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AWARENESS, ACCESSIBILITY AND UTILIZATION OF ARTIFICIAL INTELLIGENCE IN ACADEMIC LIBRARIES IN KEBBI STATE

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Abstract:

The aim of this research is to identify the awareness, availability, and use of Artificial Intelligence (AI) technologies among Academic librarians in Kebbi State, Nigeria. A quantitative survey design was employed to select 100 librarians drawn from university libraries including Kebbi State University of Science and Technology Aliero, Federal University Birnin Kebbi, Federal University of Agriculture Zuru and Rayhan University Birnin Kebbi from a randomly sample of four purposively chosen university libraries A structured questionnaire will be used as the research instrument, its validity was ensured through expert review for content validity and a pilot test of 10 respondents for face validity. Results indicate low awareness levels of AI in general, lack of access to AI tools, and low use of AI technologies for library services. Job loss, inadequate training, substandard infrastructure, and insufficient funding were some of the challenges highlighted Despite these constraints, respondents acknowledge the capability of AI to revolutionize library services and user satisfaction. In view of the above findings the study therefore recommends special capacity-building initiatives, increased investment in AI infrastructure, and development of enabling policies to facilitate the application of AI in academic libraries. These initiatives are aimed at making Kebbi State libraries align with international technological progress and meet evolving user needs in the information age.

Keywords: Artificial intelligence, Academic libraries, Technologies, Accessibility & Kebbi State

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Introduction:

Artificial Intelligence (AI) has become increasingly prevalent in academic libraries, transforming traditional services and enhancing user experiences. In Nigeria, academic librarians are aware of AI's existence and its potential to improve library operations, although concerns about job security persist (Abayomi et al., 2021). This awareness is crucial as AI technologies can significantly enhance accessibility for users with disabilities, offering tools such as voice recognition and AI-powered search systems (Kishore et al., 2024). The integration of AI in academic libraries is not limited to developed countries; it is also gaining traction in developing nations like India and Zambia (Alam et al., 2024; Kalbande et al., 2024). The utilization of AI in academic libraries spans various applications, from automating routine tasks to improving search and discovery mechanisms (Senthilkumar et al., 2024). AI-driven chatbots and virtual assistants provide instant user support, while text and data mining techniques enable advanced research capabilities. In the context of library instruction, AI-based applications can enhance the effectiveness and efficiency of virtual services, supporting research consultations, designing instructional materials, and conducting program evaluations (Anna et al., 2023). However, the adoption of AI technologies in libraries faces challenges such as the need for enhanced AI expertise, resistance to change, and budgetary constraints (Alam et al., 2024).

The perception of AI among academic librarians is generally positive, with recognition of its potential to bridge performance gaps and improve library services (Kalbande et al., 2024). However, there is a need for balanced, informed, and ethical use of AI tools in higher education settings (Zhou et al., 2024). Ethical considerations, including user privacy, bias, discrimination, and transparency, are significant concerns that need to be addressed (Chemnad & Othman, 2024; Subaveerapandiyan & Gozali, 2024). As AI continues to shape the future of academic libraries, it is crucial for librarians to acquire the necessary skills and understanding to effectively integrate these technologies while maintaining the human touch in library services (Abayomi et al., 2021; Manoharan et al., 2024).

Literature review:

Artificial Intelligence (AI) has emerged as a transformative force across various sectors, including education, healthcare, and geohazard prevention. In education, AI technologies have shown promise in enhancing teaching, learning, and assessment processes, with applications ranging from intelligent tutoring systems to performance prediction tools (Bali, 2024; Kumar et al., 2023). The healthcare sector has witnessed significant advancements in AI applications, particularly in areas such as ophthalmology, cardiology, and spine care. AI algorithms have demonstrated high accuracy in diagnosing conditions like myocarditis and corneal diseases, as well as predicting patient outcomes (Hornung et al., 2022; Łajczak & Jóźwik, 2024; Tey et al., 2024). In the field of geohazard prevention, AI techniques have been employed to address complex challenges, with deep learning, support vector machines, and decision trees being commonly used algorithms (Jiang et al., 2022). Despite the potential benefits, the integration of AI in these domains faces challenges such as ethical considerations, privacy concerns, and

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the need for effective human-AI collaboration (Kumar et al., 2023; Taherdoost & Madanchian, 2023). As AI continues to evolve, it is crucial for practitioners and researchers to stay informed about its developments and potential impacts. The future of AI in these fields looks promising, with opportunities for more personalized and efficient approaches in education, healthcare, and environmental risk management (Ghosh et al., 2024; Rashid & Kausik, 2024; Rodríguez et al., 2022).

Artificial intelligence (AI) is emerging as a transformative technology in libraries, offering numerous applications to enhance services and operations. AI technologies, including expert systems, natural language processing, and machine learning, are being integrated into various library functions such as cataloging, personalization, predictive analysis, and reference services (Amzat & Adewojo, 2023; Omame & Alex-Nmecha, 2020; Oyelude, 2021). These AI-driven solutions improve content indexing, document matching, content mapping, and summarization, ultimately enhancing the user experience and library efficiency (Oyelude, 2021). The integration of AI with the metaverse presents opportunities for creating immersive, personalized learning environments and fostering global collaboration in academic libraries (Amzat & Adewojo, 2023). However, the adoption of AI in libraries faces challenges, particularly in developing countries, where issues such as lack of infrastructure, shortage of skilled personnel, and high implementation costs pose significant barriers (Barsha & Munshi, 2023). Despite these challenges, AI has the potential to revolutionize library services, offering smart recommendations tailored to user needs and opening up new horizons for information access and service delivery (Barsha & Munshi, 2023; Jha, 2023). As libraries continue to evolve in the digital age, AI is expected to play a crucial role in maintaining their relevance and enhancing their capabilities to meet the changing needs of users in an increasingly technology-driven society (Omame & Alex-Nmecha, 2020; Oyetola et al., 2023)

Awareness of Artificial Intelligence (AI) in libraries varies across different regions and types of institutions. In developed countries, there is a growing presence of AI in university libraries, with academic librarians being aware of its existence and potential benefits (Abayomi et al., 2021). Similarly, Indian library professionals demonstrate general awareness of AI and its potential to enhance library activities, improve accessibility, and support decisionmaking (Subaveerapandiyan & Gozali, 2024). In Nigeria, academic librarians are aware of AI integration in libraries globally, but its adoption in the Nigerian context is limited (Ajani et al., 2022). Zambian librarians show a solid understanding of AI fundamentals and positive attitudes towards its potential benefits in library services (Alam et al., 2024).

However, there are contradictions and challenges in AI awareness and adoption. While librarians recognize AI's potential to improve efficiency and user satisfaction, there is a fear of job loss among some professionals (Abayomi et al., 2021; Ajani et al., 2022). The level of AI literacy and implementation varies, with large academic libraries being more likely to adopt AI technologies (Mannheimer et al., 2024). Ethical concerns, including bias, discrimination, and privacy issues, are significant considerations in AI implementation (Mannheimer et al., 2024; Subaveerapandiyan & Gozali, 2024). Despite the growing awareness, many libraries, particularly in developing countries, face challenges such as funding constraints, inadequate expertise, and limited infrastructure, which hinder the adoption of AI technologies (Ajani et al.,

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2022; Alam et al., 2024). Overall, while there is a general awareness of AI's potential in libraries, the actual implementation and readiness for AI integration vary significantly across different regions and types of libraries.

The integration of Artificial Intelligence (AI) in libraries presents significant opportunities for enhancing accessibility, particularly for users with disabilities. AI technologies such as voice recognition, text-to-speech, and AI-powered search and recommendation systems can greatly improve the accessibility of library resources for individuals with visual, auditory, and mobility impairments (Kishore et al., 2024). These AI-driven tools have the potential to create personalized, immersive, and accessible user experiences, redefining the traditional concept of libraries (Amzat & Adewojo, 2023). For instance, AI can enable efficient resource management, global collaboration, and personalized learning paths, thereby enhancing the overall accessibility and inclusivity of library services (Amzat & Adewojo, 2023; Chemnad & Othman, 2024).

Nevertheless, the implementation of AI in libraries, especially in developing countries, faces several challenges. These include the lack of infrastructure and resources, shortage of skilled personnel, absence of data privacy regulations, digital divide, and high costs associated with implementing AI-based solutions (Barsha & Munshi, 2023). Moreover, there is a critical gap in addressing the needs of individuals with speech and hearing impairments, autism spectrum disorder, neurological disorders, and motor impairments in AI-driven digital accessibility research (Chemnad & Othman, 2024). To overcome these challenges, partnerships between libraries and technology firms, investment in infrastructure and resources, training and capacity building for library staff, and the development of regulatory frameworks to protect user data are recommended (Barsha & Munshi, 2023). Additionally, there is a need for a more balanced research distribution to ensure equitable support for all communities with disabilities and adherence to accessibility standards in existing systems (Chemnad & Othman, 2024).

Artificial intelligence (AI) has become increasingly crucial in library management and operations, offering numerous benefits and transforming traditional library services. AI technologies are being utilized in various aspects of library functions, including cataloging, indexing, information retrieval, reference services, and decision-making processes (Abdulwahid et al., 2023; Gürsen et al., 2023). The integration of AI in libraries has led to improved accuracy and efficiency in data management, enhanced user experiences, and potential cost savings (Bisht et al., 2023). AI-driven virtual assistants, personalized learning paths, and collaborative environments are being envisioned as part of metaverse-infused academic libraries, promising to redefine the concept of library services (Amzat & Adewojo, 2023). Additionally, generative AI is shaping how higher education students access and use library resources, potentially offering enhanced discovery, personalization, and streamlined research processes (Meakin, 2024).

Despite the growing adoption of AI in libraries, challenges and ethical concerns persist. The implementation of AI in libraries raises questions about data privacy, algorithmic bias, and the digital divide (Amzat & Adewojo, 2023; Mannheimer et al., 2024). There is also a need for libraries to address issues related to transparency, reliability, social justice, and user consent

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when implementing AI technologies (Mannheimer et al., 2024). The fear of job loss among librarians is a significant constraint in AI adoption, although there is recognition that these technologies can lead to more efficient user satisfaction (Abayomi et al., 2021). As AI becomes more prevalent in library settings, it is crucial for librarians to acquire the necessary skills to remain relevant in the era of the fourth industrial revolution and to understand that AI adoption does not necessarily translate to job losses (Abayomi et al., 2021). The successful implementation of AI in libraries requires a balance between leveraging its benefits and addressing the associated ethical and practical challenges.

Objectives:

The study on Awareness, Accessibility, and Utilization of Artificial Intelligence in Academic Libraries in Kebbi State aims to achieve the following objectives:

1. To assess the level of awareness of artificial intelligence (AI) technologies among academic library staff and users in Kebbi State.
2. To examine the accessibility of AI tools and resources in academic libraries within Kebbi State.
3. To evaluate the extent of AI utilization in library operations and services in academic institutions.
4. To identify the challenges and prospects of adopting AI in academic libraries in Kebbi State.

Research Questions:

The study will be guided by the following research questions:

1. What is the level of awareness of AI technologies among academic library staff and users in Kebbi State?
2. How accessible are AI tools and resources in academic libraries within Kebbi State?
3. To what extent are AI technologies utilized in academic library services and operations?
4. What are the challenges and opportunities in adopting AI in academic libraries in Kebbi State?

Methodology:

Quantitative method was used to assess the awareness, accessibility, and utilization of Artificial Intelligence (AI) by academic librarians in Kebbi State. The choice of this method provide measurable and statistically analyzable data. This approach allows for the collection of numerical data that can be used to quantify attitudes, opinions, and behaviors related to AI adoption in libraries (Ferikoğlu & Akgün, 2022; Kusmaryono et al., 2022). According to Oyodonga and Dime (2020) this is method of data collection using questionnaire or interview to collect data from a sample that has been selected to represent population to which the findings to the data analysis can be categorized. The target population of the study was academic librarian from public universities in Kebbi State. There are three public universities in Kebbi State i.e Kebbi State University of Science and Technology Aliero, Federal University Birnin Kebbi and Federal University of Agriculture Zuru. The purposive sampling which ensures that participants have relevant knowledge and experience in library and information

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science was used to select the sample size of 100 constituting librarians drawn from the all the 3 university libraries selected for the study. Questionnaires were administered to all 100 librarians with 100% were retrieved. The use of a 5-point Likert scale for data collection is justified by its widespread use and effectiveness in measuring attitudes and perceptions (Hussain & Rafiq, 2023; Kusmaryono et al., 2022). This scale provides a balanced range of response options, allowing respondents to express their level of agreement or disagreement with statements related to AI awareness, accessibility, and utilization. For data analysis and presentation, the use of SPSS (Statistical Package for Social Sciences) is welljustified, as it is a powerful tool for conducting statistical analyses on quantitative data (Hussain & Rafiq, 2023; Khan et al., 2023). SPSS can be used to perform descriptive statistics, correlation analyses, and regression tests, providing insights into relationships between variables and identifying significant factors influencing AI adoption in libraries. The use of tables for data presentation is an effective way to summarize and display results clearly and concisely, making it easier for readers to interpret the findings (Ali et al., 2024; Rowlands et al., 2007). This approach to data analysis and presentation allows for a comprehensive examination of the research questions and facilitates the identification of trends and patterns in AI awareness, accessibility, and utilization among academic librarians in Kebbi State **Results:**

The reason for this research of study is to explored the awareness, availability, and use of Artificial Intelligence (AI) technologies among Academic librarians in public university libraries in kebbi state. Data was collected through questionnaire which was administered respondents and 100% was returned. The data was analysed using software and the is represented in tabular form below. In 5- point Likert scale 0.01-2.49 is rejected and 2.50-5.00 is accepted and the criterion mean is 2.50.

Research Question 1: What is the level of awareness of AI technologies among academic library staff and users in Kebbi State?

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
I am familiar with AI technologies and their applications in academic libraries.	20%	25%	30%	15%	10%	2.7
Library staff and users have received formal education or	30%	35%	20%	10%	5%	2.3

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Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
training on AI applications in libraries.						
AI-related information is readily available within the library system.	25%	30%	25%	15%	5%	2.5
I have personally used AI-powered tools in academic research or library services.	35%	30%	20%	10%	5%	2.2
AI is frequently discussed as part of the library's future development strategies.	30%	30%	20%	15%	5%	2.4

Interpretation:

Based on the aggregate mean score of 2.42 and a criterion mean of 2.50, the overall level of awareness of AI technologies among academic library staff and users in Kebbi State is considered low. While the statement "I am familiar with AI technologies and their applications in academic libraries" recorded a mean score of 2.7—indicating a moderate level of individual familiarity—most other items fell below the criterion threshold. Specifically, the statements regarding formal education or training on AI (2.3), personal use of AI tools in research or library services (2.2), and discussions of AI in future library strategies (2.4) all reflect insufficient awareness and engagement. The statement about the availability of AI-related information within the library system scored exactly 2.5, suggesting marginal adequacy but not strong presence. Collectively, these findings suggest that while there may be some individual understanding of AI, institutional exposure, training, and strategic integration remain limited. This underscores the urgent need for targeted educational initiatives, increased access to AI tools and information, and the development of clear policies to enhance AI awareness and utilization in academic library environments within Kebbi State.

Research Question 2: How accessible are AI tools and resources in academic libraries within Kebbi State?

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean

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Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
AI-powered tools (e.g., chatbots, recommendation systems) are available in the library.	40%	30%	15%	10%	5%	2.1
Library users can easily access AI-based research assistance tools.	35%	30%	20%	10%	5%	2.2
The library provides sufficient internet and technological infrastructure to support AI usage.	30%	30%	25%	10%	5%	2.3
The library has a well-defined policy for AI adoption and implementation.	45%	25%	15%	10%	5%	2.1
AI resources are integrated into academic databases and digital library services.	40%	30%	15%	10%	5%	2.2

Interpretation:

With reference to the criterion mean of 2.50 and an aggregate mean score of **2.18**, the accessibility of AI tools and resources in academic libraries within Kebbi State is notably low. The mean scores for individual items are as follows: availability of AI-powered tools (2.1), ease of access to AI-based research tools (2.2), availability of sufficient internet and technological infrastructure (2.3), existence of a well-defined AI adoption policy (2.1), and integration of AI resources into academic databases (2.2). All these scores fall below the criterion mean, indicating that respondents largely perceive AI tools, supporting infrastructure, and strategic frameworks as lacking or inadequate. This reflects a systemic gap in AI accessibility and highlights the urgent need for institutional investment in AI infrastructure, development of clear implementation policies, and improved user access to AI-driven library services

Research Question 3: To what extent are AI technologies utilized in academic library services and operations?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

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Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
AI is actively used for cataloging and classification of library materials.	50%	25%	15%	7%	3%	1.9
AI tools help in answering user queries efficiently.	45%	30%	15%	7%	3%	2.0
AI-powered systems are used for plagiarism detection and research support.	40%	30%	20%	7%	3%	2.1
The library management system incorporates AI for book recommendations and automated check-ins.	50%	30%	10%	7%	3%	1.9
AI is used in analyzing user behavior to improve library services.	45%	30%	15%	7%	3%	2.0

Interpretation:

Going pegged by criterion mean of 2.50 and an aggregate mean score of 1.98, the utilization of AI technologies in academic library services and operations within Kebbi State is very low. The mean scores for each item are as follows: AI use in cataloging and classification (1.9), answering user queries (2.0), plagiarism detection and research support (2.1), book recommendations and automated check-ins (1.9), and analyzing user behavior (2.0). All scores fall significantly below the criterion mean, indicating minimal integration of AI in core library functions. This underscores the critical need for academic libraries in the state to adopt AI tools to enhance operational efficiency and user experience.

Research Question 4: What are the challenges and opportunities in adopting AI in academic libraries in Kebbi State?

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly

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Statement	Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
Lack of funding is a major challenge in implementing AI in academic libraries.	10%	15%	20%	30%	25%	3.5
There is resistance to adopting AI among library staff and users.	15%	20%	25%	25%	15%	3.0
AI can enhance library services by improving efficiency and user experience.	5%	10%	20%	30%	35%	3.8
Training and capacity building are necessary for effective AI integration in libraries.	5%	10%	15%	30%	40%	3.9
AI-driven library services can significantly improve information retrieval and research outcomes.	5%	10%	15%	35%	35%	3.9

Interpretation:

Based on the criterion mean of 2.50 and an aggregate mean score of 3.62, the responses indicate a strong recognition of both the challenges and opportunities associated with adopting AI in academic libraries within Kebbi State. The mean scores for individual statements are: lack of funding (3.5), resistance to adoption (3.0), AI's potential to enhance services (3.8), the need for training and capacity building (3.9), and AI's role in improving information retrieval and research outcomes (3.9). All scores are well above the criterion mean, showing that respondents clearly acknowledge funding and resistance as challenges, while also expressing strong agreement on the opportunities and benefits of AI when properly supported by training and infrastructure.

Findings:

The study investigated the awareness, availability and use of artificial intelligence technologies in academic libraries with 3 selected academic libraries as target of the study. The results revealed as follows: The finding shows a low level of awareness of AI technologies among academic library staff and users in Kebbi State. This aligns with findings by Onifade et al. (2021), who reported that academic librarians in Nigerian universities had limited knowledge

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Statement	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean

of AI applications, citing a lack of training and exposure. Which implies a pressing need for structured awareness programs and formal training to build foundational knowledge, without which effective AI adoption cannot occur. The study reveals poor accessibility to AI tools and infrastructure in academic libraries, as reflected in the low. This finding is consistent with Owolabi and Okunlola (2022), who found that most Nigerian university libraries lack AIpowered systems due to funding constraints, inadequate ICT infrastructure, and policy gaps. This suggests the need for significant investment in AI resources, internet infrastructure, and policy development to make AI tools practically available and usable.

The findings indicate that AI technologies are scarcely utilized in library operations, such as cataloging, research support, and user engagement. This is in agreement with Acheampong and Boateng (2021)**,** who found that many academic libraries in West Africa still rely on traditional cataloging, classification, and reference services due to a lack of AI-trained

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professionals. This highlights the need for practical integration strategies, including pilot projects and training, to demonstrate and implement AI solutions effectively

The finding indicates strong awareness of both the challenges related to AI adoption in academic libraries. The study found that funding constraints, lack of training, and resistance to change are major challenges in AI adoption**.** This aligns with Eze and Chukwu (2022)**,** who found that African academic libraries struggle with limited budgets and policy frameworks that hinder AI integration. This suggests that while funding and resistance are concerns, stakeholders recognize AI's potential, creating a timely opportunity for strategic investment, policy development, and capacity building.

Conclusion:

The study reveals that AI awareness, accessibility, and utilization in academic libraries in Kebbi State remain low, primarily due to lack of training, inadequate infrastructure, and funding constraints. However, there is strong recognition of AI's potential benefits**,** particularly in enhancing efficiency and research support. In order to bridge the gap between developing and advanced regions, libraries must prioritize AI education, policy formulation, and investment in digital infrastructure. Addressing these challenges will pave the way for effective AI adoption, improving library services and research outcomes in the long run.

Recommendations:

Based on the findings of the study and in order to improve AI adoption by librarians in Kebbi State University libraries the following recommendations are offered.

1. Managers, librarians, professional bodies and other relevant stakeholders should increase AI Awareness and Training through organize workshops, seminars, and certification programs for library staff and users to enhance their understanding of AI applications in academic libraries.
2. Government, institution and other sponsors should allocate more funding in the area of artificial intelligence i.e in AI-powered library management systems, internet connectivity, and digital tools to facilitate seamless AI integration in library operations.
3. Stakeholders should establish clear policies and guidelines for AI implementation in academic libraries, ensuring structured integration and sustainability.
4. Collaborate with government agencies, private organizations, and international institutions to secure funding for AI adoption and capacity-building initiatives in academic libraries.

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