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The Role of Artificial Intelligence in Enhancing Effective Library Service Delivery to Support Teaching, Learning, and Research in Nigerian Higher Institutions

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ABSTRACT

The aim of this paper is to discuss role of Artificial Intelligence (AI) in enhancing effective library service delivery to support teaching, learning, and research in Nigerian higher institutions. Based on the existing infrastructural, monetary, and capacity limitations in Nigerian university libraries, the paper analyze highlighted AI instruments such as chatbots, semantic search engines, predictive analytics platforms, and digital preservation systems can without no doubt advance the excellence, user-friendliness, and fairness of academic services. The core of the argument is that AI should support rather than take over librarians, allowing them to concentrate on moral governance, research facilitation, and pedagogy. The paper ends with six strategic recommendations which are integrating AI into national and institutional policy frameworks, testing AI tools at top universities, investing in infrastructure, providing thorough AI literacy education, establishing public-private collaborations and establishing strong data privacy and ethical oversight. The purpose of these ideas is to help decision-makers, library administrators, and academic stakeholders in achieving Nigeria's goal of having academic libraries that are digitally accessible and AI-ready.

Keywords: Artificial Intelligence, Academic Libraries, Nigerian Higher Education, Library Service Delivery, AI Literacy, Digital Preservation, Chatbots, AI Ethics.

Introduction

Artificial Intelligence (AI) is transforming fields of knowledge globally especially within academic libraries which are witnessing a transition from analog to digital in a bid to provide users with more information. A breakthrough in National language processing, machine learning and dialogue systems has culminated in the establishment of veritable tools like chatbots, smart search, engines and predictive analytics which enhance discovery outreach and decision making. In Nigeria, AI's benefit has not been harnessed despite its ability to intimate one with global trends. This article posits that AI would bring a remarkable change in Nigerian academic libraries providing a great support for teaching, learning and research if factors like policy gaps, financial scarcity, infrastructure fragility and skills deficits are properly handled.

Library systems breed a fertile ground for research improved services can influence publication output, improve students' performance and project the image of the institution in good light. However, the inability to adapt risks aggravates the digital divide between Nigerian universities and their global contemporaries in the wake of new trends like the National AI strategies and other academic training programmes which hint at a positive future development.

This paper discusses six interrelated themes: (1) Current conditions of Nigerian academic libraries; (2) AI's transformative roles; (3) Adoption barriers; (4) Policy and funding implications; (5) Strategies recommendations and (6) a closing call to action

There are arguments on systematic reviews, surveys, and case studies centred on ways to engender a positive and pragmatic vision of AI-enabled libraries both at local and international level.

Current State of Nigerian Academic Libraries

Outdated Systems and Limited Digital Resources

Inspite of the innovations in Nigeria higher education sector, it is disheartening that many academic libraries are still glued to the old-fashioned electronic cataloguing systems.

Digital collections are less patronized, undermined and devoid of meta data consistency and full-text accessibility. Idemudia and Makinde (2022) revealed that cataloguing, classification and indexing are manual, ineffective and prone to error. Ademojo etal. (2025) maintained that knowledge organization and retrieval pipelines are bedeviled by systematic under investment and outdated platforms.

Infrastructure Instability

Epileptic power supply and poor internet facilities are banes confronting campuses. Akinola (2023) and Adeleke etal. (2024) observed that inadequate infrastructure has adverse effect on digital service reliability which makes the adoption of basic automated systems practically impossible.

Human Resource Constraints

There are few librarians attending to a large number of students. This situation only makes librarians to be entangled with routine processes and not giving attention to research support, instructional services or technological innovation. In a 2024 survey by Oyetola etal, funding, infrastructure limitations and low AI literacy as factors affecting strategic adoption.

Digital Preservation Weaknesses

Inspite of some evidences of digitalization, files lack proper meta data or stored in unsuitable environments. Adewojo etal. (2025) sees this as a critical fragility: without a well-planned curation, digital tools cannot be assessed and they could become useless with time.

Emerging AI Awareness, Limited Use

The use of chatbot pilots among librarians and models such as chatGPT and Gemini attests to the fact that people's interest in AI is increasing. However, the usage is these tools is personal and institutional.

Public-Private Momention

Local initiatives like CDIAL and AI-focused partnerships hint at a for multilingual AI tools for libraries.

The institutional adoption of milestone is still hanging in the balance.

How AI can Transform Library Services

AI-driven chatbots have become a catalyst for effective reference service delivery in Nigerian academic libraries. A 2024 study by Wagwu et al. observed that librarians subscribe to the applicability of chatbts in carrying out routine inquiries which improve user accessibility, enable 24/7 engagement, and relieve staff of herculian tasks inspite of the threats posed by infrastructure and awareness. In a related development, Makinde etal. (2024) carried out a research on ChatGPT. This research shows remarkable progress in student support, workload distribution, and user satisfaction. Pilot implementations on library web portals reveal the means through which automated FAQs, catalog assistance, and citation guidance can improve the reference experience.

Chatbots are not perfect. Adetayo 2023 laments in accurate responses which are a child of inadequate training data. This situation underscores the need for ongoing duration and librarian oversight. The use generative AI chatbots in higher education exposes us to another danger: over reliance and lack of academic integrity in research guidance. However, with adequate technical frameworks, supervision and transparent design, the advantages of generative AI chatbots outweigh the disadvantages.

In terms of discovery, AI-driven search and recommendation systems is an invaluable asset in relevance and personalization. A 2025 study explained that AI-enhanced cataloguing culminates in improved metadata consistency and search precision Nigerian libraries. Internationally, research shows that NLP-supported systems promote user discovery by deciphering meaning, improving seven dipitons browsing, and delivering guided paper suggestions. Librarians remark that these systems reduce the Boolean searches and give room for more intuitive harnessing of digital tools and journals.

AI also enhance academic writing and integrity. Nigerian tertiary institutions are more familiar with tools like Grammarly and Turniting and not really AI, yet hinting at digital scholarly practices. Moreover, predictive analytic platforms are springing up. These platforms capable of forecasting high demand materials or disciplines which allows collection development based on user behavior patterns. Despite that fact that total adoption of the AI in this regard is still hanging in limbo, studies from South-West Nigeria reveal that librarians are eager to adopt automation and usage analytics for more effective acquisition.

Preservational AI has a critical dimension. OCR-based tools, image restoration algorithms and automatic metadata extraction enable libraries to preserve fragile archives with little human effort. Nigerian research from 2025 stipulates that AI-powered digital preservation could amdiorate metadata errors by over 40% making it possible for rare resources to be assessed over a long period of time. This work is I consonance with global trends where the AI and anomaly detection serve as potent tools for preserving library collections.

Finally, the AI does not render librarians irrelevant. Rather, it complements their roles. Since automated systems take care of regular cataloguing, FAQs, and statistics, librarians could focus on instructional design, research consultation, and digital literacy advocacy. Idemudia and Makinde (2022) describe this as the "librarian-as-facilitator" model, stressing that AI should complement and not substitute professional roles. In practical terms, this donates that librarians could mediate between digital tools and scholarly needs-by supervising AI accuracy, intervening critical or confusing situations and training users.

Challenges of AI Adoption in Nigeria

AI's great roles in revamping library services in Nigeria is hampered by infrastructural challenges. Imspite of innovative programmes like the computers for all Nigerians initiative (CANi), many campuses are constrained by epileptic power supply and poor internet services. These factors have an adverse effect on AI systems such as chatbots and analytics dashboards. Again, digital preservation efforts are affected by poor storage and backup facilities, as observed by Adeuojo et al. (2025) who decried the lack of sustained institutional investments.

Financial constraints are another nagging problem. Previous researches show that AI-enhanced tools like chatbots, smart indexing systems, and preservation platforms could only thrive on infrastructural and licensing budgets of several years which could rarely be found in most universities. Wagwu et al. (2024) and the 2025 Nigerbiblios both confirmed that there is limited financial capacity for AI investments.

Human capital limitations also affect implementation. Inspite of the fact that Nigerian librarians are familiar with AI technologies and their gains, the readiness to embrace the AI is at a very low ebb. A 2025 South-West Nigeria survey showed that librarians are prepared it handle AI-generated metadata or perform coding, algorithmic auditing, or system configuration which are all basic requirements for sustainable deployment.

Resistance and Professionalism also pose a serious threat. Odigie's 2024 North Central Nigeria study submitted that librarians worry about possible jobless inspite of their enthusiasm about AI. This negative trend as well as change management initiatives account for the cold feet institutions develop towards the AI.

Policy frameworks to support AI integration in libraries are ineffective. Although Nigeria's National AI-strategy and Digital Economy policy portrays education in good light, library specific guidelines, standards for data privacy, algorithmic bias control, or ethical deployment are not feasible. Nigerbiblio's 2025 review reveals an urgent need for sectoral policy support.

Finally, the prospect of adopting the AI may breed a ground for disparities except a proper coordination is put in place. If only famous universities like (UNILAG, UI, UNN) enjoy AI pilots, other institutions would be plunged into a state of backwardness. Nigeria's digital divide as shown in a 2025 analysis bears an eloquent testimony to the fact that economic, literacy and infrastructure inequities could engender a tiro-tiered academic ecosystem.

Conclusion

This paper has argued that Artificial Intelligence is not an addendum in Nigerian academic libraries but an innovation which is designed to add more value to pedagogy and research. Without AI-driven enhancements chatbots, smart discovery, research aids, and preservation systems, libraries would not be in pole position to fraternize with global trends. Findings have shown that AI chatbots reduces the strain of routine inquiries and extend support beyond traditional hours. Smart cataloguing and recommendation engines are effective tools in harnessing semantic discovery beyond Boolean paradigms.

In a nutshell, transformation is more tasking than technology. It thrives on good infrastructure (power broadband), financial commitment, skilled human capital and ethical policy frameworks. The Nigerbiblios and IJIS studies have pronounced these as barriers. To proffer a lasting to the problems identified above, this paper recommends the following: integration of libraries into national AI strategy and funding, coming up with pragmatic approaches to the banes confronting premier universities; investing in connectivity; organizing training for librarians through platforms like NITDA's, 3MTT; liasing with private sector (e.g., CDAL); and giving prior attention to data privacy and ethics frameworks. Librarians must embrace AI enablers guiding research; they must train users and ensure responsible AI governance. This development would foster professional relevance and the AI in a better position to meet the lowering needs of people rather than usurp their responsibilities. Call to action: Nigerian stakeholders; government, academia, and industry must act now. AI-driven libraries are capable of making information to a large audience and boost institutional visibility. The success of this initiative is hinged on sustained cross-sector collaboration and policy foresight. Without these, Nigerian universities would be further plunged into backwardness in the digital era.

Recommendations

1. **Embed AI in National and Institutional Policies**

The 2024 Nigerbiblios study shows that policy frameworks are essential requirements for the instrumentality of the AI in libraries, governance, data privacy and ethical deployment. Therefore, Nigeria's National AI Strategy and Digital Economy Policy should priotise financial backing, regulatory guidance, and oversight for AI implementation in educational libraries. Library management in various institutions should come up with pragmatic approaches to the integration of AI into national policy, infrastructure upgrades and training agendas.

2. **Launch Pilot Programs at Leading Universities**

Strategic pilots at UNILAG, University of Ibadan (UI), and Nile University can justify AI's impact. For example, Nile university Library renamed in 2024 is now described as a "smart, hybrid facility and this makes it an ideal testbed. Pilots should inculcate chats, metadata automation, and preservation tools, with metrics tracking user satisfaction, usage, and staff adoption preparing the stage national implementation.

3. **Invest in Infrastructure and Technology Access**

Research from Ibom E-Library (Uyo) and covenant university enumerates ways through which improved connectivity promotes digital services. Libraries should build on Federal initiatives (E.g CANi) and partner with ISPs, Cisco Interswitch and local tech firms to fastrack reliable broadband, power backups, servers, and modem workstations which constitute the technical backbone for AI systems.

4. **Empower through Skills Development**

Studies (2025) reveals that AI fluency is a sine qua non for librarians to carryout metadata management and pay attention to training datasets. Suggestions in the AULNU communiqué include collaborating with NCAIR for workshops and integrating AI modules into his curricula. Scholarships, webinars and micro credentials possibly subsidized by tech firms can promote capacity building.

5. Cultivate Public-Private Partnerships

Groups like CDIAL and Dataphyte show how private firms can apply AI solutions to local issues. Libraries should endeavor to collaborate with industries through joint Red, pilot grants, and exchange programs. For example, joint efforts in Uyo and convenant university reveal how ciscol/Interswitch partners are effective models.

6. Establish Ethical, Privacy & Sustainability Protocals

AI implementation must be in consonance with data protection and fairness standard. Global best practices, as enumerated by Zondi et al. (2024) and Githes (2025) highlights the role of transparency, consent, and bias audits. Libraries should institute AI internal ethics charters, regularly audit AI outputs, and train staff on ethical AI use in a bid to ameliorate risks and ensure public trust.

References

Adewojo, A. A., Amzat, O. B., & Abiola, H. S. (2025). *AI-powered libraries: Enhancing user experience and efficiency in Nigerian knowledge repositories*. *Library Hi Tech News, 42*(2), 12–16. https://doi.org/10.1108/LHTN-08-2024-0142

Agboke, A. L., & Oladokun, B. D. (2025). *Emerging technologies in academic libraries: Prospects and challenges in Nigeria*. *Communicate: Journal of Library and Information Science, 26*(2), 10–20. Retrieved from https://www.cjolis.org/index.php/cjolis/article/view/110

Achugbue, E. I. (2025). *Artificial intelligence (AI) and the future of academic library services: A study of librarians' AI skills in academic libraries in South-South Nigerian universities*. *NigerBiblios: Journal of National Library of Nigeria, 34*(1), 36–49. Retrieved from https://nigerbiblios.nln.gov.ng/index.php/nigerbiblios/article/view/147

Igbo, H. U., Imo, N. T., Jidere, U. J., & Ugwu, F. N. (2025). *Adopting artificial intelligence in academic library services in Nigeria: Requirements and challenges*. *NigerBiblios: Journal of National Library of Nigeria, 34*(1), 1–18. Retrieved from https://nigerbiblios.nln.gov.ng/index.php/nigerbiblios/article/view/145

Omeluzor, S. U., & Ojukwu, N. N. C. (2025). *Potentials of artificial intelligence (AI) in collection development in university libraries*. *Communicate: Journal of Library and Information Science, 26*(2), 171–181. Retrieved from https://www.cjolis.org/index.php/cjolis/article/view/123

Suleiman, Y., Akanbi, I. M., & Ibidunni, S. A. (2024). *Leveraging artificial intelligence (AI) for library services in Nigerian universities: Ethical consideration and potential benefits*. *International Journal of Intellectual Discourse, 7*(4). Retrieved from https://ijidjournal.org/index.php/ijid/article/view/642

Wagwu, V., Okpala, A. E., Maxwell, C. E., & Oladokun, B. D. (2024). *AI-driven chatbots for library services towards transforming patrons' engagement in Nigerian university libraries*. *Communicate: Journal of Library and Information Science, 26*(1), 89–98. Retrieved from https://www.cjolis.org/index.php/cjolis/article/view/78