Journal of Research in Vocational Education ISSN: 2408-5170
DOI: 10.53469/jrve.2025.7(10).01

Academic Librarians' Technological Readiness: Phenomenographic Study of AI Adoption Barriers

Okita Dan Odhiambo

CLN, Lovely Professional University, Phagwara, India
odhiambo@gmail.com

Abstract: ***This study investigates Artificial Intelligence in North Eastern Nigerian University Libraries: Librarian Perceptions and Challenges. The study was guided by two objectives, two research questions, and one hypothesis, it employed a descriptive survey design, targeting professional librarians across state and federal universities. Data were collected via a Google Form questionnaire on a 4-point Likert scale, distributed through WhatsApp networks, and analyzed using mean, standard deviation, and Pearson Chi-square tests (SPSS v23.0). Findings reveal a moderate perception of AI's potential to enhance services, reduce repetitive tasks, and boost productivity, though significant challenges like funding and infrastructure persist. The hypothesis test confirmed that librarians' perceptions significantly influence library services.***

Keywords: Artificial Intelligence, Librarians, Perception, Challenges, University Libraries

1.Introduction

The primary duties of librarians are library and information services, which offer unrestricted access to vital resources for growth in research, education, the economy, and culture. The purpose of libraries' construction and upkeep is to supply information resources. Through the individual efforts of library staff, library services bridge the barriers between people, information, and technology by bringing together users and documents or information sources. The emergence of information and communication technology (ICT) in the 21st century has affected every sphere of society, including libraries. Since most library patrons are digital citizens leveraging technology to access and retrieve up-to-date and pertinent information for their daily academic activities, libraries, as educational institutions, have embraced every emerging technology for effective and efficient services. Adopting new technologies becomes essential if libraries and librarians want to remain relevant in today's information technology-driven society. Artificial intelligence (AI) represents a pivotal technological advancement in recent years.

Artificial intelligence refers to the ability of machines, particularly computer systems, to simulate human intelligence processes. Expert systems, natural language processing, speech recognition, and machine vision are some specific uses of artificial intelligence. AI might help libraries improve and broaden their offerings while highlighting their value in the modern digital world. The application of AI in libraries can be viewed as the result of several cutting-edge technological developments that have enabled libraries to have access to machines that can observe, understand, act, and learn, according to Owolabi et al. (2022). According to studies, academic libraries in industrialised nations have subsequently adopted artificial intelligence (AI) into their operations and services. According to Cox (2023), chatbots or conversational agents have been suggested as a beneficial tool for library work for almost a decade; similar assertions are currently being made to adapt voice assistants for usage in a library setting.

As important library stakeholders, librarians have varying opinions about the new technology. This is due to the fact that librarians have differing views and attitudes about the acceptance of integrating AI into library and information services. According to Okunlaya et al. (2022), librarians are aware of AI's potential to enable more individualised interactions with library patrons. They added that AI-powered chatbots and virtual assistants can provide real-time support by responding to frequently asked questions and directing users to resources, improving the user experience overall. According to Omame and Alex-Nmecha (2020), some libraries think AI will help them deliver faster and more precise search results, which would eventually increase user engagement and satisfaction. According to Sambo and Oyovwe-Tinuoye (2023), the majority of Nigerian Certified Librarians believed AI may improve library services, boost international recognition, and result in staff layoffs. While Eiriemiokhale and Sulyman (2023) demonstrated that librarians believed AI technologies could be adopted in university libraries, that they could eventually replace human librarians, and that AI was a positive development for librarians, Owolabi, Adenekan, Adeleke, Ajayi, and Adesina (2021) reported that librarians acknowledged that adopting AI in university libraries could result in job loss, make the libraries more relevant in the academic community, and improve academic librarians' job performance.

Notwithstanding these differences in librarian perception, adoption and integration of AI technology into library and information services are hampered by certain issues. Lack of money and a tight budget to buy the technology, insufficient knowledge and abilities, an epileptic power supply, poor internet services, and low bandwidth are a few of these difficulties. According to Ajani, Tella, Salawu, and Abdullahi (2022), the obstacles that could prevent the integration of technology into library operations and services include a lack of funding, a shortage of experts, a limited power supply, a limited budget for purchasing the technology, and the need to train staff who may be responsible for system maintenance. High maintenance risk, poor internet service delivery, technical issues, epileptic

electricity or power supply, inadequate ICT facilities for AI technologies, a lack of artificial intelligence equipment, and a lack of parent institution funding were all identified by Isiaka, Olarongbe, Sulyman, Aremu, and Saba-Jibril (2024). The findings of Ahmed, Aliyu, and Ayandokun (2023) included inadequate IT/Artificial Intelligence infrastructure, inconsistent/poor power supply, poor interdisciplinary collaboration among professionals, such as computer scientists and library educators, high costs associated with using AI applications, a lack of a vision and strategy to justify the use of AI applications in education, a lack of institutional/management policy on AI, a shortage of college specialists/experts in applying AI techniques, and a lack of proficiency with AI technology.

2.Statement of Problem

The deployment of Artificial intelligence in libraries is meant to revolutionize library and information services resulting in efficient and effective service delivery to the users. The librarians as key stakeholders must perceive the technology as a positive tool geared towards improved library and information services, ease their duties by eliminating repetitive tasks, facilitate discovery of new knowledge, become better at tasks that used to require human intelligence, improving the academic performance of the users help satisfy users' information needs without difficulty as well as enhance libraries and librarians' productivity. Tella (2020) stressed the need for librarians to re-position themselves to take relative advantage of artificial intelligence's potentials by refining the quality of library services in this era of the information age. However, preliminary investigation by the researchers as well as various studies consulted revealed that majority of librarians in university libraries in Nigeria perceive the artificial technology in a negative form which could take over their jobs and replace human librarians if adopted in the libraries. This could be the reason they are skeptical to adopt and integrate it into their day-to-day activities in their libraries. Consequently, this could lead to delivering poor library and information services in the technology-driven era which could ultimately discourage the users from patronizing the libraries. This is the thrust upon which this study is conducted to unravel the perception of librarians and challenges towards application of artificial intelligence on library and information services in university libraries in North Eastern Nigeria. This study's significance lies in its potential to inform strategies for integrating AI into Nigerian university libraries, ensuring they remain vital academic resources amid technological shifts.

Objectives of the Study

The main objective of this study was to investigate the perception of Librarians towards application of Artificial Intelligence on library and information services in University Libraries in North Eastern Nigeria. The following were the specific objective:

1. To examine the perception of Librarians towards deployment of Artificial Intelligence on library services in University Libraries in North Eastern Nigeria.
2. To Find out the challenges bedeviling deployment of Artificial Intelligence in University Libraries in North Eastern Nigeria.

Research Questions

The study was guided by the following research questions:

1. What is the perception of Librarians towards deployment of Artificial Intelligence on library services in University Libraries in North Eastern Nigeria?
2. What are the challenges bedeviling deployment of Artificial Intelligence in University Libraries in North Eastern Nigeria?

Research Hypothesis

The following null-hypothesis was tested at 0.05 level of significance in the course of this study:

Ho_1: Perception of Librarians towards Artificial Intelligence has no significant influence on library and information services in University Libraries in North Eastern Nigeria.

3.Literature Review

Librarians' Perceptions of Artificial Intelligence in Library Applications

Since the advent of information and communication technology (ICT), libraries have increasingly adopted emerging technologies. As important library stakeholders, librarians have varying opinions about the new technology. Oladokun et al. al. (2023) voiced worry that librarians' perceptions of the use of AI in library services are complex and ever-changing. While some librarians see AI as a tool that might improve user experience and productivity, others are worried about how it will affect employment positions, user privacy, and the standard of human contact in libraries. A survey was carried out in global perspectives by Yoon, Andrews, and Ward (2022) to find out what North American librarians thought about the employment of AI and related technologies in libraries. The results showed that academic a`nd public librarians had positive opinions of these technologies, with 67% of respondents saying that AI will alter library operations and 68% saying they would like training. Winkler and Kiszl (2022) conducted a study across Europe to find out what university library directors in Hungary thought about the use of AI in libraries. The majority of library directors saw AI as an opportunity rather than a threat, per the report. It could support a number of library functions, such as digitisation, information services, and instruction. It was discovered that 25% of the libraries surveyed used AI-powered data processing and information retrieval systems. Digitalisation, reference services, and virtual or online services have been identified as the areas where AI support was most suitable. The results suggested that library directors were aware of the use of AI in libraries and were in line with worldwide trends.

A study conducted in Asia by Ali et al. al. (2022) called five top librarians to find out how they felt about integrating AI into Pakistani university libraries. According to the poll,

librarians expressed concerns about the cost and resources required to use AI, even if they were aware of its potential benefits in providing innovative services and improving user experience. Additionally, Huang (2022) conducted another study on the utilisation of artificial intelligence (AI) applications in Taiwanese university libraries. The author polled librarians with and without AI implementations using quantitative research methods. The results showed that librarians who had access to more comprehensive knowledge and organisational activities on AI had more positive opinions about the technology. The poll also found that, in addition to technological challenges and privacy/ethical concerns, the largest barriers to the use of AI were financial and pricing issues. According to the analysis, libraries could likely soon adopt the top four AI applications. Orr and Niegaard (2020) emphasised concerns about automation-related job displacement in another investigation. Librarians fear that their knowledge and ability to help users may be lessened if basic jobs become automated. It is implied that librarians were concerned about AI taking over some of their duties.

A study on artificial intelligence knowledge and perception was carried out in Africa by Subaveerapandiyan, Sunanthini, and Amees (2023). By surveying 245 randomly chosen participants, this study examined the perceptions and knowledge of artificial intelligence among library and information science workers in Zambia. The findings demonstrated that while library and information science professionals had a positive and upbeat attitude towards AI, they were also worried about the potential for AI to replace librarians and the obstacles to implementing AI in Zambian libraries. According to the article, libraries should take into account the study's conclusions before introducing AI, especially with regard to facilities and technology, librarians' level of AI expertise, and leadership roles in AI projects.

Sambo and Oyovwe-Tinuoye (2023) conducted a study among Nigerian Certified Librarians regarding their awareness and perceptions of the usage of robotic technologies in libraries. Regarding respondents' perceptions on AI, the study found that 271 (72.8%) of Certified Librarians were afraid it would result in staff layoffs, 251 (64.4%) believed it would boost international recognition, and 207 (55.6%) believed it would improve library services. Additionally, a study was carried out by Owolabi, Adenekan, Adeleke, Ajayi, and Adesina (2021) to determine the level of awareness and perspective regarding artificial intelligence in the management of Nigerian university libraries. According to 85 (32.8%) of the librarians, implementing AI in university libraries may result in employment loss. Sixty-two (23.9%) believed that libraries could become more relevant in the academic world if they adopted AI. However, 40 people (15.4%) said that using AI may help academic librarians accomplish their jobs better. Finally, 72 (28%) believed that the usage of AI may improve the effectiveness of library services, which could raise patron satisfaction. Seventy-eight (31%) people concurred that integrating AI into libraries could lead to advances similar to those found in developed nations. The adoption and application of AI in academic libraries could improve library automation services, according to sixty-two (25%) of the respondents. Additionally, 57 (23%) agreed that implementing AI could undoubtedly increase the efficiency of libraries and librarians. Last but not least, 52 people (21%) concurred that implementing AI in academic libraries might facilitate easier and better access to library resources.

In a different study, Ajani, Tella, Salawu, and Abdullahi (2022) focused on librarians' perceptions of academic libraries' understanding and preparedness to incorporate AI into operations and services in Nigeria. The findings showed that librarians' opinions of the AI system and its integration were generally favourable. Nevertheless, they voiced concerns that, while integrating AI into library operations and services could advance the library by lowering human error rates caused by repetitive library tasks, it could also replace librarians if caution is not exercised.

Eiriemiokhale and Sulyman (2023) conducted a study in North Central Nigeria to ascertain the knowledge and opinions of librarians in university libraries in Kwara State, Nigeria, regarding artificial intelligence. According to the survey, the majority of participants believed that AI technologies could be implemented in university libraries with ($x = 1.42$), that AI may eventually replace human librarians ($x = 1.37$), and that AI would benefit librarians ($x = 1.31$). However, the adoption of AI technologies has the lowest mean ($x = 1.14$), suggesting that it could help reduce library stress. According to the study, the majority of respondents ($x = 1.36$) thought that the primary advantage of AI in university libraries was that it offered patron-tailored recommendations for items. This was followed by the possibility that AI could lessen the amount of manual and repetitive work that librarians had to do ($x = 1.31$) and the ability to help university libraries discover new information ($x = 1.27$). AI, however, reduces the amount of time needed to generate information ($x = 1.14$).

Additionally, Isiaka, Olarongbe, Sulyman, Aremu, and Saba-Jibril (2024) concentrated on how university libraries in Kwara State, Nigeria, assessed the value and understanding of artificial intelligence technology for effective library operations. According to the results, the majority of respondents (78, or 72.2%) thought AI chatbots would be helpful for reference services, 71, or 65.7%, thought AI would be helpful for cataloguing and classification, 67, or 62.0%, thought AI drone surveillance could be used for library security, 63, or 58.3%, thought AI expert search tools could be useful, and 60, or 55.6%, thought AI could be helpful for automating library routines. Additionally, 59 people (54.6%) thought that humanoid robots could be helpful for teaching and helping librarians, 57 people (52.8%) thought that robotic book delivery systems could be helpful, 53 people (40.1%) thought that AI digital alarms could be used to remind users when they have an appointment with a librarian, and 48 people (44.4%) thought that AI could be used for circulation tasks.

Odeyemi (2019) studied robots in university libraries in South Western Nigeria, looking into the potential for library services and the preparedness of the infrastructure. The study used a survey research methodology with observation and semi-structured interviews for a targeted group, and it embraced the post-positivist worldview. To construct the research site, three academic libraries in Nigeria—Federal

University Oye-Ekiti, Ekiti State University, Ado-Ekiti, and Afe Babalola University, Ado-Ekiti—were purposefully chosen based on their ownership (federal, state, and private). The survey discovered that, with the exception of a small number who appeared to be technophobic, librarians were excited about the possibility of using robots to provide and access library and information services. The degree of awareness, attitudes, and acceptance of artificial intelligence in university libraries in Osun State, Nigeria, was also evaluated by Oyekale and Zubairu (2023). The findings showed that while 20% of respondents had unfavourable sentiments, 80% of respondents had good perceptions and went on to say that they did not think AI could replace them in their work but rather make library routines easier. According to Oladokun et al. (2023), several librarians were concerned that the need for traditional librarian responsibilities may decline as AI technologies replaced regular activities.

Nyemezu, Ogwo, Oladokun, and Tella (2023) assessed academic librarians' opinions about the use of AI to the administration of Nigerian polytechnic libraries in South South Nigeria. Using a survey approach, the study combined quantitative and qualitative methods. Ten academic librarians who were specifically chosen from five polytechnic libraries in South-South Nigeria made up the study's participant pool. According to the study's findings, twenty-three (46%) acknowledged that implementing AI in polytechnic libraries could result in job loss; twelve (24%) agreed that doing so could increase the libraries' relevance in the academic community; nine (18%) said that implementing AI could enhance academic librarians' job performance; and six (12%) insisted that implementing AI could improve the efficiency of library services, which could ultimately increase user satisfaction.

Problems Affecting Artificial Intelligence's Use in Libraries

The ability of Nigerian university libraries to embrace and use cutting-edge technologies like artificial intelligence is hampered by certain issues. Ajani, Tella, Salawu, and Abdullahi (2022) focused on librarians' perceptions of academic libraries' awareness and preparedness to incorporate AI into library operations and services in Nigeria. The results showed that the respondents listed a number of obstacles that could prevent the technology from being integrated into library operations and services. Funding, a lack of qualified workers, a limited power supply, a limited budget for purchasing technology, and training staff to handle system maintenance were some of the difficulties that were anticipated. According to the report, adequate funding should be set aside for the purchase of AI equipment and the hiring of librarians who possess the requisite expertise to operate it.

Isiaka, Olarongbe, Sulyman, Aremu, and Saba-Jibril (2024) examined how university libraries in Kwara State, Nigeria, assessed the value and knowledge of artificial intelligence technology for effective library operations in North Central Nigeria. Potential job loss 78 (72.2%), high maintenance risk 71 (65.7%), inadequate internet service provision 65 (65.2%), technical issues 61 (56.4%), epileptic electricity or power supply 56 (51.9%), inadequate ICT facilities for AI technologies 48 (44.4%), a lack of artificial intelligence equipment, and a lack of funding from the parent institution with 60 (55.6%) were the challenges of integrating AI technology for efficient library operations, according to the analysis. In the meantime, Moustapha and Yusuf (2023) investigated how librarians in Kwara State, Nigerian university libraries adopted and used artificial intelligence. The findings showed that librarians at a library at Kwara State University were aware of the various applications of artificial intelligence in service delivery. According to the study's findings, adoption barriers include, among other issues, the substantial disruption that artificial intelligence has caused to traditional library services, a lack of skills and the requirement for training before adoption, erratic power supplies, and a lack of suitable infrastructure. According to the study, libraries and university administration should support the adoption of artificial intelligence by providing the infrastructure required to ensure its quick implementation. They should also arrange training for librarians to improve their abilities to use AI to provide services.

Bassey and Owushi (2023) conducted a survey in South South Nigeria on the adoption of AI in library and information science in the twenty-first century, with an emphasis on the perceived problems and impacts by librarians in the states of Akwa Ibom and Rivers. According to the results, the biggest obstacles to the adoption of AI in library and information science were assessed as expertise and resources (59, 36.88), followed by data quality and availability (55, 34.38%), and user acceptance and trust (46, 28.75%). Additionally, LIS instructors' awareness and perceptions of the use of AI technology in Rivers State library schools were examined by Wiche, Oladokun, and Nsirim (2023). Using a survey approach, the study combined quantitative and qualitative methods. The survey included 41 LIS instructors from Rivers State. A questionnaire for an online survey was used to gather data. Descriptive statistics were used to analyse the study. As indicated by a mean score of 3.52 in the survey, the attitude of lecturers towards the incorporation of AI was found to be the biggest obstacle. The lack of credibility of information sources and citations, internet connectivity, institutions' unfavourable perceptions of AI, lecturers' inability to use AI effectively due to its complexity, epileptic power, and a shortage of professionals to participate in AI training are additional obstacles to integrating AI technologies into library school curricula and practice.

Ahmed, Aliyu, and Ayandokun (2023) conducted a survey among LIS educators in Ebonyi State, South East Nigeria, to determine their knowledge of, access to, and use of AI technology. The poor IT/artificial intelligence infrastructure, inconsistent/poor power supply, poor interdisciplinary collaboration among professionals, such as computer scientists and library educators, the high cost of using AI applications, the lack of a vision and strategy to justify the use of AI applications in education, the lack of institutional/management policy on artificial intelligence, the lack of college specialists/experts in applying artificial intelligence techniques, and the lack of artificial intelligence technology skills were the challenges related to the

awareness, availability, and use of AI technology among LIS educators in Ebonyi State.Research Methodology

Descriptive survey research design was adopted for the study. The population of the study comprised of all professional and paraprofessional librarians working in federal and state-owned universities in North East Nigeria. The universities included: Abubakar Tafawa Balewa University, Bauchi, Adamawa State University, Mubi, Federal University, Gashua, Borno State University, Maiduguri, Federal University, Kashere, Federal University, Wukari, Gombe State University, Gombe, Modibbo Adama University, Yola, Saadu Zungur University, Gadau, Bauch State, Taraba State University, Jalingo, University of Maiduguri and Yobe State University, Damaturu. Preliminary investigation revealed that there were one hundred and eighty-six (186) professional and paraprofessional librarians working in the universities. Due to the manageable number of the population, total enumeration was adopted. A self-developed questionnaire was designed using Google Form mobile application with 4-Points-Likert scale. The title of the questionnaire was "QALAAILISULNEN" and was administered by the researchers by posting the links to the respondents on the various professional Whatsapp platforms. The personal data of the respondents was analysed using frequency counts, table and simple percentages for descriptive analysis. The data generated from the research questions were analysed using mean and standard deviation. The decision rule was, any mean score of 2.50 and above was accepted, while, any mean score of 2.49 and below was rejected. Furthermore, inferential statistics of Pearson Chi-square (X^2) was used to test null-hypothesis tested at 0.05 level of significance as criterion for accepting or rejecting the null-hypothesis. SPSS version 23.0. was used for the analyses.

Data Analysis

Out of the total one hundred and eighty-six (186) questionnaires administered, one hundred and twenty-three (123) representing 66.1% responded and their responses were analysed and found valuable.

Demographic Information of the Respondents

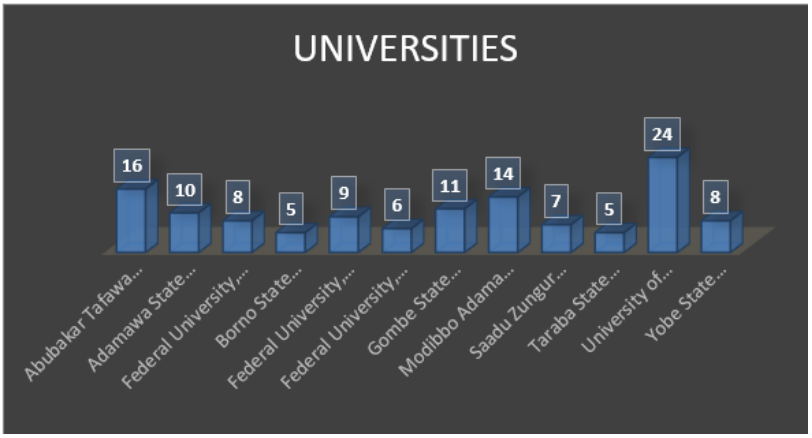

Figure 1: Universities of Respondents

Figure 1 above showed the universities of the respondents. Respondents from University of Maiduguri constituted the majority with 24(19.5%), followed by those from Abubakar Tafawa Balewa University, Bauchi with 16(13.0%), Modibbo Adama University, Yola 14(11.4%), Gombe State University, Gombe 11(8.9%), Adamawa State University, Mubi 10(8.1%), Federal University, Kashere 9(7.3%), Federal University, Gashua 8(6.5%), Yobe State University, Damaturu 8(6.5%), Saadu Zungur University, Gadau, Bauch State 7(5.7%), Federal University, Wukari 6(4.9%), while, Borno State University, Maiduguri and Taraba State University, Jalingo had 5(4.1%) each and constituted the least among the respondents.

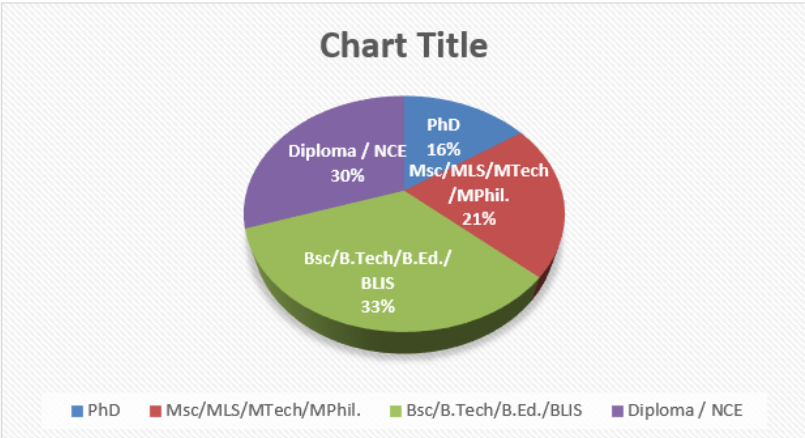

Figure 2: Level of Education of Respondents

Figure 2 above showed the level of education of the respondents. Respondents with Bsc/B.Tech/B.Ed./BLIS were the majority with 41(33.3%), they were followed by those with Diploma / NCE 37(30.1%), those with Msc/MLS/MTech/MPhil. Were 26(21.1%), while, those with PhD were 19(15.5%) and were the least among the respondents.

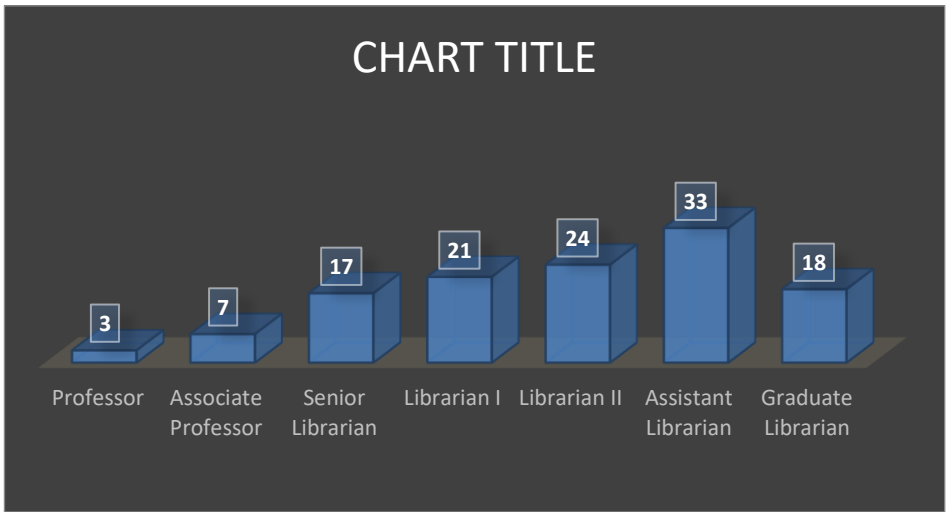

Figure 3: Rank of Respondents

Figure 3 above showed the rank of the respondents. Respondents in the rank of Assistant Librarian constituted the majority with 33(26.8%), followed by Librarian II with 24(19.5%), Librarian I were 21(17.1%), Graduate Librarian were 18(14.7%), Senior Librarian were 17(13.8%), Associate Professors were 7(5.7%), while, Professors were the least among the respondents with only 3(2.4%).

Research Question 1: To examine the perception of Librarians towards deployment of Artificial Intelligence on library and information services in University Libraries in North Eastern Nigeria.

Table 1: Perception of Librarians in the deployment of Artificial Intelligence in Federal University Libraries

S/N	Statements	N	Sum	Mean	Std	Decision
1	AI will help improve library and information services	123	410	4.33	0.74	High
2	AI will ease our duties in the library by eliminating repetitive tasks	123	542	4.41	0.72	High
3	AI will facilitate discovery of new knowledge in libraries	123	341	2.77	0.81	Moderate
4	AI will become better at tasks that used to require human intelligence.	123	303	2.46	1.18	Low
5	AI will improve our job performance thereby improving the academic performance of the users	123	276	2.24	1.07	Low
6	AI will help satisfy users' information needs without difficulty	123	528	4.29	0.94	High
7	AI will surely enhance libraries and librarians' productivity	123	533	4.33	0.74	High
8	AI will replace human librarians if adopted in the library	123	369	3.00	0.66	Moderate
	Total		**3302**	**3.48**	**0.86**	**Moderate**

Source: Field survey, 2024

Table 1 presents the descriptive statistics on the responses of the perception of Librarians towards application of Artificial Intelligence on library and information services. From the Table, it was discovered that the librarians perceived that AI will ease duties in the library by eliminating repetitive tasks attracted the highest mean score of ($\overline{X} = 4.41$, SD = 0.72), followed by improve library and information services ($\overline{X} = 4.33$, SD = 0.74), enhance libraries and librarians' productivity ($\overline{X} = 4.33$, SD = 0.74), satisfy users' information needs without difficulty ($\overline{X} = 4.29$, SD = 0.94), will replace human librarians if adopted in the library ($\overline{X} = 3.00$, SD = 0.66) and facilitate discovery of new knowledge in libraries ($\overline{X} = 2.77$, SD = 0.81). Furthermore, the overall mean score of 3.48 implied that the perception of Librarians towards application of Artificial Intelligence on library and information services in University Libraries in North Eastern Nigeria was moderate.

Research Question 2: What are the challenges bedeviling deployment of Artificial Intelligence in University Libraries in North Eastern Nigeria?

Table 2: Challenges bedeviling deployment of Artificial Intelligence in University Libraries in North Eastern Nigeria

S/N	Statements	N	Sum	Mean	Std	Decision
1	Lack of funding and limited budget to procure the technology	123	389	3.16	0.74	Agree
2	Inadequate expertise and skills	123	380	3.09	0.76	Agree
3	Limited power supply	123	354	2.88	0.88	Agree
4	High risk of maintenance	123	331	2.69	0.97	Agree
5	Inadequate internet services and low bandwidth	123	375	3.05	0.97	Agree
6	High cost of using AI applications and infrastructure	123	429	3.49	0.69	Agree
7	Poor IT/Artificial Intelligence infrastructure	123	385	3.13	1.23	Agree
8	Absence of institutional/management policy on Artificial Intelligence	123	388	3.15	1.21	Agree
9	Lack of professionals to engage in AI training	123	383	3.11	1.26	Agree
	Total		**3414**	**3.08**	**0.97**	**Agree**

Source: Field survey, 2024

Table 2 presents the descriptive statistics on the responses on the challenges bedeviling deployment of Artificial Intelligence in University Libraries in North Eastern Nigeria. From the Table, it was discovered that all the items listed attracted mean scores above the acceptable bench mark. They include: high cost of using AI applications and infrastructure ($\overline{X} = 3.49$, SD = 0.69), lack of funding and limited budget to procure the technology ($\overline{X} = 3.16$, SD = 0.74), absence of institutional/management policy on Artificial Intelligence ($\overline{X} = 3.15$, SD = 1.21), poor IT/Artificial Intelligence infrastructure ($\overline{X} = 3.13$, SD = 1.23), lack of professionals to engage in AI training ($\overline{X} = 3.11$, SD = 1.26), inadequate expertise and skills ($\overline{X} = 3.09$, SD = 0.76), inadequate internet services and low bandwidth ($\overline{X} = 3.05$, SD = 0.97), limited power supply ($\overline{X} = 2.88$, SD = 0.88) and high risk of maintenance ($\overline{X} = 2.69$, SD = 0.97). Furthermore, the overall mean score of 3.08 implied that the Librarians had expressed agreement with all the challenges listed bedeviling application of Artificial Intelligence in University Libraries in North Eastern Nigeria.

Hypotheses Testing

Ho_1: Perception of Librarians towards Artificial Intelligence has no significant influence on library and information services in University Libraries in North Eastern Nigeria.

Table 3: Chi-Square Result on the significant influence of Librarians level of perception towards Artificial Intelligence on library and information services.

Chi-Square Tests			
	Value	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	31.867[a]	9	0.000
Likelihood Ratio	35.559	9	0.000
Linear-by-Linear Association	23.787	1	0.000
N of Valid Cases	123		

Source: Field survey, 2024

In Table 3, the Chi-Square result indicated that Librarians level of perception towards Artificial Intelligence has significant influence on library and information services at 0.05 level of significance. Therefore, hypothesis two (2) is rejected, because, the probability value (P = 0.000) is less than critical value at 0.05 level of significance at a Chi-Square value = 31.87. Hence, Librarians level of perception towards Artificial Intelligence has significant influence on library and information services in University Libraries in North Eastern Nigeria.

4.Discussion of Findings

This study determined the perception of librarians and challenges towards application of artificial intelligence on library and information services in university libraries in North Eastern Nigeria. The study revealed that the perception of Librarians towards application of Artificial Intelligence on library and information services in University Libraries in North Eastern Nigeria was moderate. They expressed that AI could help improve library and information services, ease duties in the library by eliminating repetitive tasks, help satisfy users' information needs without difficulty and enhance libraries and librarians' productivity. This finding concurred with Owolabi, Adenekan, Adeleke, Ajayi and Adesina (2021) study which revealed that management of university libraries in Nigeria agreed that AI adoption in the libraries could make the libraries more relevant in the academic community, improve academic librarians' job performance, increase library services' efficiency, bring innovations to libraries, boost library automation services, enhance libraries and librarians' productivity as well as promote better and easy access to library information. Ajani, Tella, Salawu and Abdullahi (2022) revealed that the perceptions of librarians and the integration of the AI system were somewhat positive, however, they expressed reservations that the integration of AI in library operations and services could take the library to the next level by reducing human errors due to repetitiveness in library tasks and at the same time, it might take their job role if care is not taken. Eiriemiokhale and Sulyman (2023) showed that Librarians in University Libraries in Kwara State, Nigeria perceived AI provides patron-tailored recommendations to items as the main benefits of AI in university libraries, reduce manual and repetitive tasks performed by librarians and facilitates the discovery of new knowledge in university libraries. However, the study was in disagreement with Oladokun, et al. (2023) which found that some librarians

feared that as AI systems take over routine tasks, there might be a decrease in the demand for traditional librarian roles.

Moreover, this study reported that the challenges bedeviling application of Artificial Intelligence in University Libraries in North Eastern Nigeria were high. They include: cost of using AI applications and infrastructure, lack of funding and limited budget to procure the technology, absence of institutional/management policy on Artificial Intelligence, poor IT/Artificial Intelligence infrastructure, lack of professionals to engage in AI training, inadequate expertise and skills, inadequate internet services and low bandwidth, limited power supply and high risk of maintenance. This finding corroborates with that of Ajani, Tella, Salawu and Abdullahi (2022) which reported that lack of funding, inadequate experts, limited power supply, limited budget to procure the technology and training personnel that could be in charge of the system maintenance were the challenges that might hinder the application of the technology especially AI into the library operations and services. Similarly, Isiaka, Olarongbe, Sulyman, Aremu and Saba-Jibril (2024) showed that the challenges of AI technology integration for efficient library operations were high risk of maintenance, inadequate internet service provision, technical problems, epileptic electricity or power supply, inadequate ICT facilities for AI technologies, insufficient artificial intelligence equipment and insufficient funding from the parent institution. While, Bassey and Owushi (2023) reported lack of expertise, resources, data quality and availability as well as user acceptance and trust. Other studies that align with this finding include: Moustapha and Yusuf (2023), Ahmed, Aliyu and Ayandokun (2023) as well as Wiche, Oladokun and Nsirim (2023) among others.

The hypothesis tested revealed that Librarians level of perception towards Artificial Intelligence has significant influence on library and information services in University Libraries in North Eastern Nigeria.

5.Conclusion

This study underscores that librarians in North Eastern Nigerian university libraries hold a moderate view of AI's potential to enhance services, streamline tasks, and boost productivity, yet face substantial hurdles like funding, infrastructure, and expertise gaps. The significant influence of their perceptions on service delivery highlights the need for targeted interventions. As global library practices evolve, addressing these challenges could position Nigerian libraries as competitive academic assets.

6.Recommendation

Based on the findings of this study and the conclusion made, the following were recommended:

1. Management of university libraries in North East Nigeria should as matter of priority organise training and retraining for librarians in aspects emerging technologies such as artificial intelligence, cloud computing, virtual reality and big data, among others. This could go a long way in changing the perception of the librarians towards the emerging technologies.
2. Since funding of university libraries is becoming difficult to handle, management of the universities in North East Nigeria should seek for collaboration and partnership with national and international organisations so as to attract more funding, digital resources and expertise to their libraries. This could help the libraries overcome their challenges.

References

[1] Ahmed, A. O., Aliyu, M. B. & Ayandokun, A. A. (2023). Awareness, Availability, and Utilisation of Artificial Intelligence Technology among LIS Educators in Ebonyi State. Proceedings of the 25th Annual National Conference & General Meeting of the National Association of Library and Information Science Educators (NALISE), 80-80, held at 250 Capacity Auditorium, University of Uyo (Main Campus), AkwaIbom State on 30th October – 3rd November, 2023.

[2] Ajani, Y. A., Tella, A., Salawu, K. Y., & Abdullahi, F. (2022). Perspectives of Librarians on Awareness and Readiness of Academic Libraries to Integrate Artificial Intelligence for Library Operations and Services in Nigeria. Internet Reference Services Quarterly, 26(4), 213–230. Available via: https://doi.org/10.1080/10875301.2022.2086196.

[3] Ali, M. Y., Naeem, S. B., Bhatti, R., & Richardson, J. (2022). Artificial intelligence application in university libraries of Pakistan: SWOT analysis and implications. Global Knowledge, Memory and Communication, ahead-of-print(ahead-of-print). https://doi.org/10.1108/GKMC-12-2021-0203.

[4] Bassey, M. M. &Owushi, E. (2023). Adoption of Artificial Intelligence in Library and Information Science in the 21st Century: Assessing the Perceived Impacts and Challenges by Librarians in AkwaIbom and Rivers States. International Journal of Current Innovations in Education, 6(1): 75-85.

[5] Cox, A. (2023). How artificial intelligence might change academic library work: Applying the competencies literature and the theory of the professions. Journal of Association of Information Science and Technology, 74:367–380. DOI: 10.1002/asi.24635.

[6] Eiriemiokhale, K. A., Sulyman, A. S. (2023). Awareness and Perceptions of Artificial Intelligence among Librarians in University Libraries in Kwara State, Nigeria. Indonesian Journal of Librarianship, 4 (2), 107-118. DOI: Available via: https://doi.org/10.33701/ijolib.v4i2.3364.

[7] Huang, Y. H. (2022). Exploring the implementation of artificial intelligence applications among academic libraries in Taiwan. Library Hi Tech, ahead-of-print(ahead-of-print). https://doi.org/10.1108/LHT-03-2022-0159.

[8] Isiaka, A. O., Olarongbe, S. A., Sulyman, M. O., Aremu, B. A. & Saba-Jibril, S. (2024). Perceived awareness and usefulness of artificial intelligence technology for efficient library operations in university libraries in Kwara State, Nigeria. Journal of Library Services and Technologies, 6(1), 120 – 134. DOI: http://doi.org/10.47524/jlst.v6i1.121.

[9] Moustapha, A. A. & Yusuf, I. O. (2023). Artificial Intelligence Adoption and Utilization by Librarians in

University Libraries in Kwara State, Nigeria. Library Philosophy and Practice (e-journal). 7917. Available: https://digitalcommons.unl.edu/libphilprac/7917.

[10] Nyemezu, C. O., Ogwo, O., Oladokun, B. D. &Tella, A. (2023) The many things AI can do: Gauging academic librarians' perception towards the use of AI in the management of Nigerian polytechnic libraries. Proceedings of the 25th Annual National Conference & General Meeting of the National Association of Library and Information Science Educators (NALISE), 80-80, held at 250 Capacity Auditorium, University of Uyo (Main Campus), AkwaIbom State on 30th October – 3rd November, 2023.

[11] Odeyemi, S. O. (2019). Robots in Nigerian academic libraries: Investigating infrastructural readiness and potential for library services. A paper presented at IFLA Conference, Theme: Information Technology Satellite Meeting "Robots in libraries: challenge or opportunity?" 21-22 August 2019 Technical University of Applied Sciences Wildau, Germany

[12] Okunlaya, R. O., Syed Abdullah, N., & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. Library Hi Tech, 40(6), 1869–1892. doi: 10.1108/LHT-07-2021-0242.

[13] Oladokun, B. D., Emmanuel, V. O., Diseiye, O. & Ben, E. N. (2023). Awareness and perception of artificial intelligence among library and information science professionals in River State. Proceedings of the 25th Annual National Conference & General Meeting of the National Association of Library and Information Science Educators (NALISE), 80-80, held at 250 Capacity Auditorium, University of Uyo (Main Campus), AkwaIbom State on 30th October – 3rd November, 2023.

[14] Omame, I. M. & Alex-Nmecha, J. C. (2020). Artificial intelligence in libraries. In Osuigwe, N. (Ed.), Managing and Adapting Library Information Services for Future Users, IGI Global, 120-144. Doi: 10.4018/978-1-7998-1116-9.ch008.

[15] Owolabi, K. A., Adenekan, F. N., Adeleke, O. A., Ajayi, T. A. & Adesina, O. A. (2021). Awareness and Perception of the Artificial Intelligence in the Management of University Libraries in Nigeria. Journal of Interlibrary Loan, Document Delivery & Electronic Reserve, DOI: 10.1080/1072303X.2021.1918602.

[16] Owolabi, K. A., Okorie, N. C., Yemi-Peters, O. E., Oyetola, S. O., Bello, T. O. & Oladokun, B. D. (2022). Readiness of academic librarians towards the use of robotic technologies in Nigerian university libraries. Library Management, 935.

[17] Oyekale, J. O. & Zubairu, A. N. (2023). Assessment of Awareness, Perceptions, and Adoption of Artificial Intelligence in University Libraries in Osun State, Nigeria. Tin-City Journal of Library, Archival & Information Science, 12(1): 131-138.

[18] Sambo, A. S. & Oyovwe-Tinuoye, G. (2023). Awareness and Perception of Certified Librarians of Nigeria Towards the Use of Robotic Technologies in the Libraries. Ghana Library Journal, 28(1): 1-74.

[19] Subaveerapandiyan, A., Sunanthini, C &Amees, M. (2023). A study on the knowledge and perception of artificial intelligence. IFLA Journals, 49(3). https://doi.org/10.1177/03400352231180230.

[20] Tella, A. (2020). Robots are coming to the libraries are librarians ready to accommodate them? Library Hi Tech News, 37(8), 13–17. https://doi.org/10.1108/LHTN-05-2020-0047.

[21] Wiche, H. I., Oladokun, B. D. & Nsirim, O. (2023). Awareness and perception of LIS educators towards the adoption of AI technologies in library schools in Rivers State. Proceedings of the 25th Annual National Conference & General Meeting of the National Association of Library and Information Science Educators (NALISE), 80-80, held at 250 Capacity Auditorium, University of Uyo (Main Campus), Akwa Ibom State on 30th October – 3rd November, 2023.

[22] Winkler, B., & Kiszl, P. (2022). Views of Academic Library Directors on Artificial Intelligence: A Representative Survey in Hungary. New Review of Academic Librarianship, 28(3), 256–278. https://doi.org/10.1080/13614533.2021.1930076.

[23] Yoon, J., Andrews, J. E., & Ward, H. L. (2022). Perceptions on adopting artificial intelligence and related technologies in libraries: Public and academic librarians in North America. Library Hi Tech, 40(6), 1893–1915. https://doi.org/10.1108/LHT-07-2021-0229.