

ARTIFICIAL INTELLIGENCE LITERACY AND DIGITAL COMMUNICATION COMPETENCIES OF LIBRARIANS AS PREDICTORS OF SERVICE DELIVERY IN STATE UNIVERSITY LIBRARIES IN SOUTH-SOUTH, NIGERIA

By

OSAZE PATRICK IJIEKHUAMHEN

Ph.D Researcher, Library and Information Science Department,
Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State

and

PROF. BOMA B. OBI

Library and Information Science Department,
Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State,
Nigeria

Abstract

The study examined artificial intelligence literacy and digital communication competencies of librarians as predictors of service delivery in state university libraries in South-South Nigeria. A correlational research design was adopted for the study with a population of 164 librarians engaged in the state university libraries in South-South, Nigeria. A structured questionnaire designed by the researcher was the instrument adopted for eliciting data from the respondents. The reliability of the instrument yielded an alpha coefficient of 0.87, indicating the instrument is reliable. The data elicited using the questionnaire were analysed using descriptive statistics for the research questions, and the Pearson Product-Moment Correlational Coefficient was adopted for the Hypotheses at the 0.05 level of significance. The findings revealed that the librarians do not possess artificial intelligence literacy for effective library service delivery in the state university libraries examined. The findings indicate that the librarians moderately possess digital communication competencies to support library service delivery in the state university libraries. The finding indicated that a strong positive relationship exists between librarians' AI literacy and service delivery in the state university libraries. The findings indicated that a moderate positive relationship exists between librarians' digital communication competencies in 4IR technologies and service delivery. It was recommended that university library management in South-South Nigeria should regularly conduct AI training programmes to improve librarians' literacy and enhance the use of AI in service delivery, and state university library management should organise capacity building efforts to boost the digital communication competencies of their librarians.

Keywords: AI Literacy; Digital Communication Competencies; Librarians; Service Delivery; State University Libraries

Introduction

The purpose of the university library's service delivery is to meet the information demands of the users who make up the university community and to achieve the objective of encouraging research and study. Following the international standard, Igwela and Nsirim (2018) listed the following as library services: reference services, document delivery services, borrowing, renewing, and reserving; computerized interactive search; technical services, IT services, e-library services; serials services; exhibition and displays; user education; Selective Dissemination of Information (SDI); Current Awareness Services (CAS) and referral services, among others.

In this digital age, providing services in university libraries necessitates a range of strategies and tactics that are always evolving, especially as digital technology becomes more integrated (Lu & Lin, 2025; Mirza & Jabeen, 2025). Librarians are expected to leverage new technologies in service delivery, particularly in university libraries. Librarians can leverage AI tools such as Chatbots, ChatGPT, Perplexity AI, Turnitin, Robots, and Humanoids for enhancing their service delivery needs. To communicate effectively in this digital age, platforms such as social media, instant messenger, Short Message Service, Email and other video conferencing tools like ZOOM meetings can be adopted by librarians. Librarians must possess the competencies that are needed in order to fully implement these cutting-edge technologies to enhance their service delivery needs.

Scholars assert that librarians need to possess AI literacy and digital communication competencies to render effective services in this digital age (Chatikobo & Pasipamire, 2024; Lo, 2024). Artificial intelligence (AI) literacy is the

set of competencies that enables individuals to critically evaluate AI technologies, communicate and collaborate effectively with AI, and proficiently use AI as a tool across various contexts such as online environments, workplaces, and everyday life (Chiu et al., 2024). Librarians' AI literacy is an expansive and vital competency that encompasses not only an understanding of how AI technologies work but also the skills to critically assess and ethically engage with these technologies (Lo, 2024). On the other hand, digital communication competencies can be defined as librarians' ability to communicate using digital tools like social media, short message service, electronic mail, social media, and other teleconferencing communication devices/apps.

The present study is aimed at exploring artificial intelligence literacy and digital communication competencies of librarians as predictors of service delivery in state university libraries in South-South Nigeria.

Statement of the Problem

University libraries are established to render services and make available current information resources to members of their academic community. In advanced nations of the world, librarians are now engaging novel technologies for improving their service delivery needs and communication requirements. Users in this digital age expect their libraries to be innovative in their service delivery model via the incorporation of cutting-edge technologies, which would enable them to access services at their convenience in their hostels, offices, classrooms, homes, or anywhere around the globe.

The poor incorporation of technologies could be attributed to librarians' incompetence in the use of these technologies for service delivery. This was ascertained by interacting with some librarians in state-owned university libraries

within the study scope. Competencies such as AI literacy and digital communication competencies are considered the linchpin for the successful deployment of technologies within the university library settings. The researcher observed from a preliminary literature search using databases and Google search that the state's university libraries may be grossly understudied in terms of artificial intelligence literacy and digital communication competencies of librarians as predictors of service delivery in state university libraries in South-South Nigeria. The present study is undertaken to fill the lacuna in knowledge.

Research Questions

The study provided answers to the following research questions:

1. What is the Artificial Intelligence Literacy of the librarians in the state university libraries in South-South, Nigeria?
2. What are the digital communication competencies of the librarians in the state university libraries in South-South, Nigeria?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

1. There is no significant relationship between librarians' artificial Intelligence literacy and service delivery in the state university libraries in South-South, Nigeria.
2. There is no significant relationship between digital communication competencies and service delivery in the state university libraries in South-South, Nigeria.

Literature Review

The university library's service delivery is undertaken to fulfil the information needs of users who comprise the university community, to accomplish the goal of

fostering study and research (Owolabi et al., 2025). Tshabalala and Dube (2024) affirmed that service delivery within libraries is a multifaceted concept that encompasses various strategies and technologies aimed at enhancing user experience and meeting information needs. In this digital age, providing services in university libraries necessitates a range of strategies and tactics that are always evolving, especially as digital technology becomes more integrated (Lu & Lin, 2025). Scholars have argued that librarians need to possess AI literacy and digital communication competencies to be able to render effective services in this digital age (Lo, 2024; Kayode & Oguntayo, 2024). In a study, Chee et al (2024) characterised AI literacy as the ability to understand, use, monitor, and critically reflect on AI applications, including recognising their capabilities and limitations and navigating their ethical implications. Chee et al further affirmed that librarians need to possess the required AI literacy to be able to render services using AI tools in their libraries. On the other hand, Topsümer et al. (2023) defined librarians' digital communication competencies as a comprehensive range of skills that empower them to interact effectively with users and colleagues in an increasingly digital environment.

Davis's 1989 technology acceptance model serves as the foundation for the study. Davis drew insights from the Theory of Reasoned Action (TRA) of Ajzen and Fishbein and describes the elements that affect people's choices to accept technology, highlighting perceived usefulness and ease of use as important aspects (Burgess & Worthington, 2021). Davis (1989) made the case that perceived usefulness and ease of use are the two main criteria that influence the adoption of new technology. Perceived usefulness is the first variable in the TAM model. According to Davis (1989), perceived usefulness is the degree to which an individual believes that using a particular technology will be beneficial. The likelihood that people will employ a

given technology increases with their perception of its usefulness. Perceived ease of use is the second TAM variable. According to Davis (1989), perceived ease of use is the extent to which an individual believes that using a particular technology would be simple. As a person's opinion of a technology's usability increases, so do their intentions to utilise it. The perceived ease of use variable relates to the independent variables of the study associated with librarians' AI literacy and digital communication competencies, hence its adoption for the study.

Using a case study, Lo et al. (2024) explored artificial intelligence literacy in academic libraries using the United States librarians. The study adopted a survey research method. The findings revealed that the majority of the respondents possessed a moderate AI literacy level for the use of these tools for service delivery. Alam et al. (2024) explored artificial intelligence literacy and Zambian university librarians, assessing their perception and application. The study adopted a quantitative survey research approach. The findings revealed that the librarians are well-versed in the use of AI platforms, and they have a proper understanding of the application of artificial intelligence for meeting their various service delivery needs. Hervieux and Wheatley (2021) assessed the perceptions of artificial intelligence among academic librarians in Canada and the United States. The study adopted a survey research method. The findings revealed that the librarians lacked the necessary artificial intelligence literacy for applying the tools for service delivery in their libraries.

Hussain and Richardson (2024) examined the awareness of Pakistani academic librarians toward digital communication skills, assessing the barriers and benefits. The study adopted a quantitative research method using a web-based survey as its strategy. Overall, the findings revealed a moderate to high level of knowledge by the librarians of basic library communication skills and their associated benefits.

Ezeani (2011) investigated the network literacy skills of academic librarians for efficient service delivery in the University of Nigeria, Nsukka library system. The study adopted a survey research design. The findings revealed that the majority of the librarians could not use digital communication tools like emails and social networking sites for resource sharing and scholarly communication. Daniels et al (2023) examined librarians' ICT skills and effective library service delivery in university libraries in Rivers State. The research design used in the study was correlational. The findings revealed that the librarians lacked digital communication skills, though a correlation exists between effective library services and the digital communication skills of the librarians.

Adekanye (2024) examined artificial intelligence utilisation and its effect on library service delivery quality in the University of Lagos Library. The study adopted a survey research method. The findings revealed that the frequency of the utilisation of artificial intelligence did not affect service delivery quality in the University of Lagos Library. Obiozor-Ekeze (2023) examined the relationship that exists between librarians' social media skills and service delivery in public universities in Anambra State, Nigeria. The finding revealed that a positive and strong correlation exists between the social media skills of the librarians and the quality of their service delivery in the public university libraries in Anambra State, Nigeria.

Research Methodology

The study adopted a correlational research design. The population comprise 164 librarians engaged in the state university libraries in South-South, Nigeria. The census sampling technique was adopted for the study as a result of the manageable population size. The instrument used for eliciting data from the respondents is a self-designed questionnaire by the researcher in a four-point Likert scale format. The

instrument reliability was ascertained using a pilot test. The researcher distributed 30 copies of the instrument to 30 librarians in the University of Nigeria, Nsukka library, which is outside the scope of the study. Cronbach's Alpha was used to assess the instrument's reliability, and it yielded an Alpha Coefficient of 0.87, which indicated that the instrument was reliable and could measure what it was intended to measure. The data elicited were analysed using descriptive statistics for the research questions and the Pearson Product-Moment Correlation Coefficients for the hypotheses at the 0.05 level of significance.

Decision Rule

On the descriptive statistics, mean values above the criterion mean of 2.50 are tagged as agreed, while does below the criterion mean are tagged as disagreed.

The study adopted the decision rule set by Evans (1996), which interprets the strength of relationships using the Pearson Product-Moment Correlation Coefficient (r) as follows:

0.00 – 0.19	→	Very Weak Relationship
0.20 – 0.39	→	Weak Relationship
0.40 – 0.59	→	Moderate Relationship
0.60 – 0.79	→	Strong Relationship
0.80 – 1.00	→	Very Strong Relationship

Research Findings

This section of the study addressed the questionnaire response rate, results and discussion of the research findings based on the research questions and hypotheses.

Questionnaire Response Rate

Table 1: Questionnaire Response Rate

No of Questionnaires Distributed	No of Questionnaires Retrieved	Percentage of Return
164	152	93%

From Table 1, 164 copies of the questionnaire were distributed to the respondents, and the researcher was able to retrieve 152 copies, resulting in a 93% return rate, which was considered adequate for the study.

Research Question 1: What is the Artificial Intelligence Literacy of the librarians in the state university libraries in South-South, Nigeria?

Table 2: Summary of Mean Rating on the Artificial Intelligence Literacy of Librarians in State University Libraries

Artificial Intelligence Literacy of Librarians	SA	A	D	SD	$\bar{x}$	Decision
I can practically apply AI for library service delivery.	26	47	55	24	2.49	Disagree
I understand that the results of AI need to be cross-checked when applied to library service delivery.	53	23	32	44	2.56	Agree
I have received training on the application of AI for library service delivery.	22	17	66	47	2.09	Disagree
I am confident in using AI-driven tools for improving library service delivery.	28	27	72	25	2.38	Disagree
I can identify appropriate AI tools that support various library services.	18	32	63	39	2.19	Disagree
I can install chatbots for library reference service delivery.	12	19	83	38	2.03	Disagree

Criterion Mean = 2.50 Aggregate Mean = 2.29

Table 2 revealed that the aggregate mean is 2.29, which is below the criterion mean of 2.50, indicating that respondents generally do not possess artificial intelligence literacy for effective library service delivery in the state university libraries in South-South, Nigeria.

Research Question 2: What are the digital communication competencies of the librarians in the state university libraries in South-South, Nigeria?

Table 3: Summary of Mean Rating on the Digital Communication Competencies of Librarians in State University Libraries

Digital Communication Competencies of Librarians	SA	A	D	SD	$\bar{x}$	Decision
I can communicate using various digital	72	33	28	19	3.04	Agree

communication channels (Emails, SMS, Instant Messaging Platforms, etc.).						
I can engage with library users using social media platforms.	64	35	32	21	2.93	Agree
I can make audio and video calls to enhance library service delivery.	53	23	31	45	2.55	Agree
I can attend meetings on ZOOM, Google Meet, Microsoft Teams, and other video conferencing platforms to enhance virtual library service delivery.	21	27	77	27	2.28	Disagree
I can develop and share digital content for library service delivery.	44	37	52	19	2.70	Agree
I can train library users on digital communication tools for accessing services.	21	18	79	34	2.17	Disagree
I am confident in adapting to new digital communication technologies for library service improvement.	34	23	65	30	2.40	Disagree
Criterion Mean = 2.50 Aggregate Mean = 2.58						

From Table 3, the aggregate mean of 2.58, which is higher than the criterion mean of 2.50, indicated that respondents generally agreed that they moderately possess digital communication competencies in 4IR technologies to support library service delivery in the state university libraries in South-South, Nigeria.

Testing of the Research Hypotheses

Hypothesis 1: There is no significant relationship between librarians' artificial Intelligence literacy and service delivery in the state university libraries in South-South, Nigeria.

Table 4: Summary of Pearson Product-Moment Correlation between Librarians' Artificial Intelligence Literacy and Service Delivery

SN	Variables		AI literacy	Service delivery
1	AI literacy	Pearson Correlation	1	.636**
		Sig. (2-tailed)		.002
		N	152	152
2	Service delivery	Pearson Correlation	.636**	1
		Sig. (2-tailed)	.002	
		N	152	152

***. Correlation is significant at the 0.05 level (2-tailed).**

Table 4 showed the Correlation between librarians' artificial intelligence literacy and service delivery in state university libraries in South-South, Nigeria. The

Pearson correlation coefficient (r) is 0.636, indicating that a strong positive relationship exists between librarians' AI literacy and service delivery, based on the decision rule scale. This implies that librarians who possess higher levels of AI literacy tend to deliver better library services. The p -value is 0.002, which is less than the 0.05 significance level, indicating that the relationship between librarians' AI literacy and service delivery is statistically significant. Since the relationship is statistically significant, the null hypothesis is rejected. Therefore, there is a significant relationship between librarians' AI literacy and service delivery in state university libraries in South-South, Nigeria.

Hypothesis 2: There is no significant relationship between digital communication competencies and service delivery in the state university libraries in South-South, Nigeria.

Table 5: Summary of Pearson Product-Moment Correlation between Librarians' Digital Communication Competencies and Service Delivery

SN	Variables		Digital communication competencies in 4IR	Service delivery
1	Digital communication competencies in 4IR	Pearson Correlation	1	.526**
		Sig. (2-tailed)		.004
		N	152	152
2	Service delivery	Pearson Correlation	.526**	1
		Sig. (2-tailed)	.004	
		N	152	152

***. Correlation is significant at the 0.05 level (2-tailed).**

Table 5 indicates the correlation between librarians' digital communication competencies in 4IR technologies and service delivery in state university libraries in South-South, Nigeria. The Pearson correlation coefficient ($r = 0.526$) indicated that a moderate positive relationship exists between librarians' digital communication competencies in 4IR technologies and service delivery. This means that librarians

who are more proficient in digital communication technologies tend to provide more effective library services. The p-value is 0.004, which is less than the 0.05 significance level, indicating that the relationship between librarians' digital communication competencies in 4IR technologies and service delivery is statistically significant. Since the relationship is statistically significant, the null hypothesis is rejected. Therefore, it can be concluded that there is a significant relationship between librarians' digital communication competencies in 4IR technologies and service delivery in state university libraries in South-South, Nigeria.

Discussion of Findings

The findings were discussed in line with the objectives raised in the study. The findings revealed that the librarians do not possess artificial intelligence literacy for effective library service delivery in the state university libraries in South-South, Nigeria. This finding disagreed with the study of Lo et al. (2024), which indicates that the majority of the respondents possessed a moderate AI literacy level for the use of these tools for service delivery in the United States. The findings also do not align with the study of Alam et al. (2024), which revealed that the librarians are well-versed in the use of AI platforms, and they have a proper understanding of the application of artificial intelligence for meeting their various service delivery needs in the Zambian university libraries. The study findings agree with the research by Hervieux and Wheatley (2021), which indicates that librarians lacked the necessary artificial intelligence literacy for applying the tools for service delivery in their libraries in Canada and the United States.

The findings indicated that the librarians moderately possess digital communication competencies to support library service delivery in the state university libraries in South-South, Nigeria. These findings align with the study of Hussain and

Richardson (2024), indicating moderate to high levels of knowledge by the librarians of basic library communication skills and their associated benefits in the Pakistani academic libraries. Conversely, the findings did not agree with the study by Daniels et al (2023), which revealed that the librarians lacked digital communication skills in Rivers State, Nigeria, though a correlation exists between effective library services and the digital communication skills of the librarians.

The finding indicated that a strong positive relationship exists between librarians' AI literacy and service delivery in the state university libraries in South-South, Nigeria, based on the decision rule. The p-value is 0.002, which is less than the 0.05 significance level, indicating that the relationship between librarians' AI literacy and service delivery is statistically significant. Therefore, there is a significant relationship between librarians' AI literacy and service delivery in state university libraries in South-South, Nigeria. Hence, the null hypothesis stating there is no significant relationship is hereby rejected. This finding did not agree with the research by Adekanye (2024), which revealed that the frequency of the utilisation of artificial intelligence had no effect on service delivery quality in the University of Lagos Library.

The findings revealed that a moderate positive relationship exists between librarians' digital communication competencies and service delivery in the state university libraries in South-South, Nigeria. The p-value is 0.004, which is less than the 0.05 significance level, indicating that the relationship between librarians' digital communication competencies in 4IR technologies and service delivery is statistically significant. Therefore, it can be concluded that there is a significant relationship between librarians' digital communication competencies in 4IR technologies and service delivery in state university libraries in South-South, Nigeria. Hence, the null

hypothesis indicating no significant relationship is hereby rejected. This finding aligns with the study of Obiozor-Ekeze (2023), which stressed that a positive and strong correlation exists between the social media skills of the librarians and the quality of their service delivery in the public university libraries in Anambra State, Nigeria.

This finding of this study implies that the management of state university libraries in South-South, Nigeria, should put efforts towards training and development programmes channelled towards boosting the AI literacy and digital communication competencies of their librarians in view of improving their service delivery requirements.

Recommendations

In line with the findings of the study, the following recommendations are put forward to enhance librarians' competencies and service delivery in the state university libraries within the study scope:

1. It was recommended that the state university library management in South-South Nigeria should regularly conduct AI training programmes to improve librarians' literacy and enhance the use of AI in service delivery.
2. University library management in the state university libraries should acquire the necessary AI tools to enable librarians to have hands-on experience in the use of these tools for service delivery.
3. To boost digital communications necessary for effective service delivery, state university libraries should organise capacity building efforts like in-house training, attending workshops and conferences to boost the digital communication competencies of their librarians.
4. The necessary infrastructural facilities required to use AI and digital communication tools, such as internet access, power supply, and digital

gadgets, among others be made available to mitigate the barriers faced by librarians in the state university libraries.

Conclusion

The study assessed artificial intelligence literacy and digital communication competencies of librarians as predictors of service delivery in state university libraries in South-South Nigeria. The study was guided by two research objectives, research questions, as well as two hypotheses. It can be concluded from the study that the librarians do not possess the artificial intelligence literacy necessary for effective library service delivery in the state university libraries in South-South, Nigeria. It can also be concluded from the study findings that the librarians moderately possess digital communication competencies to support library service delivery. It was unveiled that a strong positive relationship exists between librarians' AI literacy and service delivery in the state university libraries in South-South, Nigeria. It was also discovered that a moderate positive relationship exists between librarians' digital communication competencies and service delivery in the state university libraries in South-South, Nigeria.

The findings from the study are a wake-up call for the state university library management; the results indicated that the librarians lacked AI literacy for enhancing their service delivery needs, whereas there is a strong, significant relationship between AI literacy of librarians and service delivery. This warrants the need for more training and development programmes channelled towards the AI literacy of librarians, since it would reflect in their service delivery. Similarly, the finding indicating librarians are moderately versed in digital communication competencies as well as the existence of a moderately significant relationship between digital communication competencies and service delivery, warrants the need for capacity building efforts to

enhance the digital communication competencies in the state university libraries in South-South, Nigeria.

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