completeness, with their feedback incorporated before the pilot phase. Internal consistency reliability was confirmed through a pilot test with 30 respondents drawn from institutions outside the main study, yielding a Cronbach's alpha coefficient of 0.87, comfortably exceeding the recommended threshold of 0.70 (Nunnally, 1975). Trustworthiness was further supported through member checking, in which a subset of respondents reviewed preliminary interpretations to confirm that findings accurately reflected their intended meanings (Lincoln et al., 1985).

The questionnaire was administered via both physical distribution and an online Google Form link shared through institutional email lists and library association platforms. Data collection spanned eight weeks, with follow-up reminders issued at two-week intervals to maximise response rates. A total of 218 usable questionnaires were returned, representing an 88.97% response rate. Data were analysed using descriptive statistics—frequencies, percentages, and weighted mean scores—generated through SPSS version 27.0 and presented in tabular form to facilitate systematic interpretation and cross-institutional comparison. Weighted mean scores were interpreted against the scale midpoint (3.00): values below 3.00 indicated low adoption, while values at or above 3.50 indicated moderate to strong adoption or challenge severity.

RESULTS AND DISCUSSION

Table 1 presents the distribution of current AI practices across 218 responding library professionals in Nigerian academic libraries. AI-powered catalogue search and discovery systems registered the highest frequency of adoption, with 176 respondents (80.73%) confirming their use and a weighted mean of 4.21, indicating strong agreement regarding their operational presence. Chatbot-assisted reference and information services followed closely with 168 respondents (77.06%, WM = 4.15), suggesting that conversational AI tools have achieved relatively broad deployment. Automated circulation and interlibrary loan management was reported by 143 respondents (65.60%, WM = 3.89), while AI-driven literature recommendation systems and plagiarism detection tools were confirmed by approximately 58–60% of respondents. Natural language processing for metadata enrichment, predictive analytics for collection development, and AI-assisted systematic reviews occupied a middle tier of adoption with weighted means ranging from 3.18 to 3.47, indicating partial or emerging adoption. Voice-activated information retrieval registered the lowest frequency (62 respondents, 28.44%, WM = 2.77), reflecting its nascent status in the Nigerian context.

The pattern evident in Table 1 aligns with global trends documenting a preference for high-visibility, user-facing AI applications during early phases of adoption. Cox et al. (2023) observed that discovery and catalogue enhancement tools typically serve as the entry point for AI adoption in libraries because they produce immediate, measurable improvements in user experience with relatively modest implementation complexity—a dynamic consistent with diffusion of innovation theory wherein 'trialability' and 'relative advantage'

Table 1. Current Practices of AI in Academic Libraries in Nigeria

No.	Current AI Practices	Frequency (f)	Percentage (%)	Weighted Mean
1	AI-powered catalogue search and discovery systems	176	80.73	4.21
2	Chatbot-assisted reference and information services	168	77.06	4.15
3	Automated circulation and interlibrary loan management	143	65.60	3.89
4	AI-driven literature recommendation systems	131	60.09	3.74
5	Plagiarism detection using AI-based text analysis	126	57.80	3.68
6	Natural language processing for metadata enrichment	108	49.54	3.47
7	Predictive analytics for collection development	97	44.50	3.31
8	AI-assisted systematic review and bibliometric analysis	89	40.83	3.18
9	Intelligent tutoring and information literacy instruction	75	34.40	2.96
10	Voice-activated information retrieval systems	62	28.44	2.77

Source: Field Survey, 2024

drive early adoption (Rogers, 1983). The pronounced adoption of chatbot services corroborates findings by Biswas (2024) and Marasinghe et al. (2024)libraries tend to integrate artificial intelligence into their operations and service delivery. This can be further verified by reviewing the current state of knowledge regarding artificial intelligence and libraries. Therefore, the objectives of the study were to find the current status of knowledge regarding the application of artificial intelligence for library services and to investigate the research gaps in the application of artificial intelligence for library services. The study followed the Systematic Literature Review (SLR, who reported that conversational agents have become among the most commonly deployed AI tools in academic libraries globally, partly because they are available as plug-in modules within existing library management systems. The lower adoption of sophisticated practices—predictive analytics, voice retrieval—reflects infrastructure and capacity constraints documented by Oden & Owolabi (2022)247 of library users in university libraries in Ogun State, Nigeria. Krejcie and Morgan (1970. This finding gains additional significance when read alongside research on information-seeking behaviour in developing-country university contexts (Mudawamah et al., 2023; Wati et al., 2023), which demonstrates that academic library users increasingly expect personalised, digitally mediated information access—precisely the service model that higher-order AI tools are designed to support, reinforcing the urgency of progressive AI capability development. The institutionalisation of plagiarism detection within academic integrity policies—rather than as part of a deliberate AI strategy—suggests that the conceptual boundaries of 'AI in libraries' may be broader in practice than in scholarly discourse, a distinction with implications for how future AI adoption surveys are designed and interpreted.

Table 2 maps the distribution of specific

Table 2. Types of AI Technologies Used in Academic Libraries in Nigeria

No.	Type of AI Technology	Frequency (f)	Percentage (%)	Weighted Mean
1	Machine learning (ML) algorithms for search ranking	171	78.44	4.18
2	Natural Language Processing (NLP) tools	164	75.23	4.09
3	Large Language Models / Generative AI (e.g., ChatGPT)	152	69.72	3.97
4	Intelligent search and discovery platforms (e.g., EBSCO, Ex Libris Primo)	148	67.89	3.93
5	Chatbots and virtual reference assistants	139	63.76	3.83
6	Recommender systems (collaborative/ content-based filtering)	117	53.67	3.61
7	Optical Character Recognition (OCR) with AI enhancement	103	47.25	3.42
8	Computer vision for digitisation and image processing	87	39.91	3.21
9	Robotic Process Automation (RPA) for workflow management	74	33.94	3.01
10	Predictive analytics and data mining tools	68	31.19	2.92

Source: Field Survey, 2024

AI technologies across surveyed institutions. Machine learning algorithms for search ranking ranked first (78.44%, WM = 4.18), followed by NLP tools (75.23%, WM = 4.09) and large language models or generative AI tools (69.72%, WM = 3.97). Intelligent search and discovery platforms such as EBSCO Discovery Service and Ex Libris Primo, which embed AI capabilities within their core architecture, were reported by 148 respondents (67.89%, WM = 3.93), while chatbots and virtual reference assistants were confirmed by 139 respondents (63.76%, WM = 3.83). Recommender systems and OCR-enhanced digitisation tools occupied the middle range, while computer vision, robotic process automation, and predictive analytics tools formed the lower tier, each reported by fewer than 40% of respondents with weighted means below 3.30.

The technology profile in Table 2 reflects a pattern in which AI capabilities embedded within vendor platforms constitute the dominant mode of technology access for Nigerian academic libraries. This reinforces Fernandez (2016) argument that the most pervasive AI in academic libraries today is silently integrated into commercial systems rather than actively deployed as standalone institutional tools—a 'passive adoption' pathway distinct from the 'active institutional adoption' that most technology acceptance models presuppose. This finding is particularly compelling when considered alongside evidence from the Global South LIS literature: Astiti et al. (2023) Production, and Evaluation demonstrated that web-based digital library systems tailored to under-resourced institutions can achieve high quality ratings when designed with user needs at the centre, a model that informs how embedded vendor AI should be evaluated against local institutional realities rather than uncritically accepted. The high reported adoption of generative AI tools warrants careful interpretation; while 69.72% of respondents confirmed their use, the data do not distinguish between institutional deployment and individual practitioner use, suggesting that much of this adoption may be informal and unregulated—mirroring international observations by Lund & Wang (2023) regarding the rapid but often unstructured penetration of GenAI into professional library practice. The comparatively low adoption of RPA and computer vision technologies reinforces the need for capacity development strategies that progressively build toward more advanced AI integration.

Table 3 presents the challenge landscape across four analytical categories. Among technological challenges, inadequate ICT infrastructure and bandwidth emerged as the most severe barrier (193 respondents, 88.53%, WM = 4.51), followed by the absence of locally relevant AI training datasets (82.11%, WM = 4.38) and limited system interoperability with legacy library management systems (74.77%, WM = 4.12). In the organisational domain, insufficient dedicated AI implementation funding ranked highest (86.24%, WM = 4.46), followed by the absence of AI strategic plans or policies (79.82%, WM = 4.27) and staff resistance to change (67.89%, WM = 3.93). At the environmental level, inadequate government and regulatory support constituted the most critical challenge (83.03%, WM = 4.40), while vendor lock-in and high subscription costs

Table 3. Types of Academic Library Challenges to AI Adoption in Nigeria

No.	Challenge	Category	Frequency (f)	Percentage (%)	WM
1	Inadequate ICT infrastructure and bandwidth	Technological	193	88.53	4.51
2	Absence of locally relevant AI training datasets	Technological	179	82.11	4.38
3	Limited system interoperability with legacy LMS	Technological	163	74.77	4.12
4	Lack of dedicated AI implementation funding	Organisational	188	86.24	4.46
5	Absence of AI strategic plans or policies	Organisational	174	79.82	4.27
6	Resistance to change among library staff	Organisational	148	67.89	3.93
7	Inadequate government/ regulatory support for AI	Environmental	181	83.03	4.40
8	Vendor lock-in and high subscription costs	Environmental	165	75.69	4.14
9	Digital literacy gaps among library professionals	Individual	191	87.61	4.48
10	Fear of job displacement due to automation	Individual	144	66.06	3.88

Source: Field Survey, 2024

were confirmed by 75.69% of respondents. Among individual challenges, digital literacy gaps registered the highest severity (87.61%, WM = 4.48), whereas fear of job displacement was comparatively less pronounced (66.06%, WM = 3.88).

The challenge profile in Table 3 reveals a mutually reinforcing cluster of barriers that collectively constrain AI adoption across multiple dimensions simultaneously. The co-occurrence of infrastructural deficits, funding shortfalls, policy vacuums, and digital literacy gaps creates conditions in which AI adoption, even when technically feasible, is practically unsustainable without coordinated institutional and policy-level intervention. Theoretically, this multi-barrier configuration challenges single-factor adoption models and calls for a systems-level explanatory framework capturing the interdependencies among technological, organisational, environmental, and human factors—extending the Technology-Organisation-Environment (TOE) framework to incorporate the individual competency dimension that proved salient in this context. These findings resonate with Abayomi et al. (2020), who described the challenge landscape in Nigerian academic libraries as a 'layered barrier problem' requiring simultaneous action across technical, administrative, and human capacity dimensions. The severity of digital literacy gaps (WM = 4.48) must be interpreted alongside Global South LIS evidence: Hanifatunnisa et al. (2025) documented pervasive digital literacy deficits even among active social media users in Indonesia, underscoring that if such gaps characterise regular digital consumers, the challenge facing library professionals who must operationalise complex AI tools in institutional settings is considerably greater and demands structured, profession-wide capacity-

development responses. The critical absence of locally relevant AI training datasets (WM = 4.38) compounds this challenge: AI systems trained predominantly on Global North corpora risk systematically filtering out or undervaluing local scholarly output, exacerbating epistemic marginalisation and reinforcing what scholars term 'colonial information hierarchies'—a risk explicitly recognised by the UNESCO Recommendation on the Ethics of Artificial Intelligence (Unesco, 2022). The moderate severity attributed to staff resistance (WM = 3.93) and fear of job displacement (WM = 3.88) suggests that attitudinal barriers are not the primary obstacle in the Nigerian context, distinguishing this finding from studies in higher-income settings and underscoring the importance of structurally focused rather than psychologically focused interventions.

Table 4 presents the research directions respondents identified as priorities, ranked by frequency and priority score. The impact of AI tools on reference service quality and user satisfaction emerged as the highest-priority direction (197 respondents, 90.37%, Rank 1), indicating strong practitioner consensus about the need for evidence of AI's effectiveness from the user perspective. AI-driven collection development strategies in resource-constrained settings ranked second (84.40%), digital literacy and competency development ranked third (80.73%), and the ethical implications of AI use ranked fourth (77.52%). GenAI and LLM integration in cataloguing workflows ranked fifth (74.31%), vendor AI capabilities and institutional decision-making ranked sixth (70.64%), while cross-institutional collaboration models, AI readiness frameworks for African ecosystems, user

Table 4. Recommended Future Research Directions Related to AI in Academic Libraries in Nigeria

No.	Recommended Future Research Direction	Frequency (f)	Percentage (%)	Priority Rank
1	Impact of AI tools on reference service quality and user satisfaction	197	90.37	1st
2	AI-driven collection development strategies in resource-constrained settings	184	84.40	2nd
3	Digital literacy and competency development for AI in library practice	176	80.73	3rd
4	Ethical implications of AI use in academic libraries (bias, privacy, transparency)	169	77.52	4th
5	GenAI and LLM integration in library cataloguing and metadata workflows	162	74.31	5th
6	Vendor AI capabilities and institutional library decision-making	154	70.64	6th
7	Cross-institutional collaboration models for AI adoption in Nigerian universities	147	67.43	7th
8	AI adoption readiness frameworks tailored to African library ecosystems	139	63.76	8th
9	User acceptance and trust in AI-mediated library services	131	60.09	9th
10	Longitudinal studies on the transformational effects of AI on library staffing	119	54.59	10th

Source: Field Survey, 2024

acceptance studies, and longitudinal staffing impact studies occupied positions seven through ten with frequencies between 54.59% and 67.43%.

The research priorities in Table 4 collectively delineate an agenda that balances immediate practice needs with longer-term strategic concerns, and importantly, connects the Nigerian findings to the broader Global South library research conversation. The primacy of user satisfaction research reflects a practitioner conviction that the justification for AI investment must be grounded in demonstrable service improvements (Dote Pardo, 2026). This aligns with Global South LIS scholarship demonstrating that academic users deploy sophisticated, multi-source information strategies and exercise nuanced critical evaluation (Mudawamah et al., 2023; Wati et al., 2023)—setting a standard that AI-powered library services must meet not merely in speed or convenience, but in contextual relevance, accuracy, and trustworthiness. The second-ranked priority—collection development in resource-constrained environments—speaks to the chronic resource scarcity documented by Oden & Owolabi (2022)247 of library users in university libraries in Ogun State, Nigeria. Krejcie and Morgan (1970 and is directly complemented by Astiti et al. (2023) Production, and Evaluation demonstration that digital library solutions built for under-resourced contexts can achieve excellence when grounded in user needs. The high priority accorded to ethical AI research is particularly significant given the absence of indigenous language datasets: if AI systems are trained predominantly on Global North corpora, they risk reinforcing colonial information hierarchies that render local scholarly output invisible (Unesco, 2022). The eighth-ranked priority—AI adoption readiness frameworks for African library ecosystems—reflects a disciplinary awareness that frameworks developed in Western contexts cannot be uncritically applied to African institutional environments. This imperative is affirmed by Irawati et al. (2025) bibliometric analysis, which demonstrates that libraries across developing-country contexts increasingly share a common agenda of harnessing digital innovation, including AI, to support holistic user development and bridge systemic resource gaps—a shared agenda to which the findings of this study make a substantive and empirically grounded contribution.

CONCLUSION

This study reveals that artificial intelligence adoption in Nigerian academic libraries has transitioned from a peripheral concept into an uneven operational reality, driven primarily by vendor-embedded pathways such as automated catalogue searches, chatbot reference services, and machine learning-based discovery tools. While this momentum is genuine, widespread integration faces a formidable system of institutional constraints, including inadequate infrastructure, funding deficits, absent policy frameworks, and digital literacy gaps that cannot be resolved by individual practitioners in isolation. Theoretically and practically, this research establishes a critical empirical baseline for the Sub-Saharan African context, expands

traditional technology adoption models by highlighting individual competency as a distinct analytical dimension, and connects these insights to a broader, shared global development agenda for libraries across the developing world. To transform these insights into a strategic roadmap, it is recommended that the Librarians' Registration Council of Nigeria implements a standardized AI Competency Framework for professional licensing, supported by national strategies for funding benchmarks and inter-institutional consortia for shared infrastructure. However, these findings must be interpreted within certain limitations, including a potential optimism bias from sampling institutions with existing information technology capabilities, a cross-sectional design capturing only a single temporal snapshot, reliance on self-reported insights, a lack of data disaggregation by respondent demographics, and the use of an assessment instrument adapted from non-local contexts. Future research should address these gaps by developing bespoke instruments tailored directly to regional library realities and analyzing individual respondent characteristics to formulate targeted capacity development programs.

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Author Contributions

KSJD: Conceptualisation, methodology, data collection, formal analysis, writing—original draft. ROQ: Supervision, writing—review and MD: Editing. All authors have read and agreed to the published version of the manuscript.

AI Declaration

The authors declare that artificial intelligence (AI) tools, such as ChatGPT (OpenAI) and Gemini, were used solely to assist with language editing, grammar correction, and improving the clarity of the manuscript, and were not involved in the study design, data collection, analysis, interpretation, or generation of scientific conclusions; all AI-assisted content was carefully reviewed and validated by the authors, who take full responsibility for the integrity and accuracy of the work.

Data Availability Statement

The data is available by request to the author.

Conflicts of Interest

The authors declare no conflict of interest.

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