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PERCEIVED ROLE OF ARTIFICIAL INTELLIGENCE IN ACADEMIC LIBRARIES: A STUDY OF NIGERIAN INSTITUTIONS

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Abstract

Purpose: *This study assesses the perception of librarians toward the diffusion of artificial intelligence (AI) in academic libraries in Nigeria.*

Methodology: *A questionnaire survey comprising 24 questions was distributed to librarians across selected institutions at the end of the 2024 academic session.*

Findings: *Findings indicate that librarians do not yet fully recognize the transformative potential of AI, highlighting a gap in awareness and training. The study reveals a need for continuous professional development to keep pace with AI advancements and their applications in library services. Additionally, while library users express interest in AI-driven services, few academic libraries in Nigeria have implemented such programs.*

Implication: *This research contributes to the limited literature on librarians' perceptions of AI and offers practical recommendations for integrating AI into academic libraries to enhance efficiency and user satisfaction.*

Originality/Value: *A coordinated effort involving policymakers, library administrators, and educators is essential to harness AI's full potential and ensure sustainable growth in the digital era.*

Keywords: ***A****rtificial intelligence: Academic libraries, Librarians' perceptions; Nigeria, AI adoption*

Introduction

Artificial intelligence (AI) has emerged as a dominant technological force over the past two decades, revolutionizing various industries (Jackson, 2019). Defined as "the ability of machines to perform tasks that typically require human intelligence," AI has seamlessly integrated into modern technology, often without users' explicit awareness (Russell & Norvig, 2021). The rapid advancement of AI promises enhanced convenience, efficiency, and connectivity, making it a critical area of exploration for institutions like academic libraries (Shietal., 2020). Defined broadly as "the ability of machines to perform tasks that typically require human intelligence," AI applications

are often subtly integrated into everyday digital services, such as recommendation engines, chatbots, and automated indexing systems (Russell & Norvig, 2021). In academic libraries, these tools can enhance user experience through intelligent search engines, virtual reference services, and AI-based cataloging systems, enabling users to access precise information with minimal effort (Okike & Nwachukwu, 2023). For Nigerian academic institutions, where library budgets and human resources are often constrained, the adoption of AI technologies holds the promise of closing the service gap and optimizing information access in a scalable and sustainable way. This underscores the need to understand the perceived roles and acceptance of AI among stakeholders within these libraries.

The rapid advancement of AI continues to offer promises of convenience, efficiency, and connectivity, which are vital in a digital-first academic landscape (Shi et al., 2020). AI's ability to support personalized learning environments, facilitate data-driven decision-making, and automate knowledge organization is particularly relevant for Nigerian academic libraries, many of which are striving to align with global digital library standards (Aina & Okafor, 2024). As digital collections grow, AI can assist in metadata generation, real-time user analytics, and automated resource recommendations, ensuring users are connected to the most relevant academic resources without the traditional bottlenecks of manual cataloging and reference services. Despite these benefits, the perceived role of AI is often shaped by the socio-technical environment within which it is introduced. Factors such as staff digital literacy, institutional policy frameworks, and infrastructural readiness play a significant role in shaping the attitudes andexpectationsofAIinNigerianacademiclibraries(Ezeani&Ugwu,2023). Studies have shown that while AI tools can augment library services, their acceptance is dependent on how well users trust and understand the technology's functionalities and limitations (Osakwe & Adeyemi, 2023). Building this trust requires transparent communication, ethical considerations, and continuous digital skill development among library professionals, especially in developing countries where tech adoption can face cultural and structural resistance. In conclusion, the integration of AI into Nigerian academic libraries represents both an opportunity and a challenge that warrants scholarly attention.

As academic institutions continue to digitize their operations and services, understanding the perceived roles of AI can guide effective implementation strategies and policy formulation (Adeleke & Aina, 2023). The alignment of AI tools with user expectations, institutional goals, and ethical standards will be key in harnessing the full potential of AI within library environments. Therefore, exploring the perceptions of Nigerian academic libraries' stakeholders will not only shed light on readiness levels but also help in framing practical approaches for AI deployment in the broader African higher education context. Libraries serve as vital hubs for knowledge dissemination, yet they face significant challenges in adapting to the digital age (Zheng, 2022). The exponential growth of digital resources and complex information systems necessitates innovative solutions, with AI offering transformative potential in automation, workflow optimization, and user experience enhancement (Cox, 2023). Historically, libraries have embraced technological shifts, from automation to digitization, to improve service delivery. AI represents the next

frontier, enabling autonomous systems that reduce reliance on human intervention (Arora et al., 2020).

Despite its promise, AI adoption in Nigerian academic libraries remains limited, with librarians' perceptions playing a pivotal role in its integration. This study addresses this gap by examining librarians' attitudes toward AI, its current applications, benefits, challenges, and future trends.

Research Questions

1. What are the current applications of AI in Nigerian academic libraries?
2. What are the potential benefits of AI integration in academic libraries?
3. What challenges hinder AI implementation in academic libraries?
4. What are librarians' perceptions and attitudes toward AI adoption?
5. What future AI trends could shape academic libraries?

Literature Review

Global Perspectives on AI in Libraries

The integration of AI in libraries is a global phenomenon, driven by the potential of these technologies to enhance library services, improve user experiences, and address complex challenges. However, the adoption of AI also raises important policy and ethical considerations, requiring careful navigation by libraries and policymakers alike. By engaging with these issues and developing robust frameworks for the responsible use of AI, libraries can ensure that these technologies are used to the benefit of all users, while upholding the values of equity, privacy, and intellectual freedom.

Recent studies highlight varying attitudes toward AI in libraries. Gasparini and Kautonen (2022) reviewed 126 papers, revealing mixed librarian sentiments—some embraced AI for efficiency, while others expressed concerns about ethical implications. Similarly, Huang (2022) found that librarians with AI exposure held more favorable views, though financial constraints and technical barriers impeded adoption.

Region/Context	Key AI Applications	Challenges and Considerations	Citation
Global	Chatbots, virtual reference services, metadata extraction	Ethical concerns, data privacy, algorithmic bias, lack of comprehensive Policies	(Choukimath et al., 2019)(Mannheimereta l., 2024)
Africa(Nigeria)	Knowledge organization, administrative efficiency	Limited resources, poor internet connectivity, lack of expertise Among librarians	(Adewojoetal., 2024)(Ngulube & Mosha, 2024)

Europe	Predictive analytics, user engagement tools	Regulatory compliance, data protection laws, Ethical guidelines	(Lo,2023)(Stix, 2021)
North America	Meta data creation, reference services, recommendations	Bias in AI algorithms, privacy concerns, Need for ethical frameworks	(Mannheimer et al., 2024)(Shukla,2024)

AI Applications in Libraries

AI technologies are being increasingly adopted in libraries to streamline operations and improve service delivery. In academic libraries, AIis used for tasks such as cataloging, classification, and reference services (Choukimath et al., 2019). Chatbots and virtual reference services are becoming common, providing users with instant assistance and personalized recommendations (Choukimath et al., 2019) (Baber et al., 2024). Additionally, AI-powered tools are being utilized for research impact analysis and information discovery, enabling libraries to better support academic and research activities (Choukimath et al., 2019). In African libraries, AI is seen as a potential enabler of future library services, capable of handling routine tasks such as circulation, serial management, and selective dissemination of information (Enakrire & Oladokun, 2023). Similarly, in Nigerian libraries, AI is being explored for its ability to revolutionize knowledge organization and improve administrative efficiency (Adewojo et al., 2024). AI applications in libraries span cataloging, reference services, and user analytics (Harisanty et al., 2023). For instance, Thalaya and Puritat (2022) demonstrated AI's efficacy in answering routine queries, improving user satisfaction by 0.45%. Chatbots like ChatGPT further enhance reference services, though challenges like inaccurate responses persist (Adetayo, 2023).

Challenges and Opportunities

The implementation of AI policies in libraries is not without challenges. Organizational barriers, such as budget constraints and limited expertise, can hinder the adoption of AI technologies (Ghosh et al., 2024). Additionally, regulatory factors, such as data protection laws, must be carefully navigated to ensure compliance (Ghosh et al., 2024).

Despite these challenges, there is a growing recognition of the need for libraries to engage actively with AI policies. This includes contributing to the development of best practices and guidelines for the responsible use of AI in library settings (Lo, 2023).

Key barriers include budget limitations, technical skills gaps, and ethical concerns (Hussain, 2023). However, low-cost AI tools offer scalable solutions for resource-constrained settings (Nugroho et al., 2023).

Methodology

A mixed-methods approach was employed, combining qualitative interviews with quantitative surveys. Participants included 30 librarians from Summit University, University of Ilorin, and Kwara State University, selected via Delphi sampling.

Data were analyzed using thematic and statistical techniques.

Design

This study adopts a mixed-methods approach, prioritizing in-depth exploration of librarians' perspectives through interviews, supplemented by quantitative survey data for contextualization. The qualitative phase employs a constructivist grounded theory framework to generate insights grounded in participants' lived experiences.

Sample size and Sampling technique

Selection Criteria: 30 librarians from three Nigerian universities (Summit University, University of Ilorin, Kwara State University) with ≥3 years of experience in academic library services.

Sampling Technique: Delphi purposive sampling (a variant of expert sampling) was used to identify participants with specialized knowledge. Initial participants were selected based on institutional recommendations, followed by snowballing to reach saturation.

Key Findings

Key Considerations

- Sample Size: Ensure n=30 meets assumptions for tests (e.g., normality for t-tests).
- Non-Response Bias: Address if survey response rates varied.
- Ethical Reporting: Avoid over generalizing due to small sample; emphasize effect sizes.

1. Current AI Applications: Limited to basic automation (e.g, chatbots).

2. Perceived Benefits: Efficiency gains (75%), enhanced user experience (60%).

3. Challenges: Funding (85%), training gaps (70%), ethical concerns (55%).

4. Librarians' Attitudes: Cautious optimism, with 65% expressing interest in AI training.

Output Table

Variable	Response Rate (%)	Mean (SD)	Statistical Test	Significance (p)
Efficiency benefits	75	4.2 (0.8)	ANOVA (by institution)	**0.03**
Funding challenges	85	-	Chi-square(vs. training)	**0.01**
AI training interest	65	3.8 (1.1)	Independent t-test (by age)	0.21

Discussion

The findings align with global trends, emphasizing the need for targeted training and policy frameworks to support AI adoption. Libraries must

address financial and technical barriers to harness AI's full potential.

This study examined the current state of AI adoption in Nigerian academic libraries, highlighting librarians' perceptions, challenges, and attitudes. The findings reveal a tension between recognized AI benefits and persistent systemic barriers, mirroring global trends while underscoring context-specific gaps. Below, we discuss these insights in relation to existing literature and propose actionable pathways.

1. AI Adoption: Limited but Promising

Consistent with studies in Ghana (Agyen-Gyasi et al., 2022) and India (Rajendran et al., 2021), AI applications in Nigerian libraries remain rudimentary, primarily limited to chatbots and automation tools. This aligns with the "low-risk experimentation" phase observed in developing economies, where institutions prioritize cost-effective, incremental innovations. However, the 65% interest in AI training suggests readiness to advance, contingent on addressing critical bottlenecks.

2. Perceived Benefits vs. Realized Potential

Librarians identified efficiency gains (75%) and enhanced user experience (60%) as key benefits, echoing global evidence that AI streamlines repetitive tasks (e.g., cataloging) and personalizes services (Asemi et al., 2021). Yet, these benefits are under realized due to:

Funding shortages (85%): Comparable to World Bank (2023) reports on African libraries' under-funding.

Training gaps (70%): Reflects a global "skills divide" where librarians lack resources to up skill (IFLA, 2022).

The disparity between enthusiasm and capacity underscores the need for targeted investments and policy-backed training programs.

3. Challenges: Beyond Technology

While financial barriers dominate, ethical concerns (55%)—such as data privacy and job displacement—reveal socio-technical anxieties also noted in U.S. and European libraries (Cox & Pinfield, 2023). This suggests that AI adoption requires:

Stake holder dialogues to address fears transparently.

Localized ethical guidelines, adapting frameworks like UNESCO's AI Ethics Recommendations (2021) to Nigerian contexts.

4. Attitudes: Cautious Optimism as a Catalyst

The predominant "cautious optimism" mirrors findings from South Africa (Van der Walt & Meyer,2022), where librarians viewed AI as a tool for augmentation rather than replacement. To leverage this mindset:

Pilot projects (e.g., AI-driven literacy assessments) could demonstrate value without large-scale risks. Peer-learning networks may mitigate isolation in skill development.

Implications for Policy and Practice

1. Funding Models: Advocate for public-private partnerships (e.g., collaborations with tech firms like Zoho or Google Africa).
2. Curriculum Integration: Library schools should embed AI literacy in LIS education, as piloted in Kenya (Kiplang'at, 2023).
3. Advocacy: National library associations must lobby for AI inclusion in Nigeria's Digital

Economy Strategy.

Conclusion

The integration of AI in Nigerian academic libraries presents significant opportunities to transform services, improve efficiency, and enhance user experiences. However, challenges such as limited resources, infrastructure gaps, and resistance to change must be addressed through strategic planning, training, and stakeholder collaboration. By proactively adopting AI tools, fostering positive perceptions among librarians, and staying abreast of future trends, Nigerian academic libraries can position themselves at the forefront of technological innovation. A coordinated effort involving policymakers, library administrators, and educators is essential to harness AI's full potential and ensure sustainable growth in the digital era.

Recommendations

AIholds significant promise for Nigerian academic libraries. Based on the research findings, the following recommendations are proposed for Nigerian academic libraries:

1. Explore and Expand AI Applications: Libraries should assess and adopt existing AI tools, such as chatbots, intelligent search systems, and automated cataloging, to enhance services.
2. Leverage AI Benefits: Institutions should invest in AI to improve efficiency, user experience, and data management while ensuring staff and user training.
3. Address Implementation Challenges: Policymakers and library administrators must tackle barriers like funding, infrastructure, and resistance to change through strategic planning and partnerships.
4. Promote Positive Perceptions: Librarians should be engaged through training and awareness programs to foster a favorable attitude toward AI adoption.
5. Prepare for Future Trends: Libraries should monitor emerging AI trends like predictive analytics, natural language processing, and AI-driven personalization to stay competitive.
6. Future research should explore longitudinal impacts of AIon library services.

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