

Librarians' Awareness Level And Adoption Of Artificial Intelligence Tools For Teaching And Assessment In Universities

Victoria Chukwu Nwali. Ph.D, CLN.
Ebonyi State University Library Abakaliki, Ebonyi State

Abstract

The study was to assess librarians' awareness level and adoption of Artificial Intelligence tools for teaching and assessment in federal universities in south East of Nigeria. Two research questions guided the study. Descriptive survey research design was employed. The population comprised all the sixty (60) Librarians in the six federal Universities in south East of Nigeria. The sample is made up 60 librarians using consensus sampling technique. Data was collected using questionnaire titled Librarians' Awareness and Adoption of Artificial Intelligence Tools for Teaching and Assessment in Universities (LAAAITTAU). The questionnaire was validated by two experts in Measurement and Evaluation and one expert in library and information science. The reliability coefficient of 0.88 was established using Cronbach Alpha. Mean and Standard Deviation were used to answer the research questions. Findings from the study showed that librarians have high-level awareness of AI tools for teaching and assessment but low adoption AI tools in their instructional activities. The study recommended that, universities administrators should organize workshops, training sessions and online courses to deepen librarians' knowledge and understanding of AI tools and how they can be effectively applied in teaching.

Keywords: Librarians, Awareness, Artificial Intelligence Tools, Teaching and Assessment

Date of Submission: 16-07-2026

Date of Acceptance: 26-07-2026

I. Introduction

University libraries play an important role in the academic life of a university, providing essential resources and services that support teaching, learning, and research. They are often central to the academic experience of students and faculty, and are an important part of the intellectual and cultural life of the university community. A university library is a specialized library that serves the students, faculty, and staff of a university or college. According to the International Federation of Library Associations and Institutions (IFLA), a university library is a library which supports the teaching, research and administrative functions of a university or college, and which may also serve as a resource for the wider community (IFLA, 2015). Libraries are the nerve center of an educational institution and a place where information is provided to serve all patrons irrespective of their ages, political and ethical background, religion, sex, etc. The transition of information materials from book collections to audiotape collections, video collections, database, digitization of information materials, library automation, and now with the introduction of new technologies including Artificial Intelligence (AI) are increasingly becoming a major force in contemporary society. It touches almost all areas of our endeavours, including the library and information centres and for delivery of information services. The integration of Artificial intelligence (AI) in education library has introduced dynamic changes, shifting from traditional, teacher-centered methods to more interactive and learned-focused approaches.

Artificial intelligence refers to the branch of computer science dedicated to creating systems capable of performing tasks that typically require human intelligence. These tasks include learning from experience, understanding natural language, recognizing patterns, solving complex problems, and making decisions. AI has permeated higher education through automated feedback, intelligent tutoring systems, and adaptive learning environments (Holmes et al., 2022). These advancements encourage educators including librarians to leverage AI to enhance teaching efficiency and learning outcomes. Artificial intelligence encompasses various subfields such as machine learning, which focuses on algorithms that enable systems to learn from data and improve over time without explicit programming. Another important area is natural language processing, which allows machines to understand and interact using human language (Russell & Norvig, 2020). This artificial intelligence can be categorized into two main types: narrow artificial intelligence and general artificial intelligence. Narrow artificial intelligence, also known as weak Artificial Intelligence is designed to handle a specific task, such as voice assistant or recommendation systems. However, general artificial intelligence, or strong artificial intelligence aims to perform any intellectual task that a human can do, though this level of artificial intelligence remains largely theoretical (Tegmark in Akhimien & Osawe, 2014).

Artificial intelligence is used in various applications across different fields. For instance, in healthcare, artificial intelligence algorithms assist in diagnosing diseases by analyzing medical images and patient data (Esteve et al., 2019). In the finance sector, artificial intelligence systems help in fraud detection and managing investment portfolios (Jiang et al., Akhimien & Osawe, 2014). Artificial intelligence is increasingly becoming a transformative force in various fields, including library and information science.

For librarians, artificial intelligence presents both opportunities as it reshapes traditional library services and introduces new methods for managing and delivering information. Moreso, Artificial intelligence technologies are being integrated into libraries to enhance and automate various services, making them more efficient and user centric. Artificial intelligence is making so many impacts in various areas like; information retrieval and discovery, Artificial intelligence-powered search systems, and recommendation engines are improving the way users discover and access information.

Application of AI technology in libraries is possible through different modes. Different studies by Yu et al (2019), Ali et al (2020), Oname and Alex-Nmecha (2020) and Olayode (2022) identified several AI tools that can be adopted in libraries to include, robots, chatbots, expert self -reading system, book-reading bots, facial recognition, google-chat, google drive, drive one, big data, cloud computing, thumb google translator RFID. Hence AI can be applied in different varieties of library services. Specifically, Adetayo (2023) identifies Chatbots (ChatGPT) as valuable tool of artificial intelligence that can be applied in library service delivery. According to the author, this tool provides rapid and accurate responses to user's queries, offering convenience and accessibility outside the traditional library and hours.

Also, AI systems can analyze past search queries and interactions to suggest relevant resources or new titles (Smith & Watson in Akhimien & Osawe, 2014). Artificial intelligence can automate the cataloging process by generating metadata and classifying resources with high accuracy. Natural language processing techniques are used to extract and organize information from documents, reducing the manual effort required for cataloging (Baker et al., in Akhimien & Osawe, 2014). Artificial intelligence tools can also improve the consistency and quality of metadata across digital collections (Gorman, 2019). Artificial intelligence driven virtual assistants and chatbots are being used to provide real-time assistance to library users. These tools handle routine queries, guide users in navigating library resources, and provide information on library services (Fitzgerald & Rea, 2021). In addition, Artificial intelligence systems analyze user data to predict future behaviour and trends.

This allows librarians to proactively address user needs and preferences, such as identifying popular books or anticipating future research trends (Davenport & Ronanki, 2018). Predictive analytics may also assist in resource allocation and strategic planning (Jansen et al., 2020). These digital platforms enable users to access scholarly materials remotely, contributing to more efficient research and learning environments (Ezeani & Nwalo, 2017). Memela (2023) describes AI as the new hope for the librarians for provision of automated services to users as it is one of the technologies that has risen to play a major role in the upcoming 5th industrial revolution. According to a study conducted by Ogwo, Ibegbulem, and Nwachukwu (2023), artificial intelligence has the potential to increase productivity, improve customer satisfaction through personalized service, make information more easily available and accessible, and facilitate collaboration and knowledge sharing. In the same vein, Olayode (2022) reveals that AI technology has the potential of simplifying library functions, enhancing librarian's efficiency, and promoting quality service delivery. Oname and Alex-Nmecha (2020) in an earlier study, assert that error-free operations, working all round the clock without getting tired unlike humans, freeing the librarian to do more demanding jobs, speed, efficiency and effectiveness are the potentials of application of AI in libraries. From the foregoing, AI has the potential to improve service delivery, enhance decision-making, and provide innovative library services, which in turn provide value-added services, foster digital transformation, and enhance service provision.

Fundamentally, artificial intelligence can analyze texts, make knowledge models, and use machine learning to make decisions and produce knowledge. In specific terms, AI chatbots (ChatGPT) can be incorporated into the daily workflow of library work, providing practical tools for specific tasks. Also, Artificial intelligence capabilities include robotic process automation, computer vision, machine learning, natural language text understanding, virtual agents/conversational interfaces, physical robots, natural language speech understanding, natural language generation, and self-driving vehicles (Bughin et al, 2018). According to Balsubramanian and Tamilselvan (2023), the impact of AI on library operations and services manifests itself in the following way:

AI powered system can assist users to find relevant resources more quickly and easily, analyzing search behaviour of users, identifying search patterns and suggesting resources that may be of interest to users, as well as real-time query resolution and individualized, responsive customer care. Collection Management process AI can help in the selection and acquisition of library resources by analyzing usage data, identifying popular items, and predicting future demand, allowing the library to make more informed decisions about which resources to purchase while also allocating fund more efficiently. Processing and organizing library resources:

AI facilitates the cataloging and classification of library items, lowering the time and effort required to handle and arrange collections. Inclusive Information Accessibility: AI enables more inclusive access to resources and services, particularly for the challenged, by providing alternate text and audio description, automatic translations, and other assistive technology. Preservation of Resources: AI can digitize and preserve library items, lowering the risk of loss or damage to physical documents and making them more publicly available and usable in the future.

Awareness indicates the extent to which users have information and knowledge of AI. Amadi-Iwai, Ubulom and Okiridu (2024) define awareness as knowledge about something that exists or understanding of a situation or subject at the present time based on information or experience. This could be seen as a knowledge of a situation, fact, consciousness, recognition, realization, grasp and acknowledgement concern about and well-informed interest or familiarity in a particular situation or development based on this definition. The awareness level of AI among librarians has received varied outcomes. It has not only been in recent years that the conversations surrounding the impact of AI on libraries have emerged (Hervieux, & Wheatle, 2021). Abayomi et.al (2020) affirmed that most academic librarians are aware of the existence of AI usage in university libraries. In a related development, Berdasco et.al (2019) asserted that 99% of their respondents were aware of the various assistants but, only 86% had used them. Codex in Akhimien & Osawe, (2014) stated that at least 22% of librarians studied were aware of having used the technology at some point as part of their job duties. Even though they expressed varied perceptions regarding the concept.

AI adoption in academic librarians in Nigeria is driven by the need for more efficient information management, enhanced user experience, and support for research activities. While many Nigerian universities have made strides in digitizing their resources, AI offers advanced capabilities, such as automation, personalized recommendations, natural language processing (NLP), and predictive analytics, which can significantly enhance library operations and services (Adebayo, 2020). This implies that one of the motives of adopting AI technologies in university libraries is to satisfy user needs. The integration of Artificial Intelligence (AI) into academic libraries has seen significant growth over the past decade. This adoption is driven by the increasing need to improve library services, streamline operations, enhance user experience, and provide more efficient management of library resources. Over the past decade, academic libraries in Edo State have made significant strides in the integration of technology. Institutions like UNIBEN and AAU have increasingly digitized their collections, offering students and faculty access to electronic journals, e-books, and databases such as JSTOR, Science Direct, and the Nigerian Digital Library. These digital platforms enable users to access scholarly materials remotely, contributing to more efficient research and learning environments (Ezeani & Nwalo, 2017). The adoption of Library Management Systems (LMS), such as Koha and Alma, has also streamlined library operations in Edo State's academic libraries. These systems automate cataloging, circulation, and acquisition processes, reducing the need for manual record-keeping and improving the overall efficiency of library management.

University librarians are involved in evaluating information literacy learning, assessing research consultations, monitoring the use of digital resources, and measuring the impact of library services. As these responsibilities expand, AI tools offer new opportunities for automation, personalization, and data-driven decision-making. This paper explores how librarians have begun to adopt AI tools for assessments and the implications for universities. Library assessment encompasses evaluation of student learning outcomes, service quality, resource usage, and the library's contribution to institutional goals. Assessments help librarians improve instruction (e.g., information literacy), allocate resources effectively, and justify funding.

In a related development, Oyekale and Zubairu (2023) assessed the awareness perceptions, and adoption of AI in university libraries in Osun State, Nigeria. The study showed that 80% of the librarians were highly aware of AI but none of the libraries surveyed has adopted AI for library services. Equally, Abayomi, et. al.'s (2021) study indicates that librarians were aware of AI in the management of university libraries in Nigeria. Moreso, Ali, et. al. (2022) study on AI tools and university librarians revealed that librarians were aware of AI technologies. The level of preparation as revealed in the literature here was as a result of various conversations and ongoing conferences and workshops on the impact of AI on libraries (Hervieux, & Wheatle, 2021). However, Wood and Evans (2018) insisted that AI is not much discussed in library literature as compared to professions like medicine, law, military, and aviation, which is affecting its adoption and use by librarians and libraries. Notwithstanding the challenges, Obiano, et al. (2016) studied the facilitating conditions for the adoption of AI in Nigeria academic libraries. The study revealed that a total of 170 librarians who responded in the study were prepared to adopt AI in library services.

In Nigeria, Adebayo, et. al. (2022) takes a look at the adoption of AI for effective library services in academic libraries in Nigeria. The paper established some of the benefits of adopting AI in academic libraries which include user friendly, infinite functions, ability to take complex work among others. The paper concluded that the adoption of AI in academic libraries is setting a new level of efficiency and effectiveness in library service delivery that would help the financial uncertainty, emerging skill gap, and competing with today's

alternative sources of information that is prevailing among developing countries such as Nigeria. Despite the benefits of AI, some studies have demystified the challenges facing the adoption and use of AI by librarians for information services to patrons with visual and hearing impairments. Hussain (2023) stated that even though AI is a potential and vibrant technology that can be used in the university library for the acceleration of library services to people with disability several factors such as inadequate funding, the attitude of librarians and technical skills were a few obstacles that is hampering its adoption in library operations (Hussain, 2023). Similarly, a lack of trained sign language facilitators and the high cost of assistive devices such as AI were some of the major challenges facing the deployment of AI in libraries for the benefit of users with hearing and visual impairment (Kumar, et al., 2022).

Statement of the Problem

Artificial Intelligence has a lot of potentials including knowledge discovery which is often the standard of gauging the user experience (Cox, 2023). Academic librarians therefore need to explore how AI can be leveraged to provide personalized and efficient services to users, such as advanced search capabilities, recommendation systems for research materials, and virtual assistants to support information queries. These tools could also be used to enhance daily repetitive library tasks such as information management process, administrative duties and material security. However, despite its potential, the concept of artificial intelligence among Librarians remains a grey idea, especially in Nigeria. This puts the academic librarians in Nigeria at a risk of missing the opportunities to enhance library services, thus losing a competitive edge against other resource databases. While some traces of the technology such as chatbots have found their ways into the library management systems, the technology still possess more widespread and long-term solutions to library practices (Onyalo, 2022). With the idea still less explored, there is need for more research on artificial intelligence and its usefulness among Librarians. Filling such knowledge and application gaps requires a study that would delve into the potential of the technology in improving user experiences and library services among the academic librarians. If the situation continues as it is, libraries would continue with insufficient service delivery which includes missed opportunities in cost-saving, limited personalization of material recommendation which ultimately means inefficiency in information retrieval. Through adoption of AI academic librarians can harness their services, support research and learning, and remain relevant and valuable in the digital age.

Purpose of the Study

The main of the study is to assess Academic Librarians' Awareness Level and Adoption of Artificial Intelligence Tools for Teaching and Assessment in Universities. Specifically, it seeks to

- I. To determine academic librarians' level of awareness of AI tools relevant to teaching and assessment.
- II. To examine the extent of adoption of AI tools among librarians in instructional and evaluation activities.

Research Questions

1. What is the level of librarians' awareness of AI tools for teaching and assessment?
2. To what extent librarians adopt AI tools in their instructional activities.

II. Methodology

The study employed a descriptive survey research design. According to Maduakonam (2004), descriptive survey research seeks to collect detailed factual information that describes the nature of existing conditions. It assesses the characteristics of the whole population and usually study sample drawn from the population of the study. The population of the study consists of all the 70 academic Librarians in the federal Universities in South East of Nigeria. Based on the data collected from Nigeria University Commission (February, 2024), there are 6 (six) federal universities in Southeast, Nigeria; namely Alex Ekwueme federal university, Ikwo, Ebonyi State, Federal University technology, Owerri, Michael Okpara University of Agriculture, Umudike, Abia State, Nnamdi Azikiwe University, Awka (NAU) and University of Nigeria, Nsukka (UNN) and Alvan Ikoku Federal University of Education (AIFUE). The sample consists of 60 Academic librarians (20 male and 40 female) derived from five federal universities in Southeast, with each university producing 10 respondents that are all certified librarians. The instrument for data is structured questionnaire titled Librarians' Awareness and Adoption of Artificial Intelligence Tools for Teaching and Assessment in Universities (LAAAITTAU). The LAAAITTAU was measured on a 4-point Scale format of Strongly Agree, Agree, Disagree and Strongly Disagree, which were assigned numerical values, 4, 3, 2, and 1. The instrument was validated by two experts from the department of measurement and evaluation of Alvan Ikoku Federal University of Education, Owerri, and one expert from information and library science. They scrutinized the contents of the questionnaire, offered useful corrections and suggestions, which led to some modifications. Based on such corrections and modifications, the instrument was considered adequate and the final draft of the questionnaire was produced. The reliability of the instrument was established when it was

administered to 20 academics Librans selected from two schools, which are similar with the people used in the main study. The instrument has reliability of 0.88 Cronbach alpha. The questionnaires were sent through respondents' emails and were also returned through the same channel 100%. The data collected were analyzed using Mean and standard deviations.

III. Results

Research Question one: What is the level of librarians' awareness of AI tools for teaching and assessment

Table 1: Mean and standard deviation on level of librarians' awareness of AI tools for teaching and assessments.

S/N	Items	Mean	SD	Remarks
1	Turnitin (plagiarism detection)	3.00	1.0	High Level
2	Grammarly (writing assistance)	3.03	0.9	High Level
3	Coursera (online courses and resources)	3.00	1.0	High Level
4	Khan Academy	3.00	0.8	High Level
5	Moodle	3.00	1.0	High Level
6	AI chatbots	2.80	0.8	High Level
7	AI-driven analytics	3.12	0.6	High Level

Table 1 shows that items 1 to 7 have mean scores above the cut-off point of 2.50. This shows that librarians have high-level awareness of AI tools for teaching and assessment

Research Question Two: To what extent librarians adopt AI tools in their instructional activities.

Table 2: Mean and standard deviation on extent librarians adopt AI tools in their instructional activities.

S/N	Items	Mean	SD	Remarks
8	Are you familiar with artificial intelligence tools that can be used in instructional activities in libraries.	1.9		Low adoption
9	Do you currently use any AI tools in your instructional activities as a librarian	1.3		Low adoption
10	How do you believe the use of AI tools has impacted your instructional practices in the library	1.6		Low adoption
11	How often do you incorporate AI tools into your instructional activities	2.0		Low adoption
12	What benefits do you perceive in using AI tools for instructional activities in libraries	1.8		Low adoption
13	How often you received any training or support to help you effectively integrate AI tools into your instructional activities	2.1		Low adoption
	What barriers have you encountered in adopting AI tools instructional activities in library	1.9		Low adoption

Results in table 2 indicated that all the question items scored below 2.50. this implies that that librarian has adoption AI tools in their instructional activities.

IV. Discussion

Level of Librarians' Awareness of AI Tools for Teaching and Assessment

Results indicated that librarians' high-level awareness of AI tools for teaching and assessment. This result is in accord with the findings of Oyekale and Zubairu (2023) assessed the awareness perceptions, and adoption of AI in university libraries in Osun State, Nigeria. The study showed that 80% of the librarians were highly aware of AI but none of the libraries surveyed has adopted AI for library services. Equally, Abayomi, et. al.'s (2021) study indicates that librarians were aware of AI in the management of university libraries in Nigeria.

Extent Librarians Adopt AI Tools In Their Instructional Activities.

Result indicated that librarian has low adoption AI tools in their instructional activities. The findings support the postulates made by Bawden (2019), stating that libraries should take proactive steps toward assuming AI implementations to serve as assets and tools for delivering more efficiency to operational dynamics as well as better experiences to library users. There is harmony with study findings when Bawden asserts that libraries should not only be consumers but active participants in AI-related activity, it highlights why this study believes that every library professional must possess awareness of the ability of AI tools in the advancement of practice across positions. Also, Young-Ho (2022) asserted librarians agreed that AI application is inevitable, though its uptake has been constrained by the difficulties of its implementation.

V. Conclusion

This study revealed a high level of awareness of Artificial Intelligence (AI) tools among librarians at federal Universities in south East of Nigeria. Interestingly, despite this high awareness, the study also found the librarians has low adoption of AI. Librarians is to explore innovative teaching methods and assessment that

integrate AI and enhance student learning experiences. Additionally, targeted training programmes can address skill gaps related to applying AI tools within their disciplines. These steps can contribute to improved teaching, learning, and assessment student success.

VI. Recommendations

Based on the findings of the study the following are recommended:

1. To enhance AI awareness and digital literacy, the library, in collaboration with the ICT department and external AI experts should organize mandatory training programmes, combining online modules with interactive workshops and hands-on practice sessions.
2. Continuous monitoring and evaluation of AI effectiveness should be developed, using feedback from students, faculty, and stakeholders to refine and improve implementation strategies. AI

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