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LIBRARIANS' AWARENESS AND ADOPTION OF ARTIFICIAL INTELLIGENCE-POWERED REFERENCE SERVICES FOR ENHANCING USER SUPPORT IN SOUTH-EAST, NIGERIA

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Abstract

The purpose of the study was to determine librarians' awareness and adoption of artificial intelligence-powered reference services for enhancing user support in South-East. Descriptive research design was utilized for the study. The population for the study consisted of 154 librarians in Federal university libraries in the South-East, Nigeria. The sample size for the study comprised 120 librarians that responded to the items in the instruments. Data for the study were collected using ''Librarians Awareness of AI-Powered Reference Services Questionnaire (LAWAIPRESQ)'' and ''Librarians Adoption of AI -Powered Reference Services Questionnaire (LADAIPRESQ). LAWAIPRESQ and LADAIPRESQ were validated by three experts. The reliabilities of LAWAIPRESQ and LADAIPRESQ were respectively ascertained using Kuder-Richardson-21 and Cronbach alpha statistics to yield scores of 0.81 and 0.71. Data collected were analyzed using frequencies, percentages, mean and standard deviation. The findings of the study revealed that librarians' were aware of AI-powered reference services for enhancing user support while their adoption of them was rare. In line with the findings of the study, it was recommended among others that university management should organize workshops and seminars for librarians to enhance librarians' skills in AI-powered reference services to enhance user support.

Keywords: Artificial intelligence, Reference services and User support

Introduction

University libraries in Nigeria seem to be witnessing a digital transformation in line with global trend driven by advancements in Artificial Intelligence (AI). This is a matter of necessity for University libraries as custodians of information to embrace the use of AI as part of their digitalization drive. Thus, AI presents a unique opportunity towards the transformation of library services in Nigerian universities. In the field of librarianship, AI is bringing about the needed revolution in the effective delivery of services to library patrons who, for the vast majority of cases, are digital natives.

AI entails the use of a technological platform to undertake tasks that ordinarily would have been undertaken using human intelligence. Accordingly, Udoh *et al*. (2024) defined AI as involving a facet of computer programming as well as technological development that highlights the degree of computers' performance in human-like intelligence tasks such as speech recognition, language translation, decision-making, visual perception, and expressing emotions like human beings. Similarly, Gupta and Mangla (2020) noted that AI is a creation of intelligent computer systems that mirror human-like behaviours. Within the context of the present study, AI represents digitally-powered tools that can be utilized by librarians for ease of operations; referencing inclusive. Tracing the evolving stages of the automation of university library, Memela (2023) averred that academic libraries transited from card system to computer to digitization to electronic resources to radio frequency identification (RFID) and to artificial intelligence (AI), which has raised the bar of effectiveness as well as efficiency of library services.

AI-powered tools can be employed in the classification of large amounts of electronic contents for users' ease of navigation. Similarly, Odigie (2024) asserted that AI-powered tools can automatically bring about the classification, tagging, and categorization of vast amounts of digital information anchored on prompts or commands; thereby easing users' navigation through complex collections. Furthermore, Odigie stated that these tools employ machine learning algorithms for analysis of metadata, text and users' interactions; thereby improving the precision and vitality of results from searches. Consequently, library patrons can make discoveries of vital resources more efficiently to their overall satisfaction with library services. AI-powered tools have the capacity to automatically generate research questions, hypotheses, identify keywords, and suggest related research materials; thereby considerably streamlining the research process. Other forms through which AI has

revolutionized library services are through the use of AI-driven chatbots and virtual assistants in libraries for the provision of instant guidance to users (Panda & Chakravarty, 2022).

Artificial intelligence has considerably impacted on the quality of service delivery in university libraries with the provision of virtual reference services. The relevance of reference services to library patrons who are predominantly digital natives has made the use of AI for their enhancement a matter of priority. More so, AI in libraries would improve library patron's experience while streamlining library processes through the adoption of auto-summarization tools for literature review, cataloguing and metadata enhancement, user support, virtual reference chatbots, among others (Shaheen & Khurshid, 2023). In similar vein, Sambo and Oyovwe-Tinuoye (2023) noted that AI-powered tools are been utilized for numerous library operations such as reference services for quality service delivery as well as online reference assistance. Additionally, Cox and Tzoc (2023) highlighted potential roles of ChatGPT in discovery and search, research assistance, reference services, textbook creation, copyright issues, plagiarism concerns, productivity enhancement, and inclusion considerations. It goes without saying that the relevance of AI-powered reference services in enhancing user support is far-reaching. However, Yang (2024) observed that much as ChatGPT are proficient in information retrieval in certain areas, it can hardly be compared with a reference librarian in others.

There are various benefits of using AI chatbots in reference services in university libraries towards enhancing user support. One of such benefits is that users will be able to naturally and easily engage in conversations while searching for vital information (Nawaz & Saldeen, 2020). Nawaz and Saldeen added that chatbots have the capacity to deliver a cost-effective way of responding to most routine reference queries while guiding users to the relevant service point. It is, however, curious to note that AI-powered reference services are not intended to replace humans or evade human interaction, but rather to enhance users' support and by extension, increase service output. It is interesting to note that some of the AI-powered tools that can be used for reference services to enhance users' support are AI enabled Chatbots virtual assistants, Machine Learning research tools, AI enabled reference interview bots, CoWriter and Auto-translation tools (Oghuvbu and Okoh, 2025). Similarly, Samue (2024) identified AHelp reference finder, Consensus, Semantic Scholar, Mendeley, Scite. Ai, Science.gov and ReadCube as seven AI reference service tools. AI-powered reference services will promote convenience in library users' conscious search for information

while dispelling library anxiety in the course of research. Strikingly, Al-Aamri and Osman (2022) libraries are already incorporating AI into reference services to enhance library users' access to information. However, it remains to be seen if librarians are aware of AI-powered reference services to adopt them especially in South-East, Nigeria given their poor adoption of AI-powered reference services to enhance user support as keenly observed by the researchers as librarians.

Awareness entails knowledge of the existence or availability of something. It refers to librarians' knowledge of AI technologies and their importance to their work, including comprehension of AI tools and their functions (Bawack *et al*., 2021). On the other hand, adoption is the use of something of which one is aware. It captures the actual utilization of AI tools like as LLM, ChatGPT, and virtual simulations, in various aspects of library operations, including user interfaces, data analysis, and information retrieval (Chen & Xiao, 2021). It is instructive to note that there is insufficiency in AI integration into educational curricula in Nigeria, leading to awareness that may hinge more on individual efforts than institutional support (Ofem *et al*., 2024).

There is apparent variability in the literature on AI awareness levels. For instance, while some studies reported high awareness (Dessy Harisanty *et al*., 2022; Khanagar *et al*., 2021), others indicated low awareness (Yelena *et al*., 2022). These inconsistencies highlight a gap in the evidence and by extension, suggest the necessity for further research with a view to providing a comprehensive comprehension of AI awareness in various contexts (Ofem *et al*., 2024c). Bisht (2023) and Yakubu (2023) pointed out that factors such as AI awareness, acceptance, adoption experience, innovation atmosphere, and competitive pressure impact on a library's readiness to adopt AI.

Librarians' awareness of the AI-powered reference services is bound to influence their adoption of them to enhance users' support. Similarly, librarians' awareness of AI's relevance often affects their acceptance (Bawack *et al*., 2021), and acceptance can influence the application of AI tools (Dunn & O'Brien, 2021; Alam *et al*., 2024). Lending credence to the afore-mentioned, Edam-Agbor *et al*. (2025) found high librarian's levels of awareness and use of AI in research library service delivery. In contrast, Yusuf *et al*. (2022) found that librarians were aware of the integration of AI systems in libraries globally, but they possess mixed feelings about the readiness of academic libraries for their adoption. In similar vein, Ajani *et al*. (2022) found that while Nigerian academic libraries were aware of the adoption of artificial intelligence (AI) in libraries around the world, they were not yet fully equipped to integrate the

technology into their regular operations. More so, Odigie (2024) found that while reference librarians demonstrated a substantial awareness of AI tools such as ChatGPT and Gemini, their application remained primarily for personal use rather than delivery of professional services within libraries. Furthermore, Oyetola *et al*. (2023) found minimal AI application in Nigerian libraries. Apparently, there is paucity of research works specifically examining extent of librarians' utilization of AI-powered reference services in enhancing user support in South-East, Nigeria. This gap, to all intents and purposes, limits policy development and by extension, the integration of AI into library curricula tailored towards digitalization (Cox & Mazumdar, 2022). This gave impetus to the present study.

Purpose of the Study

The purpose of the study was to ascertain librarians' awareness and adoption of artificial intelligence-powered reference services in enhancing user support in South-East. Specifically, the study sought to determine;

1. librarians' awareness of artificial intelligence-powered reference services for enhancing user support in South-East.
2. librarians' extent of adoption of artificial intelligence-powered reference services for enhancing user support in South-East.

Research Question

The following research questions were formulated to guide the study:

1. What artificial intelligence-powered reference services are librarians aware of for enhancing user support in South-East?
2. To what extent do librarians adopt artificial intelligence-powered reference services for enhancing user support in South-East?

Methodology

Research Design. Descriptive research design was be utilized for the study. The justification for the use of descriptive research design was anchored on the basis of the definition of Nworgu (2015) that descriptive surveys refer to those studies which are focused on data collection and description in a systematic manner; the characteristics and facts about a given population.

Procedure. The population for the study consisted of 154 Librarians which included: 32 librarians from Nnamdi Azikiwe University Library, 24 Librarians from Michael Okpara University library, 44 Librarians from University of Nigeria, Nsukka Library,

Nsukka, eight Librarians from Alex Ekwueme Federal University Library, Ebonyi State, 46 Librarians from Federal University of Technology, Owerri library in the South-East Nigeria. The sample size for the study comprised 120 librarians that responded to the items in the instruments. Data for the study were obtained using ''Librarians Awareness of Artificial Intelligence-Powered Reference Services Questionnaire (LAWAIPRESQ)'' and ''Librarians Adoption of Artificial Intelligence-Powered Reference Services Questionnaire (LADAIPRESQ)''. LAWAIPRESQ is a seven-item questionnaire constructed by the researcher from literature. The construction of LAWAIPRESQ was done in such a way that the participants responded by choosing one of the two response options of Aware/Not Aware with cut-off point of 50%. LADAIPRESQ is a seven-item questionnaire constructed by the researcher from literature. The construction of LADAIPRESQ was done in such a way that the participants responded by choosing one of the four response options of Very Often Adopted (VOA), Often Adopted (OA), Rarely Adopted (RA) and Never Adopted (NA) with numerical indices of 4, 3, 2 and 1 respectively. LAWAIPRESQ and LADAIPRESQ were validated by three experts in Faculty of Education, Nnamdi Azikiwe University, Awka. The reliability of LAWAIPRESQ was ascertained using Kuder-Richardson-21. This was achieved by administering the LAWAIPRESQ to 20 librarians in University of Benin, Edo State. This university is not within the area of study, but has the same characteristics with the study population. Kuder-Richardson Formular 20 was utilized to measure the internal consistency reliability of the test scores for the LAWAIPRESQ. This statistical technique was utilized because the items in LAWAIPRESQ were dichotomously scored (either Aware = 1 or Not Aware = 0). Reliability index of 0.81 was obtained and considered reliable it aligns with the suggestion of Nworgu (2015) that an instrument is reliable when its reliability co-efficient is above 0.80 for quantitative research. The reliability of LADAIPRESQ was established using Cronbach alpha method. The use of Cronbach alpha method was because the items in the LADAIPRESQ are polytomously scored. The internal consistency of the items in LADAIPRESQ was determined using Cronbach statistics. The alpha coefficient obtained was 0.71, which indicates a high level of reliability for the LADAIPRESQ as it is in consonance with the recommendation of Shrestha (2021) that the adequate threshold value for Cronbach alpha should be >0.70. 10 research assistants were used by the researcher to cover the five states of the South-East, Nigeria. Out of the 154 copies of LAWAIPRESQ and LADAIPRESQ administered, 120 were retrieved; indicating 77.9% return rate.

Data Analysis. Data from research question one were analysed using frequencies, percentages, mean and standard deviation. The decision rule was that any percentage score of 50 and above was taken as aware while percentage score below 50 was taken as not aware. Data from research question two were analyzed using mean and standard deviation in line with the real limit of numbers as presented thus VOA (3.49-4.00), OA (2.50-3.49), RA (1.50-2.49) and NA (1.00-1.49).

Results

Research Question 1: What artificial intelligence-powered reference services are librarians aware of for enhancing user support in South-East

Table 1: **Frequencies and Percentage Score of Librarians' Awareness of Artificial Intelligence-Powered Reference Services for Enhancing User Support in South-East, Nigeria**

	Aware		Not Aware		
	Freq	**%**	**Freq**	**%**	**Decision**
1. AHelp reference finder.	38	31.67	82	68.33	Not Aware
2. Consensus.	60	50.00	60	50.00	Aware
3. Semantic Scholar.	77	64.17	43	35.83	Aware
4. Mendeley.	95	79.17	25	20.83	Aware
5. Scite. Ai.	42	35.00	78	65.00	Not Aware
6. Science.gov.	84	70.00	36	30.00	Aware
7. ReadCube.	51	42.50	69	57.50	Not Aware

Data in Table 1 shows the frequency and percentages of the librarians' aware of AI-powered reference services for enhancing user support in South-East. It indicates that while majority of the respondents are aware of Consensus, Semantic Scholar, Mendeley and Science.gov as AI-powered reference services for enhancing user support in South-East, few are aware of AHelp reference finder, Scite. Ai and ReadCube as AI-powered reference services for enhancing user support for South-East. Overall, librarians are aware of Consensus, Semantic Scholar, Mendeley and Science.gov as AI-powered reference services for enhancing user support in South-East, Nigeria since they have percentage values above 50.

Research Question 2: To what extent do librarians adopt artificial intelligence-powered reference services for enhancing user support in South-East

Table 2: Mean Ratings on the Extent of Adoption of Artificial Intelligence-Powered Reference Services for Enhancing User Support in South-East, Nigeria

S/N		VOA	OA	RA	NA	Mean	SD	Remark
1.	AHelp reference finder.	04	06	10	100	1.28	.50	NA
2.	Consensus.	15	16	22	67	1.83	.67	RA
3.	Semantic Scholar.	26	20	15	58	2.10	.73	RA
4.	Mendeley.	54	22	35	09	3.08	.91	OA
5.	Scite. Ai.	10	04	06	100	1.36	.52	NA
6.	Science.gov.	10	02	18	90	1.43	.56	NA
7.	ReadCube.	08	10	15	87	1.49	.59	RA
	Grand Mean					**1.80**	**.64**	**RA**

Table 2 points that Mendley is often adopted by librarians as AI-powered reference service for enhancing user support. Again, while Consensus, Semantic Scholar and ReadCube are rarely adopted by librarians as AI-powered reference service for enhancing user support, AHelp reference finder, Scite. Ai and Science.gov are never adopted by librarians in enhancing user support. The grand mean of 1.80 shows that AI-powered reference services are rarely adopted by librarians in enhancing user support. The standard deviation score ranging from 0.50 – 0.91 means that the respondents vary much in their ratings on their adoption of AI-powered reference service in enhancing user support in South-East, Nigeria.

Discussion

The findings of the study on librarians' awareness of artificial intelligence-powered reference services for enhancing user support in South-East indicated that librarians were aware of Consensus, Semantic Scholar, Mendeley and Science.gov. This may be attributed to the fact that librarians are open to recent development on AI-powered reference services. It can further be attributed to the fact that within the university community, a good number of librarians are digital natives. In consonance with the finding of the present study, Edam-Agbor *et al*. (2025); Yusuf *et al*. (2022) found high librarian's level of levels of awareness of AI in research library service delivery. In further agreement with the present study, Odigie (2024) found that reference librarians demonstrated a substantial awareness of AI tools such as ChatGPT and Gemini. The foregoing findings point to the fact that librarians are knowledgeable about the existence of AI-powered reference services in enhancing user support in South-East.

The finding of the study, is however, contrasted by that of Yelena *et al*. (2022) that there was low awareness of AI among librarians. The afore-mentioned contrast may not be separated from variability in sample characteristics.

Furthermore, research conducted on librarians' adoption of artificial intelligence-powered reference services in enhancing user support in South-East reviewed that librarians rarely adopted AI-powered reference services in enhancing user support in South-East. This highlights a gap between knowledge and application. This gap could be attributed to some challenges such as inadequate infrastructure, poor digital literacy skills and epileptic power supply. In line with the finding of the present study, Oyetola *et al*. (2023) found minimal AI application in Nigerian libraries among librarians. In other words, librarians did not see the adoption of AI in Nigeria libraries, a matter of necessity in enhancing user support. Similarly, Odigie (2024) found that application of AI tools remained primarily for personal use rather than delivery of professional services within libraries. This is to say that librarians have failed to prioritize the adoption of AI-powered reference service for delivery of professional services to the satisfaction of library users. In contrast to the finding of the present study, Edam-Agbor *et al*. (2025) found high librarian's level of use of AI in research library service delivery. The contradiction in findings could be associated with variations in librarians' backgrounds, experience and exposure to AI technologies. It could further be linked to library types, location and available resources.

Conclusions

Librarians' awareness of AI-powered reference services is notable but the adoption is militated against by considerable challenges such as insufficient training and disruption to traditional library services. Thus, to harness the transformative potentials of AI-powered reference services, targeted interventions are critical to addressing the afore-mentioned challenges.

Recommendations

In view of the findings of the study, the following recommendations were made:

1. Librarians should sustain their awareness of AI-powered reference services to enhance user support.
2. University management should organize workshops and seminars for librarians to enhance librarians' skills in AI-powered reference services to enhance user support.
3. Ministry of Education should provide infrastructural support to librarians to support AI adoption, including reliable internet connectivity.

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