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Assessment of Digital Skills Required and Possessed by Librarians for enhanced Service Delivery in University Libraries in North-Central Nigeria

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Abstract
University libraries are changing significantly in the digital age as technology continues to influence the production, accessibility, and distribution of knowledge. In order to identify competency gaps and provide capacity-building solutions, this study examines the digital skills that librarians already possess as well as those that are needed for optimal service delivery. Key digital skills such as information retrieval, database administration, online reference services, electronic resource management, social media involvement, and digital literacy training are analysed using a descriptive methodology. The population comprised 15 public university libraries and 234 librarians. total enumeration of used as sample size. The findings of the study identified essential digital skills for librarians and found that these skills are highly possessed, with no significant gender differences.

Keywords: Digital literacy librarians, library service delivery, librarian competencies, ICT skills university libraries, skills gap assessment North-Central

Introduction

University libraries continue to be essential components of academic settings because they facilitate research, teaching, and learning. University libraries are the "heart" and "life wire" of the university, because it provides a place for students and faculty to do their research and advance the frontier of their knowledge (Matthew, Kazaure & Okafor, 2021). It functions to fulfil both the needs of the instructional programmes of the parent institution and the academic community through the collection and acquisition of knowledge in all formats, to organise

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knowledge for easy storage and retrieval. But the environment of library services has undergone a significant transformation due to the digital revolution.

Librarians must learn sophisticated digital skills in order to meet the growing demand for institutional repositories, electronic journals, online resources, and digital reference services. Digital skills are the capacity to comprehend and use information in a variety of formats from a wide range of sources via computers (Bawden, 2001). Today, librarians' ability to successfully use ICT resources into their work is a major factor in how well libraries deliver services. This study therefore examines the digital skills currently possessed by librarians and those required for effective service delivery.

Statement of the Problem

The rapid integration of digital technologies into university library operations has transformed service delivery, requiring librarians to possess a range of digital skills for tasks such as managing electronic resources, providing virtual reference services, digitization, metadata creation, and supporting users in digital environments. While existing studies indicate that librarians in various Nigerian regions often demonstrate proficiency in basic digital competencies (e.g., internet use, basic computer operations, and information retrieval), gaps frequently emerge in advanced skills such as web development, data management, digital content curation, and emerging technologies.

Literature on digital competencies of librarians in Nigeria highlights inconsistencies between possessed skills and those demanded by evolving library mandates. Studies in South-South, Northern, South-East, and other regions report moderate to low proficiency in specialised areas, alongside persistent challenges like inadequate training opportunities, infrastructural limitations, and uneven skill distribution. However, there remains limited empirical focus on university libraries in North-Central Nigeria, where contextual factors such as institutional resources, regional infrastructure, and user demands may present unique dynamics. Few studies have systematically compared the specific digital skills librarians in this region currently possess against those required for optimal service delivery.

This assessment is necessary to provide a clear, evidence-based understanding of the alignment (or misalignment) between current competencies and professional requirements in North-Central Nigerian university libraries. Without such targeted investigation, opportunities to strengthen librarian capacity, inform targeted training programs, and enhance digital service delivery may remain unaddressed, limiting the libraries' ability to fully support teaching, learning, and research in a digital era. This study therefore seeks to bridge this gap by assessing the digital skills required and possessed by librarians in the region.

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Objectives

1. identify the relevant digital skills needed by librarians for effective service delivery in university libraries in North-Central, Nigeria
2. find out the digital skills possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria

Research Questions

In line with the purpose of the study, the study sought to answers the following questions:

1. What are the relevant digital skills needed by librarians for effective service delivery in university libraries in North-Central, Nigeria?
2. What are the digital skills possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria?

Hypotheses

The null hypothesis was formulated to guide the study and was tested at 0.05 level of significance.

Ho_1: There is no significant difference in the mean responses of male and female librarians in the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria.

Literature Review

University Libraries

University libraries are clear that not just mere reading rooms attached to and owned by institutions; rather, they are indeed the world's custodian of actual knowledge. University libraries play an indispensable role in the performance of these functions. But this role will be impossible unless library acquire necessary skills rendering effective service delivery (Tshabalala, & Dube, 2024). From the above, it shows that the concept of university libraries varies from person to person and from place to place in time. The conception tends to portray the societal values of different generation and social changes such as the development of human knowledge that has influence the concept of university libraries. As the scope of the university libraries broadens so also the wider range of functions, so also do the views people have of the library that is attached to it changes.

The advent of ICTs has ushered in new dimensions and challenges in library and information services provision in university libraries. Today, many of the major information services that are provided manually are now available and accessible on the internet (Soleimani, Elango & Hassanzadeh, 2024). Interestingly, library users can now search different databases, both online and offline on CDs as well as library catalogues of other academic libraries all over the globe. Olubiyo (2022) identified the following as major information services to be provided by university libraries in their quest to satisfy the information needs of their diverse user groups. These information services are summarised as lending services, reservation

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services, reference services, and selective dissemination of information and so on. Also, Sahabi and Otobo (2021) suggest that for the university library to meet the research needs of its users in various disciplines, the library must promote these essential services, inter library loan services, user education services and creation of special collections.

The university library is an integral and indispensable part of any university establishment to support the teaching, learning and research needs of universities they serve. However, no university establishment can be able to achieve its academic excellence without a functional library to back up its teaching, learning and scholarship activities (Udochukwu, 2019). It is their responsibility to ensure that the use of its information, resources, and services is maximized within a short possible time to benefit its patrons (Awotola & Olowolagba, 2018). University libraries are therefore, places where students/researchers can seek for their sense of intellectual integrity and the self-understanding, which is the ultimate goal of education

Digital Skills

The knowledge, skills, and competences that librarians and library patrons require to use digital tools, technologies, and resources for information access, management, and service delivery are referred to as digital skills in the context of libraries. The concept of digital skills, as described by Gupta (2022) encompasses the capability to effectively use digital information systems, including computer hardware and software, while implementing appropriate security measures to safeguard digital information. Those who are digitally literate possess a broad spectrum of digital skills, including a grasp of fundamental computing principles, proficiency in navigating computer networks, the ability to engage responsibly in online communities and adhere to behavioural norms, adeptness in searching for, capturing, and evaluating digital information, as well as an understanding of the societal implications of digital technologies and the possession of critical thinking skills

These skills empower librarians to effectively manage library technology infrastructure and online resources, allowing them to make informed decisions related to technology adoption (Izuagbe et al., 2019). Digital skills include the creation of metadata/tags, proficiency in software like Photoshop, the installation and management of library software, the establishment of institutional repositories, ICT skills, information retrieval skills, resource management skills, library consortium management, library networking, barcode and radio-frequency identification (RFID) technology, and website design. Building upon digital literacy, the concept of digital creativity involves the expression of creative skills in digital media, which can encompass programming, website development, and the generation and manipulation of digital images (Emiri, 2015). Librarians must possess these digital skills to advance in their careers, perform resource sharing, engage in social networking, explore the internet, employ instant messaging, engage in blogging, and participate in various other digital activities.

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The capacity to utilise digital tools and function within computerised environments is vital in every library most especially in university libraries where there is need for constant research. In situations where libraries lack sufficient skilled personnel, some institutions that have automated their libraries and acquired digital resources struggle to effectively manage these assets. These digital skills benefit professionals across various disciplines, enabling them to carry out their day-to-day tasks. According to Okeji, Tralagba and Obi (2020) digital skills encompass the ability to use digital technology, communication tools, or networks to locate, evaluate, use, and create information. It encompasses the understanding and effective use of information in multiple formats from a diverse range of sources, especially when presented through computers. All these skills are utilized by the library staff for effective service delivery.

Effective Service Delivery

Effective service delivery in university libraries is achieved when librarians successfully meet or exceed users' needs, expectations, and desired outcomes through the application of relevant competencies. In the digital era, this effectiveness is strongly linked to the digital skills possessed by librarians, as these skills enable the development, deployment, and management of digital information resources and services (Mbago, Mungwabi & Kimaryo, 2026).

Several empirical studies have established a direct connection between librarians' digital competencies and the quality of library services. For instance, research in North-West Nigeria found that digital literacy skills (including photo-visual, branching, and socio-emotional literacies) exert a positive and significant influence on innovative service delivery in university libraries (Okoro & Shittu, 2025). Similarly, studies in Taraba State and other parts of Nigeria have examined the correlation between librarians' digital literacy skills and overall service delivery, highlighting that proficiency in digital tools directly supports enhanced user access, resource discovery, and virtual services (Chukwueke & Idris, 2023).

In practice, effective digital service delivery encompasses offering timely access to electronic resources, personalised virtual reference assistance, user-friendly digital interfaces, efficient metadata management, digitisation, and responsive online support. Librarians with strong digital competencies can efficiently search and retrieve information using online databases, advanced search techniques, and digital tools, thereby providing accurate and timely information to users (Emezie & Nwaohiri, 2013; Oyedokun, Oyewumi, Akanbi & Laaro, 2018). Beyond access, they serve as trainers and facilitators, equipping library users with digital skills for academic, professional, and personal development. This positions university libraries as vibrant community centres that go beyond mere technology provision to deliver thorough, user-centric training and support.

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The primary expertise demanded of librarians now includes adept use of diverse digital tools for information retrieval, content curation, and service innovation. Acquisition of these skills often occurs through in-service training, workshops, seminars, sponsorship, peer learning, and self-development (Onakoya et al., 2023; Gupta, 2022). However, where gaps exist in advanced digital competencies, service quality is adversely affected.

Thus, effective service delivery in contemporary university libraries is not merely about providing resources but depends significantly on librarians' ability to harness digital technologies to create value, enhance user experiences, and support teaching, learning, and research objectives. This linkage underscores the need for targeted assessment of digital skills in specific contexts, such as North-Central Nigeria.

Methods

The study adopted a descriptive survey research design. The population comprised 234 librarians from 15 university libraries in North-Central Nigeria. Since the entire population was manageable, a census survey method was employed, and all 234 librarians were included in the study. The main instrument for data collection was a structured questionnaire. To ensure the instrument could effectively elicit the required information, it was subjected to face validation by three experts. Two of the experts were lecturers from the Department of Library and Information Science, University of Nigeria, Nsukka, while the third expert was from the Measurement and Evaluation Unit, Department of Science Education, Faculty of Education, in the same university. The experts reviewed the questionnaire and interview guide for alignment with the research questions and objectives. They also examined the appropriateness of language, clarity of expression, grammatical accuracy, and overall relevance. All corrections and suggestions from the experts were incorporated to produce the final version of the instruments used for data collection.

The reliability of the instrument was determined through a pilot test administered to 30 librarians from Federal University Wukari, Ahmadu Bello University Zaria, and University of Nigeria, Nsukka. These institutions were selected because they were not part of the main study population but shared similar characteristics with it. Cronbach Alpha was used to test the internal consistency of the instrument. The pilot test yielded cluster reliability coefficients of 0.84 for Cluster A and 0.79 for Cluster B, with an overall alpha coefficient of 0.82. These values were considered appropriate and acceptable for the study. In the main study, 234 copies of the questionnaire were administered with the assistance of 15 research assistants. Data collected were analysed using descriptive statistics (mean and standard deviation) with the aid of the Statistical Package for Social Sciences (SPSS) version 25 to answer the research questions.

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Results

Table 1: Mean response of relevant digital skills needed by librarians for effective service delivery in university libraries in North-Central, Nigeria, N=234.

S/N	Item Statement	HN	MN	LN	NN	$\bar{x}$	SD	R	Dec.
1	The ability to navigate and use library management software	191	38	1	4	3.78	0.53	1st	HN
2	Familiarity with electronic databases and search techniques	146	68	16	4	3.52	0.70	4th	HN
3	Proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians.	145	66	21	2	3.51	0.70	5th	HN
4	Knowledge of copyright and intellectual property laws	126	75	24	9	3.36	0.82	11th	MN
5	Effective communication skills in assisting users with digital research queries	152	58	16	8	3.51	0.77	5th	HN
6	Being up-to-date with emerging digital technologies in the library field is essential for librarians.	146	71	12	5	3.53	0.69	2nd	HN
7	Adaptability to changing technological trends	133	68	26	7	3.40	0.80	9th	MN
8	The ability to provide online instruction and virtual reference services	143	66	15	10	3.46	0.80	7th	MN
9	Skills in evaluating the credibility and reliability of online information sources	142	77	13	2	3.53	0.64	2nd	HN
10	Knowledge of data management and analysis tools	130	74	23	7	3.40	0.79	9th	MN
11	Proficiency in using social media and online marketing for library promotion	127	91	12	4	3.46	0.68	7th	MN
12	The ability to collaborate with other library staff on digital initiatives.	113	84	23	14	3.26	0.87	12th	MN
	Cluster Mean					**3.48**	**0.42**		**MN**

Key: $\bar{x}$ = mean, SD = Standard Deviation, HN = Highly Needed, MN = Moderately Needed, **R** = Rank, Dec. = Decision.

Table 1 displays the mean responses of relevant digital skills needed by librarians for effective service delivery in university libraries in North-Central, Nigeria. From the table, items 1, 3, 5, 6, and 9 have mean value ranging from 3.78-3.51, which fall within the range of the relevant digital skills highly needed by librarians for effective service delivery. In contrast, items 4, 7,

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8, 10, 11, and 12 have mean values ranging from 3.46-3.26, which fall within the range of the relevant digital skills moderately needed by librarians for effective service delivery. The standard deviation of items 1-12 ranges from 0.53-0.87, indicating that respondents were generally consistent in their opinions regarding the digital skills needed for effective service delivery. From the result, the ability to navigate and use library management software ($\bar{x}$ = 3.78, SD = 0.53) is ranked first, being up-to-date with emerging digital technologies in the library field ($\bar{x}$ = 3.53, SD = 0.69) is ranked second, and skills in evaluating the credibility and reliability of online information sources ($\bar{x}$ =3.53, SD = 0.64) is ranked third among others. While the ability to collaborate with other library staff on digital initiatives ($\bar{x}$ = 3.26, SD =0.87) is ranked last.

The findings from the quantitative data in Table 1 above indicate that the ability to navigate and use library management software skills in evaluating the credibility and reliability of online information sources, familiarity with electronic databases and search techniques, and proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians among others are the relevant digital skills highly needed by librarians for effective service delivery in university libraries in North-Central, Nigeria.

Table 2: Mean response of digital skills possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria, N=234.

S/N	Item Statement	HP	MP	LP	NP	$\bar{x}$	SD	R	Dec.
1	The ability to navigate and use library management software	149	73	9	3	3.57	0.63	2nd	HP
2	Familiarity with electronic databases and search techniques	114	95	17	8	3.35	0.76	3rd	MP
3	Proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians.	115	85	31	3	3.33	0.75	5th	MP
4	Knowledge of copyright and intellectual property laws	105	81	37	11	3.20	0.87	10th	MP
5	Effective communication skills in assisting users with digital research queries	120	84	21	9	3.35	0.80	3rd	MP
6	Being up-to-date with emerging digital technologies in the library field	163	58	9	4	3.62	0.65	1st	HP
7	Adaptability to changing technological trends	107	96	26	5	3.30	0.75	7th	MP
8	The ability to provide online instruction and virtual reference services	112	91	25	6	3.32	0.77	6th	MP

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9	Skills in evaluating the credibility and reliability of online information sources	102	96	30	6	3.26	0.78	8th	MP
10	Knowledge of data management and analysis tools	112	82	27	13	3.25	0.87	9th	MP
11	Proficiency in using social media and online marketing for library promotion	106	83	28	17	3.19	0.91	11th	MP
12	The ability to collaborate with other library staff on digital initiatives.	109	76	28	21	3.17	0.96	12th	MP
	Cluster Mean					**3.33**	**0.47**		**MP**

Key: $\bar{x}$ = mean, SD = Standard Deviation, HP = Highly Possessed, MP = Moderately Possessed, **R** = Rank, Dec. = Decision.

Table 2 displays the mean responses of digital skills possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria. From the table, items 1 and 6 have mean values of 3.57 and 3.62, which fall within the range of digital skills highly possessed by librarians for effective service delivery. In contrast, items 2-5 and 7-12 have mean values ranging from 3.35 - 3.17, which fall within the range of digital skills moderately possessed by librarians for effective service delivery. The standard deviation of items 1-12 ranges from 0.63-0.96 shows that the respondents were close to one another in their opinion regarding the digital skills they possess for effective service delivery.

From the result, being up-to-date with emerging digital technologies in the library field ($\bar{x}$ = 3.62, SD = 0.65) is ranked first, the ability to navigate and use library management software ($\bar{x}$ = 3.57, SD = 0.63) is ranked second among others, while the ability to collaborate with other library staff on digital initiatives ($\bar{x}$ = 3.17, SD = 0.96) is ranked last. The findings from the quantitative data in Table 2 above indicate that, digital skills possessed by librarians for effective service delivery, and being up-to-date with emerging digital technologies in the library field is digital skills highly possessed, while familiarity with electronic databases and search techniques, and proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians among others are moderately possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria.

Hypothesis One
There is no significant difference in the mean responses of male and female librarians in the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria.

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Table 3: Independent sample t-test analysis of the mean responses of male and female librarians in the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria

	Gender	Mean	SD	t-value	Df	Sig. value	Dec.
Digital skills possessed for effective service delivery	Male	3.32	0.47	-0.37	232	0.71	NS
	Female	3.34	0.46				

$\alpha = 0.05$, NS = Not Significant

Table 3 shows an independent sample t-test analysis of the mean responses of male and female librarians with respect to the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria. Result showed that a t-value of -0.37 with a degree of freedom (df) of 232 and a significant or probability value of 0.71 was obtained. Since the probability value of 0.71 is greater than 0.05 level of significance set as bench mark, the null hypothesis which stated that there is no significant difference in the mean response of male and female librarians with respect to the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria, is accepted. Inference drawn is that, librarians' gender is not a significant factor in determining the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria.

Major Findings of the Study

From the result of data analysis and interpretation, the following findings emerge:

- The study identified relevant digital skills needed for librarians such as ability to navigate and use library management software, skills in evaluating the credibility and reliability of online information sources among others
- The ability to navigate and use library management software is highly possessed among others are widely possessed, while familiarity with electronic databases and search techniques, and proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians among others are moderately possessed with no significant gender differences.

Discussion and Conclusion

Relevant Digital Skills Needed by Librarians for Effective Service Delivery in University Libraries in North-Central, Nigeria

The first research question sought to identify the relevant digital skills needed by librarians for effective service delivery in university libraries in North-Central, Nigeria. The result shows that, the ability to navigate and use library management software, skills in evaluating the credibility and reliability of online information sources, familiarity with electronic databases and search techniques, and proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians among others are the relevant digital skills

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highly needed by librarians for effective service delivery in university libraries in North-Central, Nigeria. The finding is feasible because this align with the current trends and demands in the field of library and information science, especially in the context of university libraries, where these skills are crucial for providing high-quality services in learning, teaching, and research.

These findings are consistent with Abdullahi, Amao, Abubakar and Ibrahim (2024) and Ekwueme, Oluwaseun, Ofodu and Ambrose (2024), who state that the ability to navigate the internet effectively is one of the essential skills for librarians in delivering effective services. Furthermore, Onakoya et al. (2023) support that an academic librarian must be skilled in searching databases, operating open-source software, and using CD-ROMs, among others. Similarly, Barfi et al. (2023) found that librarians require user assessment skills, such as electronic instruction and the evaluation of reference queries, for effective service delivery. The finding above shows that for librarians in university libraries in North-Central Nigeria to effectively meet the demands of modern library users, they need to possess a comprehensive set of digital skills. Hence these digital skills are critical for facilitating learning, teaching, and research within university environments.

Digital Skills Possessed by Librarians for Effective Service Delivery in University Libraries in North-Central, Nigeria

The second research question sought to identify the digital skills possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria. The result shows that, the ability to navigate and use library management software, and being up-to-date with emerging digital technologies in the library field is essential for librarians are the digital skills highly possessed by librarians for effective service delivery in university libraries in North-Central, Nigeria, while familiarity with electronic databases and search techniques, and proficiency in utilizing digital resources such as e-books and online journals is necessary for librarians among others are moderately possessed. However, the hypothesis tested shows that there is no significant difference in the mean responses of male and female librarians regarding the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria.

The finding may be possible because digital skills, particularly those related to emerging technologies, library management software, electronic databases, and effective communication in digital environments, are essential competencies that transcend gender. Consequently, both male and female librarians are likely to receive similar training and professional development opportunities, leading to comparable levels of proficiency in these areas. Moreover, the nature of the work in university libraries requires all librarians, regardless of gender, to possess these digital skills to meet the demands of modern library users effectively. As a result, any differences in skill levels between male and female librarians are minimal or non-existent, which may explain the lack of a significant difference

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in their mean responses concerning the digital skills possessed for effective service delivery in university libraries in North-Central, Nigeria.

These findings are in line with Agunsoye's (2023) findings, which revealed that academic library personnel in Kogi State possess interpersonal communication skills to a great extent, and these skills are quite effective in reference and information service delivery. Furthermore, Emeasoba, Akudolu and Agbo (2022) study shows no significant difference in the mean ratings of male and female business educators regarding the extent to which mobile phones, the internet, and smart boards are utilized in teaching and learning of Business Education in public universities in South-South, Nigeria. However, the findings disagree with those of Ayoku and Okafo (2015), which showed that many librarians do not know how to evaluate and catalogue e-resources; have no knowledge of subject gateways, specialized databases, and some open-access library databases; have no knowledge of database management; are not skilled in web design; and are equally unfamiliar with web design applications. The findings also disagree with David-West (2022), which revealed that LIS educators do not have the necessary skills to navigate the online environment for teaching without assistance. The finding therefore shows that librarians possessed digital skills for effective service delivery in university libraries in North-Central, Nigeria. This suggests that both male and female librarians might have undergone training and professional development programmes for upskilling with the necessary digital skills. The minimal or non-existent differences in skill levels between male and female librarians highlight the effectiveness of these programmes and emphasise the need for continuity of provision of equal opportunities for all librarians to acquire and develop these digital skills.

Conclusion

The findings of this study reveal that librarians in university libraries in North-Central Nigeria possess a good level of the digital skills required for effective service delivery. The results indicate that key competencies such as the ability to navigate and use library management software and staying up-to-date with emerging digital technologies are highly possessed, while other essential skills including familiarity with electronic databases, proficiency in utilizing digital resources, online instruction, and content evaluation are moderately possessed. Additionally, the study found no significant difference in the digital skills possessed by male and female librarians.

These outcomes suggest that librarians in North-Central Nigerian university libraries have responded reasonably well to the digital transformation in their profession. The possession of these competencies enables them to effectively manage electronic resources, provide virtual reference services, support users in digital environments, and contribute meaningfully to teaching, learning, and research activities. However, since most skills were rated as moderately possessed, there is still room for continuous improvement, especially in advanced

areas such as data management, web technologies, and digital content curation, to fully align with evolving global standards.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. University library management in North-Central Nigeria should prioritise structured and continuous professional development programmes for librarians. This should include regular workshops, seminars, and hands-on training on advanced digital skills such as web design, data management and curation, institutional repository management, artificial intelligence applications, and digital content creation.
2. Library administrators and university management should provide institutional sponsorship and support for librarians to acquire advanced digital competencies. This may involve funding participation in specialised ICT training, certification programmes, and conferences focused on emerging library technologies.
3. A deliberate policy on lifelong learning and digital upskilling should be developed and implemented in university libraries. This policy should encourage and recognise self-initiated learning while moving beyond informal methods (such as trial and error or peer mentoring) to more systematic and structured capacity-building approaches.

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