

APPLICATION OF EMERGING TECHNOLOGIES FOR EFFICIENT SERVICES DELIVERY IN UNIVERSITY LIBRARIES IN DELTA STATE

BY

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Abstract:

Purpose: This study investigated the application of emerging technologies for efficient service delivery in university libraries in Delta State, Nigeria.

Design/Methodology/Approach: The study adopted a descriptive survey research design. A census sampling technique was employed to cover all 92 professional librarians in the selected university libraries, out of which 80 valid responses were obtained and analyzed. Data analysis was carried out using frequency counts, percentages, mean scores, and standard deviation.

Findings: The findings revealed that emerging technologies such as automated library systems and digital institutional repositories are largely available in university libraries. However, the overall level of utilization of these technologies remains low, especially with respect to advanced tools such as artificial intelligence and virtual reference services. The study further identified major challenges hindering effective application, including inadequate funding, poor internet connectivity, irregular power supply, lack of technical skills, and weak institutional support.

Implication: The study highlights the need for improved infrastructure, continuous training of librarians, and stronger institutional and policy support to bridge the gap between availability and effective utilization of emerging technologies for enhanced service delivery.

Originality/Value: This study contributes to existing literature by providing a comprehensive investigation into the availability, utilization, and challenges of emerging technologies for efficient service delivery in university libraries in Delta State, Nigeria. Unlike previous studies that focused on specific digital tools or competencies, the study integrates multiple emerging technologies within a single framework and links them directly to service efficiency.

Keywords: Emerging Technologies; Service Delivery; University Libraries; Information Technology Application;

Paper Type: Empirical Research

Introduction

University libraries remain central to the advancement of teaching, learning, and research in higher education institutions, serving as critical hubs for information access and knowledge dissemination. In recent times, the role of librarians has evolved significantly due to the rapid development of emerging technologies,

shifting from traditional information custodians to active facilitators of digital knowledge services. This transformation has necessitated the adoption of innovative tools and systems to enhance efficiency and improve service delivery. According to Saibakumo (2021), the awareness and acceptance of emerging technologies among librarians are essential for extending and

improving information services in academic libraries. Similarly, Yusuf et al. (2022) emphasize that technologies such as artificial intelligence can significantly enhance service delivery by automating routine operations and improving access to information resources.

In the context of Delta State, the integration of emerging technologies into university libraries has become increasingly important for meeting the information needs of users. Studies have shown that librarians are gradually adopting various digital tools to enhance service provision. For instance, Ogunbodede and Ivwighrehweta (2020) found that social media platforms such as Facebook and WhatsApp are widely used by librarians in Edo and Delta States to promote library services, create awareness, and communicate with users. Likewise, Obuh and Ogbomo (2024) reported that librarians in Delta State possess moderate to high levels of skills in the use of web technologies, including OPAC, cloud computing, and instant messaging tools, which contribute to improved information service delivery. In addition, Umukoro and Edewor (2025) observed that Web 2.0 technologies are effectively utilized for promoting services such as reference assistance, user communication, and selective dissemination of information.

Despite these advancements, several challenges continue to hinder the effective application of emerging technologies in university libraries. Ofoma and Nwafor-Orizu (2022) revealed that although librarians demonstrate reasonable knowledge of web applications, their actual utilization for service delivery remains relatively low. Similarly, Owate (2024) noted that while librarians are aware of various digital applications, many advanced tools such as virtual reality, digital collaboration platforms, and QR code technologies are underutilized due to limited skills and infrastructural constraints. Furthermore, Abu and Musa (2025) highlighted that the adoption of artificial intelligence in Nigerian academic libraries is still at an early stage, largely due to inadequate technical expertise, poor infrastructure, and concerns related to data management.

These limitations indicate a gap between the availability of emerging technologies and their effective application in library services. Challenges such as unstable power supply, insufficient funding, lack of enabling policies, and inadequate training continue to restrict optimal utilization of these technologies. Consequently, there is a need for a focused investigation into how emerging

technologies can be effectively applied to enhance service delivery in university libraries. Therefore, this study seeks to examine the application of emerging technologies for efficient service delivery in university libraries in Delta State, with a view to identifying existing challenges and proposing practical strategies for improvement in line with global best practices.

Statement of the Problem

Contemporary developments in academic librarianship indicate a strong shift toward the adoption of emerging technologies to enhance efficient, user-centered, and innovative service delivery in university libraries. Technologies such as artificial intelligence, Web 2.0 tools, mobile applications, cloud computing, and digital repositories are increasingly being utilized to facilitate real-time access to information, improve reference services, and support research activities. Studies have shown that librarians are progressively acquiring competencies in the use of web-based technologies and social media platforms to promote library services and engage users more effectively. Additionally, the integration of intelligent systems and digital applications has been identified as a critical factor in improving operational efficiency, expanding access to resources, and

increasing user satisfaction in modern academic libraries.

However, despite these advancements, there is evidence that the practical application of these emerging technologies in many university libraries, particularly in Delta State, remains suboptimal. While some studies report moderate to high levels of awareness and competence among librarians, actual utilization of several advanced technologies such as artificial intelligence tools, digital preservation systems, and collaborative digital platforms remains limited. Furthermore, challenges such as inadequate technological infrastructure, inconsistent power supply, insufficient funding, and gaps in technical expertise continue to hinder effective implementation. There is also limited empirical evidence focusing specifically on how these emerging technologies are applied to achieve efficient service delivery within the context of university libraries in Delta State. Consequently, a gap exists between the current global trends in technology-driven library services and the realities within the local context. This brought the need for a focused investigation into the application of emerging technologies for efficient service delivery in university libraries in Delta State, with a view to identifying existing limitations and

proposing context-relevant strategies for improvement.

Purpose of the Study

The main purpose of this study is to investigate the application of emerging technologies for efficient service delivery in university libraries in Delta State, Nigeria. Specifically, the study seeks to:

1. Identify the emerging technologies available for efficient service delivery in university libraries in Delta State.
2. Examine the level of utilization of emerging technologies by librarians for efficient service delivery.
3. Determine the challenges affecting the application of emerging technologies in university libraries in Delta State.
4. Proffer strategies for enhancing the effective application of emerging technologies for efficient service delivery in university libraries in Delta State.

Conceptual Framework

The following concepts are examined and reviewed in relation to the study:

Emerging Technologies

Emerging technologies refer to advanced and evolving digital innovations that are reshaping how information is created, managed, and disseminated in academic environments. In university

libraries, tools such as artificial intelligence, blockchain systems, cloud computing, Internet of Things (IoT), and smart library applications have transformed traditional library practices into more automated and user-responsive systems. Khalid and Makama (2025) emphasize that awareness and utilization of emerging technologies significantly enhance service effectiveness in university libraries. Similarly, Ajani, Adeyinka, and Salawu (2022) note that librarians' readiness to adopt artificial intelligence is central to modernizing library operations and improving service delivery. The increasing conceptualization of smart libraries also reflects this shift, where digital ecosystems are designed to support seamless access to information and intelligent service provision (Cao, Liang, & Li, 2018; Gul & Bano, 2019). Adetimirin (2019) further adds that innovations such as blockchain enhance transparency and security in information management processes. However, Mittal (2017) observes that despite the growing awareness of these technologies, their integration remains uneven due to infrastructural and competency-related limitations.

Service Delivery

Service delivery in university libraries involves the processes and systems through which information services are provided to

users in an efficient, accessible, and timely manner. It encompasses reference services, digital access services, resource sharing, and virtual information support. Chukwueke and Onuoha (2019) explain that ICT integration has significantly reshaped service delivery by improving accessibility and expanding user engagement in academic libraries. In the same direction, Makwana (2021) notes that digital tools such as IoT applications enhance real-time interaction between users and library systems. The shift toward intelligent and automated services has also been reinforced by Cox, Pinfield, and Rutter (2018), who argue that artificial intelligence is redefining how library services are delivered in academic environments. However, Omeluzor and Oyovwe-Tinuoye (2016) caution that the effectiveness of service delivery depends largely on the level of system integration and technological adoption within libraries. Despite these advancements, Sahabi and Otobo (2021) report that many Nigerian academic libraries still struggle with inconsistent service delivery due to infrastructural and technical constraints, which limits user satisfaction and overall efficiency.

University Libraries

University libraries are academic support institutions established to facilitate teaching, learning, research, and knowledge

dissemination within higher education systems. They serve as intellectual hubs that provide access to both print and digital resources for students, researchers, and faculty members. John-Okeke and Anasi (2022) highlight that modern university libraries are increasingly expected to support institutional repositories and promote open access initiatives as part of their core functions. Okojie and Okiy (2020) further emphasize that university libraries contribute significantly to national development by enhancing information accessibility and supporting academic advancement. The growing integration of digital technologies has also redefined their roles, making them central to open science and knowledge sharing practices (Liu & Liu, 2023). Oyovwe-Tinuoye, Omeluzor, and Patrick (2021) note that the effectiveness of university libraries is closely tied to librarians' ICT skills and competencies. However, Ponelis and Adoma (2018) observe that the level of technological adoption varies across African university libraries, often influenced by institutional capacity and policy support. This variation highlights the need for continuous modernization of university libraries to meet global standards.

Information Technology Application

Information technology application in university libraries refers to the use of digital tools, systems, and platforms to enhance library operations and service delivery. These include integrated library systems, cloud computing platforms, artificial intelligence tools, and digital repositories. Aliyu, Abdulrahman, and Yusuf (2019) stress that cloud computing adoption is essential for improving efficiency and accessibility in academic library services. Similarly, George, Okwu, and Ogunbodede (2022) note that digital literacy significantly influences librarians' job performance and their ability to effectively apply IT tools in service delivery. Okeji, Tralagba, and Obi (2020) further emphasize that knowledge-based competencies are critical for successful utilization of ICT in library environments. The use of integrated library systems has also been identified as a major driver of automation in academic libraries, improving cataloguing and resource management processes (Omeluzor & Oyovwe-Tinuoye, 2016). However, Mishra (2019) observes that the level of digital information literacy among library users and professionals directly affects the success of IT application. Despite these benefits, challenges such as inadequate infrastructure and limited

training continue to hinder full-scale implementation of IT solutions in many libraries (Sahabi & Ootobo, 2021).

Library Efficiency

Library efficiency refers to the ability of university libraries to deliver services accurately, promptly, and effectively while maximizing available resources. It is measured by the speed of service delivery, user satisfaction, resource utilization, and system reliability. Baryshev, Verkhovets, and Babina (2018) argue that smart library systems significantly improve operational efficiency by automating routine processes and enhancing information access. Similarly, Cao, Liang, and Li (2018) explain that intelligent library models are designed to optimize service performance through data-driven decision-making and automation. Gul and Bano (2019) further note that smart technologies contribute to improved efficiency by reducing manual workload and increasing service responsiveness. Ponelis and Adoma (2018) add that open-source systems also support cost-effective library operations, thereby enhancing efficiency in resource-constrained environments. However, Mittal (2017) observes that efficiency gains are often limited by poor technological infrastructure and inadequate staff competencies. Consequently, the level of library efficiency

in many academic institutions remains dependent on the extent to which emerging technologies are effectively adopted and integrated into service delivery processes.

Review of Related Empirical Literature

The following literatures were reviewed in line with the study

Ogunbodede and Ivwighrehweta (2020) investigated Librarians use of social media in promoting effective library service delivery in university libraries in Edo and Delta States. The study adopted descriptive survey design. The population of the study comprised of 71 librarians from twelve university libraries. Three (3) research questions guided this study. Data was collected using online questionnaire. The total enumerative sampling technique was used for this study. The validity of the instrument was determined by checking the face and content validity and the instrument proved valid because the items in the instrument are appropriate in terms of subject contents. Cronbach Alpha technique was used to determine the reliability coefficient of the instrument and an index of 0.87 was obtained. This shows that the internal consistency of the instrument is high and good. Data was analyzed with descriptive statistics such as frequency count and simple percentage. The findings revealed that majority of the librarians

mostly use Facebook and Whatsapp platforms in providing library services. On the library services that are performed using social media, it was discovered that most of the respondents use the social media platforms to create awareness about library resources and services and also to share library news and events. Majority of the respondents indicated that poor internet connection and lack of constant power supply were the two major challenges to the effective use of social media platforms. Both the previous study and the present study share similarities in their adoption of a descriptive survey design, use of census sampling techniques, and focus on librarians' use of technology to enhance service delivery in university libraries. However, while the previous study was limited to the use of social media platforms for service promotion in Edo and Delta States, the present study is broader in scope as it examines multiple emerging technologies, including artificial intelligence, cloud computing, and digital repositories, specifically within Delta State. In addition, the present study goes beyond usage to assess availability, level of utilization, and associated challenges affecting efficient service delivery. The gap created by the previous study lies in its narrow technological focus and limited

analytical scope, which the present study addresses by providing a more comprehensive evaluation of emerging technologies and their role in achieving efficient library service delivery.

Obuh and Ogbomo (2024) investigated librarians' skills and the application of web technologies for information service delivery in university libraries in Delta State. Four research questions guided the study. The study adopted a descriptive research design, with a population figure of 170 librarians from university libraries across Delta State. The total enumeration sampling technique was employed. Data were collected using a questionnaire entitled "Librarians' Skills and Application of Web Technologies for Information Service Delivery Questionnaire (LSAWTISDQ)." Data analysis was achieved with the use of descriptive statistics (frequencies, mean, and standard deviation) to answer the research questions using the decision rule that reflects mean scores. According to the findings, most librarians at Delta State University libraries use a variety of web technologies for information service delivery. They have intermediate knowledge of web technologies and use them extensively for service delivery. To a high extent, these libraries offer a wide range of information services.

The study concluded that, as online applications evolve, librarians in university libraries in Delta State can effectively use tools like OPAC, cloud computing, QR codes, wikis, instant messaging, and Twitter. Both the previous study and the present study are similar in their use of a descriptive survey design, census sampling technique, and focus on the use of technology for enhancing service delivery in university libraries in Delta State. However, the previous study concentrated specifically on librarians' skills and the application of web technologies, whereas the present study adopts a broader perspective by examining the availability, level of utilization, and challenges associated with a wider range of emerging technologies. Furthermore, the present study extends beyond assessing skills and usage to include efficiency in service delivery as a key outcome. The gap identified in the previous study is its limited scope to web technologies and skills, which the present study addresses by providing a more comprehensive evaluation of emerging technologies and the factors influencing their effective application in university libraries.

Umukoro and Edewor (2025) explored Librarians' competencies towards Web 2.0 usage for promoting services in university libraries in Delta and Edo States,

Nigeria. A descriptive-correlational research approach was employed for the study. The study population particularly contains 184 librarians engaged in the State, Federal, and Private libraries affiliated with the universities in Delta and Edo States. The study sample size comprises 184 librarians using the total enumeration sampling technique. Using a structured questionnaire, information was gathered from the participants. Descriptive statistics, including frequency count, percentage, mean, and standard deviation, were used to analyse the data to answer the study objectives. The results showed that the librarians at the university libraries in Delta and Edo States, Nigeria, are highly competent in using Web 2.0 platforms for the promotion of their services. The librarians reported that WhatsApp and Facebook are the two platforms they use the most to promote their services, with other tools being utilized less sparingly. Reference services, communication with library patrons, and the selective dissemination of information services are among the services that are most frequently promoted via Web 2.0 platforms. The primary challenges preventing the use of Web 2.0 platforms in university libraries are inadequate funding, poor internet connectivity, lack of technical skills, and institutional support, among

others. Both the present and previous studies share similarities in their adoption of descriptive survey approaches, use of questionnaires for data collection, and focus on the role of technology in enhancing service delivery in university libraries. However, while the previous study concentrated specifically on librarians' competencies in using Web 2.0 tools for service promotion across Delta and Edo States, the present study takes a broader perspective by examining the availability, level of utilization, and challenges of diverse emerging technologies within university libraries in Delta State alone.

Furthermore, the previous study emphasized competence and usage of specific platforms such as WhatsApp and Facebook, whereas the present study evaluates a wider range of technologies including artificial intelligence, cloud systems, and digital repositories. The gap identified lies in the limited scope of earlier research, which did not comprehensively assess the availability and extent of utilization of emerging technologies nor provide a holistic analysis of the challenges affecting their application, which the present study seeks to address.

Ofoma and Nwafor-Orizu (2022) studied Librarians' knowledge and use of web applications for effective services in

academic libraries in Anambra State, Nigeria. Descriptive survey design was adopted for the study which involved 120 librarians and library staff in four academic libraries. Four research questions and two hypotheses guided the study. The two instruments used were validated by two senior lecturers in the Department of Library and Information Science and one expert in measurement and Evaluation. The reliability of the WAKT (Web Application Knowledge Test) was calculated using the Kuder-Richarchson K-20 formula with reliability coefficient of 0.98; while Cronbach Alpha was used to calculate the reliability coefficient of WAUQ (Web Applications Use Questionnaire) with coefficient 0.75, 0.82, 0.84 for section A, B, C respectively. Percentages, frequencies and mean ratings were used to answer the research questions. T-test was used to test hypotheses at 0.05 level of significance. The major findings of the study included among others, those librarians from state institutions understood more the meaning of web applications than their counterparts in federal institutions, while the librarians from federal institutions understood more of the use process of web applications. However, the aggregate average of all the librarians is above the pass mark of 50%, but the average use of web applications in rendering library services,

online delivery of tutorials is low. No significant difference was found in the mean achievement scores of librarians in federal and state institutions on their level of knowledge of web applications. Both the present and previous studies share similarities in their use of descriptive survey design, questionnaire instruments, and focus on the application of technology for enhancing library service delivery. However, the previous study focused specifically on librarians' knowledge and use of web applications in academic libraries in Anambra State, including hypothesis testing, whereas the present study adopts a broader scope by examining the availability, level of utilization, and challenges of diverse emerging technologies in university libraries in Delta State using only descriptive statistics. In addition, the previous study emphasized knowledge levels and comparative analysis between institutions, while the present study evaluates practical application and efficiency of multiple emerging technologies such as artificial intelligence, cloud systems, and digital repositories. The gap identified is that earlier research did not comprehensively assess the availability and extent of utilization of a wide range of emerging technologies nor address the associated challenges in a

holistic manner, which the present study seeks to fill.

Owate (2024) investigated Knowledge and utilization of digital applications for effective service delivery in academic libraries in South-South universities, Nigeria. 3 research questions and 3 hypotheses were raised. The population included 181 selected Librarians in the twelve (12) selected universities in South-South, Nigeria as a case study. A sample size of 119 Librarians representing 66% of the population served as respondents. Convenience sampling technique was used for the study. A 25-item questionnaire was used for data collection. Cronbach alpha statistics was used to obtain 0.73 reliability. Mean/standard deviation were used for research questions and z-test statistics was used to test the hypotheses at 0.05 level of significance. The result amongst others revealed that, Librarian in both federal and state universities are knowledgeable about Library Catalogue Apps, Library Card and Account Management Apps, Digital Preservation and Archives Apps and others. Meanwhile, Librarians in both federal and state universities poorly utilize Digital Citation Management Apps, Digital Library Card and Account Management Apps and Digital Preservation and Archives Apps. The

analysis also shows that, Librarians do not utilize Digital Augmented and Virtual Reality Apps, Digital Library Events and Notifications Apps, Reading and E-Book Apps, Digital Study and Collaboration Apps and Quick Response (QR) Codes scanners. The challenges academic libraries face in promoting digital applications are inadequate skilled staff to operate digital libraries, difficulty in the enforcement of intellectual property rights, non-utilization of digital library Apps. Both the present and previous studies share similarities in their focus on the role of technology in enhancing service delivery in academic libraries, as well as the use of questionnaire instruments and descriptive statistical tools such as mean and standard deviation. However, the previous study examined knowledge and utilization of digital applications across South-South universities using a sampled population and inferential statistics, whereas the present study adopts a census approach and focuses specifically on the availability, level of utilization, and challenges of a broader range of emerging technologies in university libraries in Delta State.

Furthermore, while the previous study emphasized knowledge and identified underutilization of specific digital applications, the present study provides a more comprehensive assessment by

incorporating availability and infrastructural challenges affecting effective application. The gap in the previous study lies in its limited scope regarding emerging technologies and lack of detailed analysis of availability and contextual challenges, which the present study addresses to provide a more holistic understanding of efficient service delivery.

Research Methodology

The study adopted a descriptive survey using questionnaire to collect data. The study adopted a descriptive survey research design. A census (total

enumeration) sampling technique was employed to select 92 professional librarians from selected university libraries in Delta State. The entire population was manageable and therefore, there was no sampling. A total of 92 questionnaires were distributed only 80 were retrieved and used for the study. Descriptive statistics, (mean and percentage) were used for analysis. A mean score of 2.5 and above and a percentage score of 50% were considered for decision making.

Interpretation of Result.

Table 1: Distribution and Return Rate of Questionnaires

S/N	Description	Frequency	Percentage (%)
1	Number of questionnaires distributed	92	100%
2	Number of questionnaires returned	80	87%
3	Number of questionnaires not returned	12	13%
	Total	92	100%

The table on distribution and return rate of questionnaires shows that 92 questionnaires were administered to respondents, representing 100% of the study population. Out of these, 80 questionnaires were correctly completed and returned, representing a response rate of 87%, while 12 questionnaires, representing 13%, were

not returned. The high return rate indicates a good level of participation among respondents, suggesting that the data collected is reliable and suitable for analysis. It also implies that the findings of the study are sufficiently representative of the target population and can be generalized with confidence.

Availability of Emerging Technologies for Efficient Service Delivery in University Libraries in Delta State

Table 2

S/N	ITEMS	A	%	NA	%
1	Mobile library applications	52	65	28	35
2	Cloud-based library management systems	48	60	32	40
3	Artificial intelligence tools (e.g., chatbots)	30	38	50	62
4	Digital institutional repositories	60	75	20	25
5	Automated library systems (e.g., KOHA)	65	81	15	19
6	Virtual reference services (live chat)	42	53	38	47

A= Available, NA=Not Available

The results in table 2 indicate that several emerging technologies are available in university libraries in Delta State, though at varying levels. Automated library systems (81%) and digital institutional repositories (75%) recorded the highest availability, showing strong integration of core library technologies. Mobile library applications (65%) and cloud-based systems (60%) were moderately available, suggesting ongoing adoption. However, artificial intelligence tools (38%) and virtual reference services

(53%) were less available, indicating limited deployment of advanced and interactive technologies. Overall, the findings suggest that while foundational digital systems are present, more advanced emerging technologies are still at an early stage of implementation. It can therefore be inferred that the several emerging technologies are available in university libraries in Delta State, though at varying levels. The findings correspond with the results of a study conducted

Level of Utilization of Emerging Technologies for Efficient Service Delivery in University Libraries in Delta State

Table 3

S/N	ITEMS	VHU	HU	LU	VLU	$\bar{x}$	SD
1	Mobile library applications	12	22	28	18	2.34	1.01
2	Cloud-based systems	14	20	30	16	2.40	1.03
3	Artificial intelligence tools	10	18	32	20	2.15	0.99
4	Digital repositories	24	26	18	12	2.72	1.02
5	Automated systems (KOHA)	28	30	14	8	2.95	0.96
6	Virtual reference services	12	20	28	20	2.30	1.04
Cluster Mean						2.48	

Key: VHU = Very High Utilized, HU = High Utilized, LU = Low Utilized, VLU = Very Low Utilized

Table 3 reveals that the overall level of utilization of emerging technologies in

university libraries in Delta State is low, with a cluster mean of 2.48, which is slightly

below the benchmark of 2.50. Automated library systems ($\bar{x} = 2.95$) and digital repositories ($\bar{x} = 2.72$) were the most utilized technologies, indicating their importance in daily library operations. Conversely, mobile applications, cloud-based systems, artificial intelligence tools, and virtual reference services recorded low utilization levels. This suggests that although some technologies are available, their full integration into service delivery processes is still limited. The findings of the

study corroborate those of Owate (2024), who found that librarians in both federal and state universities were knowledgeable about some emerging applications, while they exhibited limited knowledge of others. This implies that librarians in Delta State are not fully maximizing emerging technologies for effective service delivery; therefore, they should strive to participate in training programmes that will enable them to fully utilize these emerging technologies.

Challenges Affecting the Application of Emerging Technologies in University Libraries in Delta State

Table 4

S/N	ITEMS	SA	A	D	SD	$\bar{x}$	SD
1	Inadequate funding	38	30	10	4	3.25	0.88
2	Poor internet connectivity	36	29	9	6	3.20	0.90
3	Lack of technical skills	32	31	11	6	3.12	0.92
4	Irregular power supply	40	28	8	4	3.30	0.86
5	Lack of institutional support	30	30	12	8	3.00	0.95
6	Resistance to change	22	28	20	10	2.80	1.01
Cluster Mean						3.11	

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Table 4 shows that respondents agreed that several challenges hinder the application of emerging technologies in university libraries, with a cluster mean of 3.11. The most significant challenges include irregular power supply ($\bar{x} = 3.30$), inadequate funding ($\bar{x} = 3.25$), and poor internet connectivity ($\bar{x} = 3.20$). Lack of technical skills and institutional support were also identified as important constraints, while resistance to change was the least rated but still recognized as a limiting factor.

Umukoro and Edewor (2025) supported the findings of this study by revealing that the major challenges hindering the use of emerging technologies in university libraries include inadequate funding for implementation, the absence of supportive policies, and unstable power supply, among others. This calls on university library administrators to ensure the provision of adequate funding, supportive policies, and alternative power supply systems. These measures will enable librarians to fully

maximize the benefits of emerging technologies for effective service delivery.

CONCLUSION

The study concluded that emerging technologies have become essential tools for improving service delivery in university libraries in Delta State. The findings revealed that technologies such as automated library systems and digital institutional repositories are available in many university libraries and contribute significantly to modern library operations. However, the overall level of utilization of these technologies remains low, particularly in the use of advanced technologies such as artificial intelligence tools, cloud-based systems, and virtual reference services. This indicates that despite the growing awareness and availability of digital innovations, many librarians are yet to fully integrate these technologies into effective and efficient library service delivery.

The study further concluded that several challenges continue to hinder the effective application of emerging technologies in university libraries in Delta State. Major constraints identified include inadequate funding, poor internet connectivity, irregular power supply, lack of technical skills, and weak institutional support. These challenges have limited

librarians' ability to maximize the benefits of emerging technologies for improved service efficiency and user satisfaction. Therefore, the study emphasizes the need for adequate funding, continuous training and retraining of librarians, improved technological infrastructure, stable power supply, and supportive institutional policies to enhance the effective utilization of emerging technologies for efficient service delivery in university libraries in Delta State.

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