

AWARENESS OF ARTIFICIAL INTELLIGENCE FOR REFERENCE SERVICES AMONG LIBRARIANS IN DELTA STATE UNIVERSITY LIBRARY, ABRAKA

By

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Abstract

The aim of this study was to critically analyze the Awareness of Artificial Intelligence for Reference Services among Librarians in Delta State University Library, Abraka as case study. The study adopted the descriptive survey design to gather, opinions of the librarians in Delta state university library. The population of the study consists of Sixty Three (63) Librarians and paraprofessionals in Delta State University, Library. A total enumeration sampling technique was employed in order to allow all the targeted population to participate in this study. The instrument for the study was a structured questionnaire which was administered to the participants and the results revealed that while awareness levels are moderate to high, the actual integration of AI in reference services remains limited. The study recommends capacity-building programs and infrastructural investments to enhance AI utilization in academic libraries.

Keywords: Artificial Intelligence, Use, Reference Services, Awareness, AI Academic Libraries

Introduction

Libraries are service-oriented institutions dedicated to acquiring, collecting, organizing, and disseminating information across various formats, including print, audio, video, and digital (Krishan, 2017). Their primary functions are three-fold: Acquisition: Gathering diverse documents and materials (Intner & Gurin,' 2015), Organization: Processing and: categorizing materials for efficient retrieval (Taylor & Joudrey, 2017) and Dissemination: Providing access to acquired information through various tools, such as catalogs, shelf lists, and bibliographies (Chan & Salaba, 2016). Reference services play a crucial role in fulfilling the dissemination function (American Library Association, 2020). To effectively utilize reference sources, considerations include: Selecting the right source, understanding types of reference sources and locating sources (now readily available on the Web).

Reference service, is the process of helping readers to identify sources of information in response to a particular query, problem or assignment to be done. In as much as reference services help readers, researchers in identifying information resources and materials there are

still some problems faced with reference services delivery, some of them can be pinned down to lack of time and time management, this is seen as the biggest challenge, in providing reference services to information users. However we know that time is our most precious asset so we need to organize and plan how much time that is been spent when rendering services to patrons in order for them not to lose interest in library services. ((Kvenild & Ciliberti, 2019)

Evaluating reference services is crucial to ensure they meet user needs, improve service quality, inform resource allocation and policy decisions, identify gaps and training needs, and demonstrate accountability, ultimately enhancing the overall effectiveness of the library. Evaluating reference services rendered in a library involves assessing the quantity and impact of reference transactions, user engagement, and resource utilization to determine the effectiveness of reference services in meeting user needs." (Kvenild & Ciliberti, 2019)

With the help of advancements in technology, the integration of these technologies in library operations has revolutionized traditional practices, enabling libraries to adapt to the evolving needs of users in the digital age. The relevance of technologies embedded services and their application among librarians is to make them more effective in the delivery of various library operations (Agbo & Eyinnah, 2022). The intersection of artificial intelligence and library operations heralds a new chapter in the evolution of these vital technologies, promising enhanced efficiency, accessibility, and user experiences.

In this study, the concept of reference service implies the in person assistance rendered by librarians, especially the reference librarian, to patrons in order to deliver the right information while responding to specific users inquiries, be it through face-to-face encounter, or interactions via telephone, email, or online platforms. Such services tend to involve direct question-and-answers, providing guidance on proper usage of information sources, search strategies, and proper referrals to external resources when needed. Hence, in this research, reference service was measured in terms of availability, satisfaction of users, and competence of the reference librarians, response time, and use of digital tools in responding to user needs.

Artificial Intelligence (AI) technologies are now being used in libraries to support and render library services. The adoption of artificial intelligence can improve library services and provide access to accurate information that can drive growth and development in this information age. In the library, artificial intelligence can be used to develop programs for

effective reference services, — of textbooks, and the identification of appropriate * subject categories (Tella, 2020). Furthermore, AI technologies can assist library users on how they can locate library materials through intelligent tutoring system and automated library services (Tella, 2020). Therefore, AI adoption and use in libraries will allow better information processing, and at the same time, better information search that will excite both library personnel and users giving easier and faster access to information. AI technologies are being adopted in libraries throughout the world for a wide array of purposes such as everyday service delivery (IFLA-FAIFE, 2020). AI is defined as the simulations of human intelligence in computers that are trained to think and act like humans. The phrase can also refer to any machine that demonstrates human-like characteristics like learning and problem-solving (Frankenfield, 2021). Artificial intelligence integration in university libraries operations offers numerous benefits and advantages.

AI innovations in the library will increase academic librarians' job performance and better user satisfaction.” Highlighted by Owolabi et al., (2021) as one of the various advantages of using AI in library operations. AI is being used to guide, and support library activities and operations, and at the same time user-friendly, particularly in information search among other benefits derived from the adoption AI in libraries (Yusuf et al., 2022).

Statement of the Problem

Libraries have always been viewed as an institution that promotes access to information and knowledge. Delivering reference services can be a complex process, and issues may arise. Some common challenges include, difficulty finding accurate or up-to-date information, trouble accessing relevant resources or databases, struggling to provide timely and efficient service, communicating effectively with patrons or clients, staying current with changing information needs and technologies. All this are some of the challenges faced in reference services delivery and it reduces the effectiveness and usefulness of the reference services in the library and the library may not be able to meet the academic and research needs of it users, with the help of artificial intelligence in. rendering reference services these challenges would be limited and it would enhanced user experience, increased efficiency, improved accessibility, availability, scalability, consistency, data analysis, personalized recommendations, language support, and

cost-effectiveness, ultimately leading to improved user satisfaction and enhanced reference services.

Research Questions

The following research questions were raised to guide the study:

1. To what extent are reference services rendered in the library?
2. What is the level of awareness on the application of artificial intelligence to reference services?

Literature Review

Reference Services

Reference services in libraries are a vital component of information support, catering to the diverse needs of patrons, from academic researchers to casual users. The extent to which these services are provided has expanded over the years, influenced by advancements in technology, changes in user expectations, and the increasing availability of digital resources. Traditionally, libraries have offered face-to-face reference services at a designated reference desk, where patrons can directly interact with librarians for assistance in locating materials or conducting research. However, the rise of digital platforms has transformed how reference services are delivered, increasing both their accessibility and complexity.

An empirical study by Sadeghi and Khodayari (2019) investigated the extent to which reference services are rendered in academic libraries in Iran. Traditional reference services were primarily based on in-person interactions, where librarians provided assistance in locating resources, answering factual questions, and guiding users through library systems and databases. As Green (2019) highlights, these services were often reactive, with patrons initiating contact for help with immediate needs. In many academic libraries, reference desks were the central point of contact for students and researchers seeking guidance on using the library's catalog, finding books, or accessing journals. These services typically included helping with bibliographic searches and offering instructional sessions on how to navigate library resources” effectively. A study by Shapiro and Hughes (2011) found that traditional reference services continue to be valued by library patrons, particularly for complex queries that require expert assistance. Their research highlights that while digital resources have expanded the options available to users;

many still prefer the personalized guidance and expertise offered by traditional reference services, underscoring the enduring importance of these services in the evolving landscape of information access.

With the digital shift, libraries have increasingly turned to Virtual Reference Services to meet the needs of a growing population of remote users. Virtual reference involves offering reference services through digital platforms such as email, chat, video conferencing, or online forms. According to Kwon and Gregory (2021), VRS | significantly extend the accessibility of reference services, allowing users to seek assistance from anywhere and at any time. This is particularly beneficial for academic libraries that support distance learners and researchers who may not have access to the physical library.

Chat-based reference services have become especially popular, enabling real time interactions between librarians and users. Studies by Radford and Connaway (2020) suggest that users appreciate the convenience of getting immediate answers to their queries, especially for routine questions about locating materials or navigating library * websites. In some instances, libraries have also integrated AI-powered virtual assistants or chatbots to handle common inquiries, freeing up librarians to focus on more complex research tasks (Feng & Deng, 2022). Despite these advancements, human librarians still play a critical role in virtual reference services, particularly for more nuanced or in-depth, research support, where personalized guidance is essential.

Another significant development in the provision of reference services is the use of collaborative and embedded models. Collaborative reference services involve partnerships between libraries, where users from one institution can receive reference assistance from librarians at another. This approach helps expand the range of expertise available to patrons, especially in subject-specific inquiries where specialized knowledge is required (Singh & Mahajan, 2021). For example, large academic institutions may participate in consortia that offer reference services across multiple campuses or libraries pooling resources and expertise.

Embedded librarianship is another growing trend, particularly in academic environments. In this model, librarians are integrated into academic departments or research teams, providing tailored reference and research support directly within the users' environment.

According to Booth and Lowe (2021), embedded librarians often collaborate closely with faculty and students, participating in research projects, offering targeted bibliographic instruction, and even co-authoring research papers. This proactive and integrated approach to reference services ensures that users receive highly specialized and; contextual support, enhancing the overall quality of the library's contribution to academic SUCCESS.

Reference services are usually broken into traditional which requires face-to-face interactions and the virtual reference services (VRS) done via mail, chat, and video consultations (Ronan, 2015). Studies have shown that users expect reference services to be timely, accurate, and tailored to the specific needs of users. However, there are discrepancies between user expectations and what libraries deliver. According to Luo (2008), students always prefer personalized and fast responses, more so in virtual environments. Hence, there is need for libraries and librarians to constantly adapt their services to meet the dynamic expectations of the patrons of the digital-era. It has been continually emphasized in studies that reference services need to be evaluated via the lens of user satisfaction. For instance, Dada and Shuaibu (2019) reported that students in universities get satisfaction from reference services that are deployed through techs such as WhatsApp and email. How effective reference services are depends on the competence and communication skills of the librarians delivering them. Deep knowledge of resources, digital search skills, and interpersonal abilities are crucial. Hence, training and continuous professional development are needed to ensure that librarians can handle increasingly complex queries (Nwokocha & Okeke, 2021).

A study conducted by Hsieh and Chiu (2020) revealed that students who participated in embedded librarian programs reported improved research skills and greater confidence in navigating academic resources compared to those who utilized traditional reference services. These findings highlight the effectiveness of collaborative efforts in integrating information literacy into the curriculum and supporting student success through personalized, context-rich guidance.

As artificial intelligence (AI) becomes more prevalent in library operations, its integration into reference services is also increasing. AI technologies, such as chatbots, machine learning algorithms, and natural language processing (NLP), have transformed how libraries

handle user inquiries. According to Luo and Zhou (2022), AI-powered tools can efficiently manage routine queries—such as locating books, accessing online databases, or answering frequently asked questions—allowing librarians to focus on more complex tasks. These tools can operate 24/7, ensuring that patrons can receive immediate assistance even when the library is closed.

However, while AI tools enhance the efficiency of reference services, they are not without limitations. Many complex research queries still require human intervention, especially when the question involves critical thinking, ethical considerations, or highly specialized knowledge. Hooland and Verberne (2023) caution that while AI can streamline reference services, it must be integrated thoughtfully to ensure that it complements rather than replaces the expertise of human librarians.

5. Reference Services and Information Literacy

Beyond answering queries, modern reference services are increasingly linked to information literacy instruction. Libraries now offer workshops, tutorials, and one-on-one consultations aimed at improving users' ability to find, evaluate, and use information effectively. Information literacy is essential in academic settings, where students must navigate complex research databases and critically assess sources for their projects. According to Johnson et al. (2020), librarians play a key role in teaching these skills, often through formal instructional sessions or integrated into reference services. This not only supports the immediate research needs of users but also helps them become more independent and efficient in their future research endeavors.

The future of reference services in libraries is likely to continue evolving alongside technological advancements and changing user behaviors. According to Feng and Deng (2022), libraries must continuously adapt to the digital landscape by enhancing their ' virtual reference services, integrating more AI tools, and fostering collaborative networks that extend beyond institutional boundaries. Additionally, the growing demand for data management services, digital humanities support, and research impact assessments means | that reference services will need to expand to cover new areas of expertise, ensuring that libraries remain essential hubs of knowledge and support in the academic world.

Artificial Intelligence

Artificial intelligence (AI) is revolutionizing multiple sectors, including academic libraries, where it is increasingly being integrated into reference services. Despite the transformative potential of AI in enhancing efficiency, automating routine tasks, and improving service delivery, the level of awareness about its applications remains varied.

In academic libraries, both librarians and users often possess differing levels of understanding regarding AI's capabilities and limitations, which affects its adoption and utilization. Raising awareness about AI's role in reference services is essential for harnessing its full potential and ensuring its effective deployment in library settings.

Librarians, as the primary facilitators of reference services, must have a comprehensive understanding of AI tools to effectively integrate them into their workflows. Recent studies suggest that awareness of AI's application among library professionals is growing, but there are still significant gaps in knowledge, particularly regarding its practical implications. According to Zhou and Zhang (2022), while many librarians are familiar with the general concept of AI, fewer are aware of the specific ways AI can be applied to enhance reference services. For example, AI-powered chatbots, virtual assistants, and machine learning algorithms can help automate routine inquiries, provide 24/7 service, and offer personalized recommendations based on user behavior. However, many librarians lack the technical expertise to implement or fully utilize these tools, which limits their integration. As Luo and Deng (2021) point out, increasing awareness among librarians requires targeted training initiatives that demystify AI technologies and demonstrate their practical applications in everyday library operations.

Library users, including students, researchers, and faculty, are another critical group whose level of awareness affects the successful deployment of AI in reference services. Studies have shown that many users are unaware of the AI tools integrated into library services or how to interact with them effectively. For example, Othman and Hashim (2023) report that while academic libraries may offer AI-powered chatbots or virtual reference assistants, many users continue to rely on traditional forms of interaction with librarians, either due to a lack of awareness or discomfort with using AI technologies.

This gap highlights the importance of user education in promoting AI's role in reference services. To address this issue, many libraries have begun implementing awareness campaigns that aim to educate users about AI tools available for reference services. This includes

integrating AI demonstrations into library orientation sessions, offering online tutorials, and providing informational materials that explain how AI can enhance the research process. As Hamid and Zainal (2022) suggest, promoting user awareness is essential for fostering acceptance and encouraging more widespread use of AI-powered services.

Libraries that actively engage in promoting their AI tools often see higher levels of user interaction with these technologies, leading to more efficient and personalized reference services. Despite the growing recognition of AI's potential, several barriers impede the widespread awareness and adoption of AI in reference services. One of the primary obstacles is the technological divide that exists in many academic libraries, particularly those in developing countries. As Nguyen and Pham (2022) note, libraries in regions with limited access to advanced technologies and infrastructure face significant challenges in adopting AI tools. This lack of access directly impacts the level of awareness among both staff and users, as they may not have the opportunity to engage with AI technologies in their daily interactions.

Another critical barrier is the concern about AI's implications for job security among librarians. According to a study by Smith and Jones (2023), many library professionals are apprehensive about AI replacing traditional reference roles, leading to resistance in adopting these technologies. While AI is intended to complement human librarians by automating routine tasks, the perception that it might render some positions obsolete has led to reluctance in learning and integrating AI tools. This perception underscores the importance of framing AI not as a replacement for human expertise but as a tool that enhances the scope and efficiency of reference services.

Improving awareness of AI applications in reference services requires a multi-faceted approach involving training, user education, and institutional support. For library staff, continuous professional development programs that focus on AI technologies are crucial.

Libraries must invest in workshops, certifications, and hands-on training that allow librarians to understand the potential and limitations of AI tools (Radford & Connaway, 2023). Additionally, creating collaborative networks where librarians can share best practices and experiences with AI integration can help build a stronger foundation of knowledge and expertise.

For users, libraries should incorporate AI awareness into their instructional services. This could involve hosting workshops, creating online tutorials, and embedding AI demonstrations

into library orientation programs. As Zhou and Zhang (2022) suggest, fostering a user-centered approach that highlights the benefits of AI for specific research tasks such as literature searches, data analysis, or citation management can significantly increase engagement with these tools.

Methodology

In this study, employed the descriptive research design to investigate the awareness of artificial intelligence for reference services among librarians in Delta State University library, Abraka. This design was selected to facilitate the objective description and collection of data from respondents without researcher manipulation. The choice is grounded in the principles of objectivity, completeness, and the provision of a sound basis for efficiency and accuracy in decision making (Arumuru, 2015). The study's population is sixty three (63) Librarians and paraprofessionals in Delta State University, Library. The total enumeration sampling technique was employed in order to allow all the targeted population to participate in the study.

For data collection, a structured questionnaire title "Awareness of Artificial Intelligence for Reference Service". Data collection involves the personal administration of the questionnaire by the researcher directly to respondents. Copies of the questionnaire were collected from respondents to ensure a high response rate. The simple percentage method was applied to calculate the proportion of responses for each category by dividing the frequency of responses by the total number of responses and multiplying by 100. The formula is shown below:
$$\frac{\text{Number of responses}}{\text{Total number of respondents}} \times 100$$

Results

Research Question 1: To what extent are reference services rendered in the library?

Table 1: Extent to which reference services are rendered in the Library

ITEM	VHE (%)	Freq .	HE (%)	Freq	ME (%)	Freq	LE (%)	Freq
The extent to which you access references services in your library	39.7	25	31.8	20	19.1	12	9.5	6
The extent to which reference services are helpful for your academic work	60.3	38	23.8	15	11.1	7	4.8	3

The extent to which you are satisfied with the availability of reference services in the library	27.1	17	44.4	28	3.2	2	24	15
	1		4					
The extent to which reference services are accessible during non operational hour (e.g., night, weekends)	0	0	0	0	0	0	100	63
The extent to which librarians are responsive to your reference inquiries	30.2	19	19.1	12	27.1	17	23.8	15
	2		1					

Table 1 shows the extent reference services rendered in the Library. The table shows that majority of the respondents agreed with the item to a Very High Extent 25(39.7%), while those who agreed to a High Extent are 20(31.8%), On the issue of the helpfulness of such services to them majority of them 38(60.3%) thought very highly of reference service. 15(23.8%) went with a high extent. Also, 17(27.1%) and 28(44.4%) claimed that the extent of satisfaction they derive from reference services provided in the library is very high and high respectively. While on the extent of accessibility to reference service during non operational hours, the table ironically tilted against as majority of or all the respondents 63(100%) strongly denied having such access. On the extent of librarians responsiveness to reference inquiries, a combined response of those who choose VHE 19(30.2%), and high extent 12(19.1%) indicates that librarians' were very much responsive, Hence we can conclude that reference services are rendered on a hangs between moderate to very high level in the library except on weekends.

Research Question 2: What is the level of awareness on the application of artificial intelligence to reference services?

Table 2: Level of awareness of the application of artificial intelligence to reference services

ITEM	VHE (%)	Freq	HE (%)	Freq	ME (%)	Freq	LE (%)	Freq
I am familiar with the concept of	19.5	12	20.6	13	17.5	11	14.3	9

artificial intelligence								
I am aware that my library utilizes AI for reference services (e.g. charbots, visual assistant)	11.1	7	23.8	15	27.1	17	38.1	24
I am informed about the role AI plays in enhancing reference services in the library	33.3	21	22.2	14	15.9	10	28.6	18
Library staff have adequately explained the application of AI in reference services	15.9	10	28.6	18	14.3	9	41.3	26
I have encountered AI drive tools during my interaction with the library's reference services	9.5	6	19.1	12	27.1	17	44.4	28

Table 2 shows the level of awareness of the application of artificial intelligence to reference services. The table shows that majority of the respondents to a very high extent 12(19.5%), and a high extent 13(20.6%) are familiar with the concept of AI. This is even though majority of them 17(27.1%) and LE 24(38.1%) are not aware or uncertain of whether their library utilizes same for reference service on not. On the role played by AI in reference service the majority of them 21(33.3%), and 14(22.2%), believe that they are very much aware of the role of AI in rendering reference services in library. Also majority of the respondents rejected the notion that library staff adequately explained the application of AI to reference services in libraries 9 (14.3%) and 26(41.3%). The respondents also rejected the idea of having encountered AI driver tools while interacting with the reference librarian 17(27.1%), 28(44.4%). Hence we can conclude that level of awareness on the application of artificial intelligence to reference services is to a large extent limited.

Recommendations

1. **Increase Awareness and Education:** Libraries should invest in training and awareness programs for both library staff and users to enhance understanding of AI technologies and their potential applications in reference services. Workshops, webinars, and informational sessions can help demystify AI and encourage its adoption.
2. **Pilot AI Integration:** Academic libraries could begin with pilot projects to integrate AI tools into their reference services. These pilots would allow libraries to assess the effectiveness and user satisfaction of AI-driven services, such as chatbots or virtual assistants, before wider implementation.
3. **Collaboration with AI Developers:** Libraries should collaborate with AI developers to tailor solutions that address specific academic library needs. This includes developing AI systems that are contextually aware of academic research needs and library collections.

Conclusions

In conclusion, the awareness of artificial intelligence (AI) for reference services in academic libraries demonstrates both significant potential and challenges. While there is growing recognition of AI's capabilities to enhance library services such as improving information retrieval, automating responses, and providing personalized assistance many academic libraries still face barriers in fully integrating AI technologies. Factors like staff training, resource allocation, and concerns over data privacy and AI's impact on traditional reference roles need to be addressed for broader adoption. Furthermore, while students and faculty show an increasing interest in AI-driven services, there is variability in understanding how AI can be applied effectively in the library context. For AI to be fully embraced, academic libraries must focus on increasing awareness, enhancing technical infrastructure, and fostering collaboration between library staff, AI developers, and users. By doing so, libraries can maximize the potential of AI to support efficient, user-centered reference services in the evolving landscape of academic information management.

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