

APPLICATION OF ARTIFICIAL INTELLIGENCE IN SERVICE DELIVERY IN ACADEMIC LIBRARIES IN PUBLIC UNIVERSITIES IN SOUTH-EAST, NIGERIA

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Abstract

The study investigated the application of artificial intelligence in service delivery in academic libraries in public universities in South East, Nigeria. Three research questions guided the study. Descriptive survey research design was adopted for the study. The population of the study consisted of 347 librarians in public universities in South East, Nigeria. A sample size of 174 librarians was drawn for the study using proportionate stratified sampling technique. A researcher-developed questionnaire titled “Application of Artificial Intelligence in Service Delivery Questionnaire (AISDQ)” was used for data collection. Mean and standard deviation were used for data analysis. The results of the study showed among others that artificial intelligence are not applied in delivery of acquisition, cataloguing and reference services in academic libraries in public universities in South East, Nigeria. Based on the findings, it was recommended among others that University management should invest funds into annual training of librarians to enable them acquire skills and knowledge in application of artificial intelligence to improve service delivery in academic libraries.

Keywords: Artificial Intelligence, Service Delivery, Academic Libraries, Acquisition, Cataloguing, Reference

Introduction

University library is considered as the intellectual heart of tertiary education, serving as gateway to knowledge, research and innovation. In an era of rapid information explosion and technological advancement, the role of university libraries extends far beyond merely housing books; they function as dynamic centers that support teaching, learning and intellectual growth in a university community. It is designed to meet the diverse needs of its users, offering both physical and digital collections, study spaces, and access to expert librarians who can guide users in finding and using information effectively. University library is a vital resource that empowers the university community to engage with scholarly work, explore new ideas, and advance academic goals.

Library service delivery is a fundamental aspect of university library operations, focusing on the provision of assistance and support provided to patrons to satisfy their information needs. Bello and Abdulsalam (2023) defined library service delivery as all the tangible services offered by librarians to patrons to ensure full utilization of the resources available in the library for meeting their information needs. The authors further emphasized that service delivery is the vital responsibilities of librarians to ensure unrestricted access to relevant information resources for educational, economic, research and cultural advancement of the society. Hence, Library service delivery involves assisting library users in searching, locating, retrieving and effectively utilizing resources to meet their informational needs. In recent years, one of the most significant transformations in library operations and service delivery has been the integration of artificial intelligence (AI), which is reshaping how libraries provide access to information and support user needs.

Artificial Intelligence (AI) has emerged as one of the most transformative technologies influencing various sectors, including education and information services. Today AI is increasingly being explored as a tool for improving the efficiency and effectiveness of service delivery in the libraries. Artificial intelligence refers to technological systems that can sense, listen, act and perform tasks that would normally require human intelligence. Alala, Uzoaru and Odikwa (2024) described AI as the use of computer programming to perform tasks that would typically require human intelligence. They further, assert that the primary objective of artificial intelligence in libraries is to create computer systems or machines that possess the ability to think, behave and effectively compete with human intellect. Similarly, Manik (2024) conceptualized AI as a technology that enables computers and machines to simulate human intelligence and problem-solving capabilities. AI computer system is capable of recognizing speech and image, engaging in logical reasoning, identifying and solving problems. Contextually, Artificial Intelligence (AI) refers to computer systems that have capacity to carry out tasks that usually require human intelligence.

The application of artificial intelligence in libraries has the potential to significantly enhance service delivery by automating routine tasks and improving access to information resources. AI can automate work processes to improve efficiency in library service delivery. Syaharuddin, Ardyawin and Iswanto (2024) assert that the application of artificial intelligence (AI) in the library environment has become increasingly important in efforts to improve accessibility, efficiency, and the quality of information services. It is capable of improving the search and access to information in libraries. Eiriemiokhale and Sulyman

(2023) posit that the use of AI, can simplify the duties of librarians and improve the efficiency of library service delivery. Olayode (2022) also maintains that artificial intelligence (AI) can help libraries update and expand their services, thereby enhancing their relevance in the modern digital information environment.

There are several AI tools and application that have the capacities to automates different aspects of service delivery in university libraries. Bakiri, Mbembati and Tinabo (2023) identified some AI tools such as natural language processing (NLP), chatbots, robotics, and big data technologies. Other AI technologies include expert system, neural network, Monograph Selection Advisor and pattern recognition systems. Manik (2024) further notes that AI applications in libraries include expert systems for reference services, book-reading robots, and virtual reality technologies that support immersive learning experiences. These AI tools can be applied in various areas of library operations such as acquisition, cataloguing, reference service, classification, indexing (Vijayakumar & Sheshadri, 2019; Idemudia & Makinde, 2023).

In the area of acquisition, AI can assist librarians in the selection and procurement of relevant information resources, helping them make informed decisions regarding resource selections. In cataloguing, AI can significantly streamline the organization and description of library resources while in reference services, AI applications such as chatbots, virtual assistants and expert systems can enhance user interaction and provide immediate responses to information queries. However, the focus of this study is specifically on the application of AI in the delivery of acquisition, cataloguing and reference services in university libraries.

Acquisition is the process of acquiring or adding to information resources in academic libraries. Idemudia and Makinde (2023) noted that Monograph Selection Advisor is a form of AI that can be useful in acquisition of information materials in academic library. AI is useful in collection of online resources in academic libraries. AI can be automated to select and procure information resources in the library. Emumejakpor, Ovie and Ekuerhare (2024) maintained that Artificial intelligence (AI) has given rise to the notion of an expert system which emulate human specialists through their capacity to provide guidance, instruct and carry out intelligent activities in acquiring information materials in academic library. AI can review books to ascertain their sufficiency in quality or subject interest and make recommendations for procurement in the library. AI is capable of searching catalog to ascertain the available and needed materials to avoid duplication of information resources in academic libraries.

Cataloguing is the orderly arrangement of information resources for easy retrieval. It involves the systematic organization of information resources according to specific bibliographic elements such as author, title and subject matter. Ram (2023) noted that AI is capable of automating routine tasks of cataloguing and organizing information resources which save librarians' valuable time and ensure a more accurate and organized library system. AI has the ability to create and maintain information of the available resources in the library. Kalbande, Yuvaraj, Verma, Subaveerapandiyam Suradkar and Chavan (2024) posited that AI can streamline cataloguing processes by automatically generating metadata for new acquisitions, ensuring that resources are correctly classified and easily retrievable. Kalbande et al noted that this automation not only saves time but also reduces the potential

for human error, leading to more accurate and comprehensive library catalogues. Syaharuddin, Ardyawin and Iswanto (2024) pointed out that AI technologies like BERT language models can enhance search capabilities and automate cataloguing to enhance service delivery in library. Emumejakpor, Ovie and Ekuerehare (2024) noted that artificial intelligence can be applied in cataloguing through the use of human-machine interaction where the support system and intermediary share intellectual work. The authors added that AI can leverage the information in the titles of biological materials to assign as many categories as feasible of those that would be allocated by human indexers. Information resources in academic libraries are made known to library patrons through reference service.

Reference service is the act of assisting patrons to search for required information. Idemudia and Makinde (2023) averred that reference services involve the provision of personalized assistance by librarians to users who are seeking information. It involves assisting library users in searching and locating information resources. Gyang (2020) noted that reference services are getting more complicated for subject librarians due to increasing interdisciplinary research topics and team work. The author added that with the application of AI, it is seen that increasing interdisciplinary research topics can have the most useful bibliographies. Artificial intelligence is capable of asking users what kind of information they require and make available resources or application they might need. Kalbande et al (2024) noted that AI-powered recommendation systems can analyse user data, including borrowing history and search patterns, to suggest books, articles, and other resources that match users' interests.

It is observed that some librarians are reluctant to accept and embrace new technology in discharging their duties. Some librarians tend to possess insufficient skills to use AI in carrying out their official roles. Alala et al (2024) asserted that resistance to change and weak skills of some librarians create difficulties for AI integration in delivering services in academic libraries in Nigeria. The application of AI within academic libraries in public universities in South East, Nigeria tend to be adversely affected by shortages of skills, irregular power supply, financial constraints and insufficient ICT facilities. It is on this note that this study investigated application of artificial intelligence in service delivery in academic libraries in public universities in South East, Nigeria.

Research Questions

The following research questions will guide the study:

1. What is the application of artificial intelligence in delivery of acquisition service in academic libraries in public universities in South East, Nigeria?
2. What is the application of artificial intelligence in delivery of cataloguing service in academic libraries in public universities in South East, Nigeria?
3. What is the application of artificial intelligence in delivery of reference service in academic libraries in public universities in South East, Nigeria?

LITERATURE REVIEW

Artificial Intelligence

Artificial intelligence (AI) is the developing and programming of computers to execute tasks that require human intelligence such as visual sensitivity, speech recognition and language translation, among others. Okoye (2024) noted that AI involves leveraging

computer technology to mimic human intelligence and perform tasks that would typically require human intervention. It entails programming technological devices to develop the ability to imitate human intelligence, manipulate symbols and carry out activities. AI is electronic devices and applications programmed to meticulously mimic the human's ability to think, learn and make decisions. According to Salman, Ismaila and Ajani (2023), AI is a method of getting machines to function and behave like humans.

AI is the manipulation of computer devices to think, act and solve problems like human can actually do. Oniovoghai, Idiodi and Urhiewhu (2023) defined AI as a replica knowledge obtained through the use of computer peripherals and programmed to become actual and valuable to mankind due to its technical application and usage. Continuing, the authors stressed that Artificial Intelligence's goal is to create computers that can think, see, hear, walk, communicate, and feel, and the beauty of this technology is that it can recognize patterns at a size and pace that humans cannot. AI is a computer system capable of recognizing speech and image, engaging in logical reasoning, identifying and solving problems. Quadri (2024) noted that Artificial intelligence is used in library systems for various tasks, such as subject indexing, shelf reading, collection creation, shelf cataloguing, shelf reading services, and information retrieval systems.

Artificial Intelligence (AI) is a technological device that can sense, listen, act and perform tasks that normally could have be carried out by human. Owusu-Ansah et al. (2024) asserted that AI does not refer to a single technology; rather, it is an umbrella term for a variety of technologies and methods, including machine learning, natural language processing, data mining, neural networks, and algorithms. Ibrahim and Okpala, (2024)

noted that the goal of AI is to develop systems that can perform tasks typically requiring human intelligence, thereby enabling automation, improving efficiency, and offering solutions to previously unsolvable problems. The authors added that AI enables libraries to process vast amounts of data, derive valuable insights, optimize resource allocation, and improve decision-making processes. Contextually, Artificial Intelligence (AI) is computer systems that have capacities of carrying out tasks that usually need human intelligence.

Service Delivery

Service delivery is the act of offering assistance to individuals to meet their needs or expectations. Ikhenoba and Atakpa (2023) described service delivery as the process of rendering quality services by public institutions to consumers of its products and services. In the context of library, Bakiri, Mbembati and Tinabo (2023) described service delivery as processes of acquiring, managing, and disseminating information to information seekers. They added that it also involves organizing, packaging and repackaging information from diverse information containers in a way that can be easily accessed and retrieved by library users.

Library service delivery is the act of helping library users in searching, locating, retrieving and utilizing resources to meet their informational needs. Library service delivery is defined by Bello and Abdulsalam (2023), as all the tangible offers given by librarians to patrons to ensure full exploitation of the resources in the library in meeting their information needs. The authors added that service delivery is the vital responsibilities of librarians to ensure unrestricted access to needed information resources for educational, economic, research and cultural advancement of the society. Operationally, library service

delivery is the activities concerned with providing and making information resources accessible to patrons to satisfy their needs.

Application of Artificial Intelligence in Delivery of Acquisition Service

Acquisition is the process of acquiring or adding to information resources in academic libraries. Oniovoghai, Idiodi and Urhiewhu (2023) noted that application of AI in acquisition service delivery allows the academic library's collection development section to be extremely precise in reacting to user needs in the library without the need for human intervention. They added that AI is capable of sourcing for users' particular needs and makes these relevant information materials readily available through suitable selection tools and acquisition methods. AI is capable of searching catalog to ascertain the available and needed materials to avoid duplication of information resources in academic libraries. Idemudia and Makinde (2023) noted that Monograph Selection Advisor is a form of AI that can be useful in acquisition of information materials in academic library. Ibrahim and Okpala, (2024) posited that by analysing user behaviour and preferences, AI can generate personalized recommendations for books, articles, or other resources for acquisition. AI can be automated to select and procure information resources in the library.

Emumejakpor, Ovie and Ekuerehare (2024) maintained that Artificial intelligence (AI) has given rise to the notion of an expert system which emulate human specialists through their capacity to provide guidance, instruct and carry out intelligent activities in acquiring information materials in academic library. AI can review books to ascertain their sufficiency in quality or subject interest and make recommendations for procurement in the library. AI is useful in collection of online resources in academic libraries. Owusu-

Ansah et al. (2024) noted that AI applications in academic libraries can facilitate and enhance acquisition of resources for effective service delivery.

Application of Artificial Intelligence in Delivery of Cataloguing Service

Cataloguing is the orderly arrangement of information resources for easy retrieval. It entails arranging information materials based on author, title and subject matter. Kalbande, Yuvaraj, Verma, Subaveerapandiyam Suradkar and Chavan (2024) posited that AI can streamline cataloguing processes by automatically generating metadata for new acquisitions, ensuring that resources are correctly classified and easily retrievable. Okoye (2024) asserted that AI adoption in cataloguing in libraries will lead to better information processing and faster access, benefiting both library staff and users. Kalbande et al noted that this automation not only saves time but also reduces the potential for human error, leading to more accurate and comprehensive library catalogues. Hubert-Nwangwu and Ijantiku (2023) maintained that AI can improve the efficiency and accuracy of cataloguing in library operations, leading to faster and more reliable services for library users. Ram (2023) noted that AI has the ability to create and maintain information of the available resources in the library.

AI is capable of automating routine tasks of cataloguing and organizing information resources which save librarians' valuable time and ensure a more accurate and organized library system. Orubebe, Oloniruha and Oladok (2024) posited that AI provides advantages such as enhancing virtual reference services to enrich users' experience in libraries. Syaharuddin, Ardyawin and Iswanto (2024) pointed out that AI technologies like BERT language models can enhance search capabilities and automate cataloguing to enhance

service delivery in library. Emumejakpor, Ovie and Ekuerhare (2024) noted that artificial intelligence can be applied in cataloguing through the use human-machine interaction where the support system and intermediary share intellectual work. The authors added that AI can leverage the information in the titles of biological materials to assign as many categories as feasible of those that would be allocated by human indexers. Vijayakumar and Sheshadri (2019) noted that cataloging text generated online, it can be passed through a knowledge-based system, and the intermediary does the cataloging process without any intellectual input. Information resources in academic libraries is made known to library patrons through reference service.

Application of Artificial Intelligence in Delivery of Reference Service

Reference service is the act of assisting patrons to search for required information. Gyang (2020) noted that reference services are getting more complicated for subject librarians due to increasing interdisciplinary research topics and team work. The author added that with the application of AI, it is seen that increasing interdisciplinary research topics can have the most useful bibliographies. Ibrahim and Okpala, (2024) opined that AI-driven virtual assistants and chatbots can enhance reference service delivery by providing real-time support to library patrons, answering queries, assisting with research, and offering guidance on library services, operating hours, and resources. Hubert-Nwangwu and Ijantiku (2023) noted that by analyzing user preferences and behavior,

AI could be applied in reference service delivery by taking the request of library patrons and assisting them to locate the sources of relevant information based on their needs. AI algorithms can provide personalized recommendations and improve reference

services by suggesting relevant resources and materials to individual users based on their specific interests and needs. . Okoye (2024) opined that integrating AI in reference services in libraries will lead to improved information processing and faster access, making both library staff and users happy. Bakiri, Mbembati and Tinabo (2023) pointed out that the proper use of AI technology specifically chatGPT enhances library services such as search, discovery and reference services

Emumejakpor, Ovie and Ekuerhare (2024) asserted that AI inform of reference advisory system (RAS) is capable of suggests references depending on users' information demands and needs. Through machine learning algorithms, libraries can analyse user behaviour, preferences, and historical data to provide customised recommendations or reference services (Ram, 2023). Oniovoghai, Idiodi and Urhiewhu (2023) noted that the application of an expert system to the academic library's reference service unit will go a long way toward improving the efficiency of the routine reference librarian's duty. In addition, the authors averred that the application of artificial intelligence in reference service delivery will assist library users in learning how to use the library's information resource materials, as well as assisting patrons in locating information resource materials on the shelves and further guiding library users on the types of information resource materials available. AI such as REFSEARCH, POINTER, Online Reference Assistance (ORA), AMSWERMEN, PLEXUS are advisory systems for locating reference resources and factual data (Vijayakumar & Sheshadri, 2019).

Quadri (2024) examined the awareness and adoption of artificial intelligence for effective library service delivery in academic libraries in Kwara state Nigeria. The study's

findings revealed that AI is beneficial to academic libraries for effective library services and operations because it helps to eliminate repetitive and tedious task; it helps to make library services more effective and efficient to improve user satisfaction, among others. It was revealed from the findings that academic libraries in Nigeria are not ready for the integration of AI systems in library operations and services. Based on the findings, it was recommended among others that there should be an improved budget for library automation, procuring the technology, and training library personnel, there is a need for adequate funding for academic libraries in Nigeria.

Eiriemiokhale and Sulyman (2023) conducted a study on awareness and perceptions of artificial intelligence among librarians in university libraries in Kwara State, Nigeria. The findings of the study revealed among others that Chatbots and Dynamed are the AI the respondents were aware of, respondents perceived that AI is beneficial in university libraries because it provides patron-tailored recommendations to items, can reduce manual and repetitive tasks performed by librarians and facilitates the discovery of new knowledge.

Bakiri, Mbembati and Tinabo (2023) investigated artificial intelligence services at academic libraries in Tanzania: Awareness, adoption and prospects. The findings of the study showed that AI was not adopted for rendering cataloguing services in academic libraries. Oyekale and Zubairu (2023) conducted a study on assessment of awareness, perceptions, and adoption of artificial intelligence in university libraries in Osun State, Nigeria. Findings revealed that respondents have positive perception towards AI, and affirmed that AI is here to make library routine easier and not to take their job from them.

Methods

The descriptive survey research design was adopted for the study. This design is deemed appropriate, since the researcher collected data from a given population of the study to investigate application of artificial intelligence in service delivery in academic libraries in public universities in South East, Nigeria. The population of the study comprised 347 librarians in public universities in South East, Nigeria. Proportionate stratified sampling technique was used to draw a sample size of 174 librarians which represented 50% of the study.

A researcher-developed questionnaire titled “Application of Artificial Intelligence in Service Delivery Questionnaire (AISDQ)” was used for data collection. AISDQ has three clusters namely: A, B and C. Cluster A contained eight items on application of artificial intelligence in delivery of acquisition service, cluster B contained seven items on application of artificial intelligence in delivery cataloguing service and Cluster C had seven items on application of artificial intelligence in delivery of reference service. The instrument therefore contains a total of 22 items which are structured on a four-point rating scale of Strongly Agree (SA), Agree (A), Disagree (D); Strongly Disagree (SD) weighted 4, 3, 2 and 1 respectively.

A total of 174 copies of the questionnaire were distributed, out of which 171 copies were properly filled and successfully retrieved indicating 98% percent return rate. Mean and standard deviation were used for data analysis. The decision criteria on the research questions are that any item with a mean score equal or above 2.50 indicated agreement, while the item with a mean score below 2.50 indicated disagreement.

Results and Discussion

Research Question 1: What is the application of artificial intelligence in delivery of acquisition service in academic libraries in public universities in South East, Nigeria?

Table 1: Mean Ratings and Standard Deviation Scores on the Application of Artificial Intelligence in Delivery of Acquisition Service in Academic Libraries

S/ N	ITEMS	(n =174)		
		Mean	SD	Decision
1	AI is applied in processing request for resources	2.41	1.05	Disagree
2	AI automates verification process of information resources	2.45	1.09	Disagree
3	AI is applied in ordering for information materials	2.43	1.00	Disagree
4	AI is automated to make report of processes of purchasing resources	2.38	1.11	Disagree
5	AI is adopted to receive online order for materials	2.40	1.06	Disagree
6	AI is used to automate subscription of information resources	2.56	1.01	Agree
7	AI is applied to maintain necessary records related to procurement of information materials	2.53	0.98	Agree
8	AI is applied to make suggestion of new materials to acquire in library	2.39	1.08	Disagree
Cluster Mean		2.44	1.05	Disagree

Table 1 revealed that the mean ratings of respondents for items 1, 2, 3, 4, 5 and 8 are below the cut off mean of 2.50 indicating disagreement with the items as the application of artificial intelligence in delivery of acquisition service in academic libraries. The mean ratings of respondents for items 6 and 7 are above the cut off mean score of 2.50 indicating an agreement with the items. The cluster standard deviation scores of 1.05 indicates that there is homogeneity amongst their mean ratings. The cluster means of 2.44 which is below 2.50 indicated that artificial intelligence is not applied in delivery of acquisition service in academic libraries in public universities in South East, Nigeria.

The finding of the study revealed that artificial intelligence is not applied in delivery of acquisition service in academic libraries in public universities in South East, Nigeria. This agreed with the finding of Bakiri, Mbembati and Tinabo (2023) which revealed that AI was not adopted for rendering cataloguing services in academic libraries. The possible explanation for this finding could be that librarians have insufficient technical skills to apply artificial intelligence in delivery of acquisition service in academic libraries in public universities in South East, Nigeria. The application of AI in delivery of acquisition service in academic libraries require awareness and familiarity of operating some robotics, natural language processing and chatbots which many librarians are not conversant with the usage.

Research Question 2: What is the application of artificial intelligence in delivery of cataloguing service in academic libraries in public universities in South East, Nigeria?

Table 2: Mean Ratings and Standard Deviation Scores on the Application of Artificial Intelligence in Delivery of Cataloguing Service in Academic Libraries

S/ N	ITEMS	(n = 174)		
		Mean	SD	Decision
9	AI is applied to create comprehensive list of library materials	2.42	1.00	Disagree
10	AI is used to provide accurate details of authors of book	2.37	1.04	Disagree
11	AI is utilized to assign a unique number to each subject area	2.54	1.09	Agree
12	AI is applied to provide specific details of library materials	2.41	1.07	Disagree
13	AI arrange books based on type of publication	2.38	1.06	Disagree
14	AI is used in sorting books alphabetically according to the title of the entries	2.45	1.02	Disagree
15	AI applied keywords to organize information resources in the library	2.36	1.01	Disagree
Cluster Mean		2.42	1.04	Disagree

As shown in Table 2, the mean ratings of respondents for all items with exception of 11 are below the cut off mean of 2.50 indicating disagreement with the items as the application of artificial intelligence in delivery of cataloguing service in academic libraries. The cluster standard deviation scores of 1.04 indicates that there is homogeneity amongst their mean ratings. The cluster means of 2.42 which is below 2.50 indicated that artificial intelligence is not applied in delivery of cataloguing service in academic libraries in public universities in South East, Nigeria.

The result of the study showed that artificial intelligence is not applied in delivery of cataloguing service in academic libraries in public universities in South East, Nigeria. This affirmed the finding Bakiri, Mbembati and Tinabo (2023) which revealed that AI was not adopted for rendering cataloguing services in academic libraries. This is contrary to the finding of Kalbande et al (2024) which showed that AI was adopted in provision and automating cataloguing services in academic libraries. The disagreement between the findings could be attributed to difference in geographical locations as Kalbande et al (2024) was conducted in India that tend to be technological advanced than Nigeria, Artificial intelligence are not applied in delivery of cataloguing service probably due to slow internet connectivity and irregular electricity power supply in academic libraries in public universities in South East, Nigeria.

Research Question 3: What is the application of artificial intelligence in delivery of reference service in academic libraries in public universities in South East, Nigeria?

Table 3: Mean Ratings and Standard Deviation Scores on the Application of Artificial Intelligence in Delivery of Reference Service in Academic Libraries

S/ ITEMS	(n =174)
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N		Mean	SD	Decision
16	AI is used to provide users with suggested sites to check up on certain questions	2.45	1.03	Disagree
17	AI is adopted to leads patrons towards citation sources	2.40	1.00	Disagree
18	AI is utilized to provides advice to patron on utilizing references	2.42	1.11	Disagree
19	AI is applied to assist users with ag-related reference inquiries	2.35	1.02	Disagree
20	AI is used to helps individuals in finding materials on specific subject	2.43	1.09	Disagree
21	AI is used to offer suggestions on where to find references	2.38	1.01	Disagree
22	AI is applied to provide guide on how to reference materials			
Cluster Mean		2.41	1.04	Disagree

Table 3 indicated that the mean ratings of respondents for all items are below the cut off mean of 2.50 indicating disagreement with the items as the application of artificial intelligence in delivery of reference service in academic libraries. The cluster standard deviation scores of 1.04 indicates that there is homogeneity amongst their mean ratings. The cluster means of 2.41 which is below 2.50 indicated that artificial intelligence is not applied in delivery of reference service in academic libraries in public universities in South East, Nigeria.

It was discovered that artificial intelligence is not applied in delivery of reference service in academic libraries in public universities in South East, Nigeria. This contradicted the finding of Manik (2024) which indicated that AI is applied in reference services through searching queries to suggest new books, articles, or audiobooks that align with interests of patrons in academic libraries. The possible reason for the contradiction between the findings is dissimilarity in geographical location and participants of the studies. Artificial intelligence is not applied in delivery of reference service perhaps due to unavailability of

ICT facilities, technical hitches and insufficient supports to librarians in academic libraries in public universities in South East, Nigeria.

Recommendations

Based on the findings, the following recommendations were made:

1. University management should invest funds into annual training of librarians to enable them acquire skills and knowledge in application of artificial intelligence to improve service delivery in academic libraries.
2. Management of academic libraries should send librarians to professional courses to enable them update their competencies in the application of artificial intelligence to improve delivery of acquisition services in academic libraries.
3. Government should increase funding of universities to enable them procure ICT facilities to enhance the application of artificial intelligence to improve delivery of reference services in academic libraries.

Conclusion

Based on the findings, it is concluded that artificial intelligence is not applied in service delivery in academic libraries in public universities in South East, Nigeria. Some ICT facilities to apply AI tend to be unavailable and librarians appear to struggle to cope with application of the available ones in service delivery in academic libraries in public universities in South East, Nigeria. The laxities in application of artificial intelligence tend to slow down service delivery in academic libraries in public universities in South East, Nigeria. Thus, the application of AI into library services is required to redefine the

landscape of library operations and user experiences in academic libraries in public universities in South East, Nigeria.

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