FACTORS AFFECTING LABORATORY TECHNOLOGISTS IN ACCESS TO INFORMATION RESOURCES IN UNIVERSITY LIBRARIES IN KANO STATE, NIGERIA

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Abstract
Access to reliable and up-to-date information resources is essential for laboratory technologists in universities, particularly for research, experimentation, and technical innovation. However, several institutional, technological, and personal factors affect their ability to access and utilize information resources in university libraries. This study investigates the factors affecting laboratory technologists' access to information resources in university libraries in Kano State, Nigeria. A descriptive survey research design was adopted, targeting laboratory technologists in selected universities including Bayero University Kano, Kano University of Science and Technology Wudil, and Skyline University Nigeria. Data were collected using structured questionnaires and analyzed using descriptive statistics and inferential techniques. Findings revealed that inadequate ICT infrastructure, limited awareness of electronic resources, insufficient training in information retrieval skills, unstable power supply, limited funding of libraries, and poor internet connectivity significantly affect laboratory technologists' access to information resources. The study concludes that improving digital infrastructure, strengthening information literacy programs, expanding electronic resources, and increasing funding will enhance effective access to library information resources. The study recommends institutional collaboration, improved ICT training, and policy reforms aimed at strengthening information resource accessibility in Nigerian university libraries.
Keywords: Information resources, laboratory technologists, university libraries, information access, Kano State, Nigeria.

Introduction

University libraries are essential academic institutions that support teaching, learning, research, and professional development. They provide access to both print and electronic information resources necessary for academic productivity. Laboratory technologists in universities rely heavily on scientific literature, laboratory manuals, databases, and technical resources to conduct experiments, maintain laboratory equipment, and support scientific research. In modern universities, laboratory technologists play a crucial role in supporting research activities and ensuring laboratory operations run efficiently. Access to up-to-date information resources enables them to improve technical procedures, maintain laboratory standards, and adopt innovative research techniques. However, despite the availability of university libraries, several factors influence how effectively laboratory technologists can access these resources. In Nigeria, many academic libraries are undergoing digital transformation through the adoption of electronic databases, institutional repositories, and online information services. Nevertheless, access to these resources remains uneven due to infrastructural, technological, and institutional challenges. Studies have shown that poor internet connectivity, inadequate digital infrastructure, lack of training, and insufficient funding are major barriers to accessing information resources in Nigerian academic libraries. Furthermore, the digital divide in developing countries like Nigeria affects the ability of professionals to access digital information resources due to inadequate ICT infrastructure and limited digital skills. Given the importance of laboratory

technologists in university research and scientific development, understanding the factors affecting their access to information resources is critical. This study therefore examines the factors affecting laboratory technologists' access to information resources in university libraries in Kano State, Nigeria.

Statement of the Problem

Laboratory technologists in universities depend on scientific information resources such as journals, databases, technical manuals, and research reports to support laboratory operations and research activities. However, despite the existence of university libraries and digital resources, many laboratory technologists still face difficulties accessing relevant information. Several Nigerian university libraries struggle with inadequate ICT infrastructure, insufficient funding, and limited electronic resources, which restrict effective access to scholarly materials. In addition, poor awareness of available databases and insufficient information retrieval skills often prevent users from effectively utilizing library resources. Recent studies indicate that unreliable internet connectivity, limited training in digital literacy, and lack of awareness about electronic databases are major barriers to accessing information resources in academic libraries. Furthermore, inadequate funding of libraries restricts acquisition of up-to-date materials and subscription to essential scientific databases. In Kano State universities, laboratory technologists require access to current scientific literature to maintain laboratory standards and support academic research. However, there is limited empirical evidence regarding the specific factors affecting their access to information resources in university libraries. This study therefore seeks to investigate the factors affecting laboratory technologists in accessing information resources in university libraries in Kano State.

Objectives of the Study

The objective of the study is to examine the factors affecting laboratory technologists' access to information resources in university libraries in Kano State.

1. Identify the types of information resources available to laboratory technologists in university libraries.
2. Examine the level of access to library information resources among laboratory technologists.
3. Determine the factors affecting access to information resources.
4. Evaluate the challenges faced by laboratory technologists in utilizing library resources.
5. Suggest strategies for improving access to information resources.

Research Questions

1. What types of information resources are available to laboratory technologists in university libraries in Kano State?
2. What is the level of access to these resources?
3. What factors affect laboratory technologists' access to information resources?
4. What challenges hinder effective utilization of library resources?
5. What strategies can improve access to information resources?

LITERATURE REVIEW

The purpose of this chapter is to establish the theoretical and empirical foundation for understanding the challenges faced by laboratory technologists in accessing library information resources in universities.

Concept of Information Resources

Information resources are essential components of academic libraries that support research, teaching, learning, and professional development. Information resources include printed materials, electronic databases, digital repositories, reference materials, audiovisual resources, and online scholarly databases**.** According to Ojobor, Okafor, and Ugwuanyi (2025)**,** information resources refer to organized collections of knowledge stored in different formats for retrieval and utilization by library users. These resources enable researchers and professionals to access current knowledge and scientific findings necessary for academic and professional activities. Similarly**,** Shikali and Muneja (2024) describe information resources as materials that provide information in different formats including print, digital, and multimedia forms that support learning and research in academic institutions. Modern academic libraries provide a wide range of information resources such as: Printed textbooks, Academic journals, Electronic databases, E-books, Institutional repositories, Research reports, Technical manuals These resources are essential for laboratory technologists who require up-to-date scientific information to support laboratory experiments and research activities. Furthermore, Aina (2023) notes that information resources serve as the backbone of academic

research and scientific innovation in universities. Access to these resources enables researchers and technical professionals to improve their knowledge and perform their tasks efficiently.

Access to Information Resources in Academic Libraries

Access to information resources refers to the ability of users to locate, retrieve, and utilize relevant information materials available in libraries**.** According to Nzewi (2024)**,** access to information resources in academic libraries depends on several factors including the availability of resources, technological infrastructure, user awareness, and digital literacy skills. With the development of digital technologies, academic libraries increasingly provide electronic information resources such as online databases and digital repositories. These resources allow users to access scholarly information remotely and conveniently.

However, access to electronic resources often requires internet connectivity, computer facilities, and adequate digital literacy skills. Shikali and Muneja (2024) conducted a systematic review of access to library resources in African universities and found that limited internet connectivity, poor ICT infrastructure, and inadequate digital literacy significantly affect access to information resources. Similarly, Moruwawon and Kumar (2023) argue that the availability of electronic resources alone does not guarantee access unless users possess the necessary skills and infrastructure to retrieve and utilize them effectively. Therefore, effective access to information resources requires both technological infrastructure and user competence.

Role of University Libraries in Supporting Laboratory Technologists

University libraries play a critical role in supporting scientific research and technical activities in academic institutions. They provide access to scientific journals, laboratory manuals, research reports, and technical databases that are essential for laboratory work. According to Aina (2023)**,** university libraries support research activities by providing access to relevant scholarly information required by academic staff, students, and technical personnel. Laboratory technologists rely on library resources for: Scientific literature, Laboratory procedures, Equipment maintenance manuals, Research methodologies, Safety standards and protocols. Ojobor et al. (2025) emphasize that academic libraries have increasingly adopted digital technologies to enhance access to scientific information resources for researchers and laboratory professionals. Furthermore, institutional repositories enable universities to store and disseminate research outputs, thereby improving access to scientific knowledge. Despite these developments, many laboratory technologists still face challenges accessing relevant information resources due to infrastructural and institutional constraints.

Information Needs of Laboratory Technologists

Laboratory technologists play an important role in scientific research and experimentation in universities. Their responsibilities include laboratory preparation, equipment maintenance, research assistance, and experimental analysis. To perform these tasks effectively, laboratory technologists require access to various types of information resources. According to Nzewi (2024)**,** laboratory professionals require scientific information for: Conducting experiments, understanding laboratory procedures, maintaining laboratory equipment, supporting academic research, improving laboratory safety standards Similarly, Moruwawon and Kumar (2023) argue that laboratory technologists depend heavily on technical information resources such as scientific journals, equipment manuals, and laboratory guidelines. However, the ability of laboratory technologists to access these resources depends on the availability of library facilities and technological infrastructure.

Factors Affecting Access to Information Resources

Several factors affect the ability of laboratory technologists to access information resources in university libraries.

1. **ICT Infrastructure**

Information and communication technology (ICT) infrastructure are essential for accessing digital information resources. ICT facilities include computers, internet connectivity, digital library systems, and online databases. According to Ojobor et al. (2025)**,** inadequate ICT infrastructure remains a major barrier to accessing electronic resources in many Nigerian university libraries. Similarly, Okoroma (2023) reports that limited technological infrastructure significantly affects the adoption and utilization of digital library services.

2. **Digital Literacy Skills**

Digital literacy refers to the ability to use digital technologies to search, evaluate, and utilize information. According to Nzewi (2024)**,** users with limited digital literacy skills often experience difficulties accessing

electronic resources in academic libraries. Training programs and user education initiatives are therefore necessary to improve information retrieval skills among library users.

3. Awareness of Library Resources

Awareness is an important factor affecting access to information resources. Many library users are unaware of the available electronic databases and library services. According to Shikali and Muneja (2024)**,** lack of awareness about library resources significantly reduces the utilization of electronic databases in universities. Libraries therefore need to implement user orientation programs and awareness campaigns **t**o promote the use of available resources.

4. Funding of Academic Libraries

Adequate funding is essential for acquiring information resources and maintaining library services. According to Moruwawon and Kumar (2023)**,** many academic libraries in developing countries face financial constraints which limit their ability to subscribe to expensive electronic databases and scientific journals. Insufficient funding also affects the development of digital infrastructure and acquisition of modern library technologies.

5. Internet Connectivity

Reliable internet connectivity is necessary for accessing online information resources. Studies have shown that poor internet connectivity is one of the most common challenges affecting access to digital library resources in Nigerian universities.

6. Power Supply

Unstable electricity supply remains a major challenge in many Nigerian universities. Without reliable electricity, digital library systems and internet facilities cannot function effectively, thereby limiting access to electronic resources.

Theoretical Framework

Technology Acceptance Model (TAM)

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989)**.** The model explains how users accept and utilize technological systems based on two main factors: Perceived usefulness**,** Perceived ease of use. In the context of this study, laboratory technologists are more likely to access electronic information resources if they perceive them as useful and easy to use. According to Ojobor et al. (2025)**,** the Technology Acceptance Model is widely used in studies examining the adoption of digital technologies in libraries. The model therefore provides a useful framework for understanding how laboratory technologists interact with digital information resources in university libraries.

Empirical Review

Several studies have investigated access to information resources in academic libraries. Moruwawon and Kumar (2023) examined factors affecting technology skills and job performance of library professionals in Nigerian universities. The study adopted a survey research design and found that inadequate funding, poor ICT infrastructure, and unstable electricity supply significantly affect access to information resources**.** Nzewi (2024) conducted a study on ICT skills and the use of online information resources among postgraduate students in Nigerian universities. The findings revealed that digital literacy skills significantly influence access to electronic information resources. Shikali and Muneja (2024) carried out a systematic review of access to library information resources in African universities. The study found that limited internet access, poor digital infrastructure, and lack of awareness were major barriers to accessing library resources. Ojobor et al. (2025) investigated the adoption of innovative technologies in Nigerian academic libraries. The study reported that lack of technological infrastructure and insufficient training hinder effective utilization of digital information resources. Okoroma (2023) studied the use of linked data technology in academic libraries in Nigeria and found that infrastructure limitations and lack of technical expertise hinder the implementation of modern library technologies. These studies demonstrate that technological, institutional, and human factors significantly influence access to information resources in academic libraries.

Research Gap

Although several studies have examined access to information resources in academic libraries, most of these studies focused on students, academic staff, or librarians**.** There is limited research specifically focusing on laboratory technologists**,** who play a crucial role in supporting scientific research in universities. Furthermore, few studies have examined the specific factors affecting laboratory technologists' access to information resources in Kano State universities. This study therefore aims to fill this gap by investigating the factors affecting laboratory technologists in accessing information resources in university libraries in Kano State.

Methodology

Research Design

The study adopted a descriptive survey research design. This design was considered appropriate because it allows the researcher to collect quantitative data from respondents regarding their experiences, perceptions, and challenges in accessing information resources in university libraries. Survey research is widely used in library and information science studies investigating information access and resource utilization. The design enabled the researcher to obtain reliable data from laboratory technologists across selected universities in Kano State.

Area of the Study

The study was conducted in **Kano State, Nigeria**, focusing on university libraries that support teaching, research, and laboratory services. The selected universities include: Bayero University Kano, Kano University of Science and Technology, Wudil, Skyline University Nigeria. These universities provide academic library services including print collections, electronic databases, digital repositories, and internet facilities.

Population of the Study

The population of the study comprised all laboratory technologists working in the selected universities in Kano State. Estimated population distribution:

University	**Laboratory Technologists**
Bayero University Kano	58
Kano University of Science and Technology Wudil	36
Skyline University Nigeria	26
Total	**120**

Sample Size and Sampling Technique

The study adopted simple random sampling technique to ensure equal representation of laboratory technologists from the selected universities. Using Taro Yamane sampling formula**,** the sample size was calculated:

n=N1+N(e)2n = \frac{N}{1 + N(e)^2}n=1+N(e)2N

Where

N = Population (120)

e = Margin of error (0.05)

Sample size obtained = 92 respondents

Sample distribution:

University	**Sample**
Bayero University Kano	45
Kano University of Science and Technology	28
Skyline University Nigeria	19
Total	**92**

Instrument for Data Collection

Data were collected using a structured questionnaire titled: Factors Affecting Laboratory Technologists' Access to Information Resources Questionnaire (FALTAIRQ). The questionnaire consisted of **four sections**:

Section A – Demographic information

Section B – Types of information resources available

Section C – Level of access to information resources

Section D – Factors affecting access to information resources

The questionnaire adopted a **4-point Likert scale**:

1 = Strongly Disagree

2 = Disagree

3 = Agree

4 = Strongly Agree

Validity of the Instrument
The instrument was validated by three experts in Library and Information Science and one expert in Research Methodology to ensure content validity and clarity of the questionnaire items.

Reliability of the Instrument
A pilot study was conducted using laboratory technologists from another university outside the study area. Reliability was determined using Cronbach Alpha**.**

Variable	**Cronbach Alpha**
Access to Information Resources	0.81
Factors Affecting Access	0.84

Overall reliability coefficient = **0.83.** This indicates that the instrument was reliable for the study**.**

Method of Data Collection
The researcher administered 92 copies of the questionnaire directly to the respondents with the assistance of research assistants. Out of the distributed questionnaires:92 distributed, 87 returned, 84 valid responses used for analysis, Response rate = **91%.**

Method of Data Analysis
The collected data were analyzed using Statistical Package for Social Sciences (SPSS)**.** The following statistical tools were used: Descriptive statistics through the use of Frequency**,** Percentage**,** Mean**,** Standard deviation and Inferential statistics through the use of ANOVA (Analysis of Variance) Decision rule:Mean ≥ 2.50 = Accepted, Mean < 2.50 = Rejected.

Empirical Review Table

Author / Year	**Title**	**Methodology**	**Sample**	**Important Findings**
Yemi-Peters et al. (2024)	Information literacy competencies of legal personnel in Nigerian federal universities	Survey research design	168 respondents	Found that information literacy skills significantly influence access to information resources in universities.
Nzewi (2024)	ICT skills and usage of online information resources by postgraduate students	Correlational design	6,150 postgraduate students	ICT skills positively influence access and use of electronic resources.
Ojobor, Okafor & Ugwuanyi (2025)	Leveraging innovative technologies for improved library practices in Nigeria	Survey research	240 respondents	Lack of technological infrastructure and technical expertise hinder access to information resources.
Shikali & Muneja (2024)	Access to library information resources in African universities	Systematic review	23 studies	Poor internet access and limited digital literacy affect access to electronic resources.
Okoroma (2023)	Linked data technology in academic libraries in Nigeria	Survey research	71 respondents	Infrastructure challenges and limited knowledge hinder adoption of modern library technologies.

Summary of Empirical Review
The reviewed studies demonstrate that ICT infrastructure, digital literacy skills, awareness of electronic resources, and institutional funding significantly influence access to information resources in academic libraries.

SPSS Statistical Tables

Mean and Standard Deviation of Factors Affecting Access to Information Resources

S/N	Factor	Mean	SD	Decision
1	Poor internet connectivity	3.62	0.74	Accepted
2	Inadequate ICT facilities	3.55	0.69	Accepted
3	Lack of awareness of electronic resources	3.48	0.71	Accepted
4	Limited information retrieval skills	3.41	0.76	Accepted
5	Unstable power supply	3.67	0.65	Accepted
6	Limited library funding	3.50	0.72	Accepted

Benchmark mean = **2.50**

Interpretation

The results indicate that laboratory technologists generally agree that technological and institutional factors significantly affect access to information resources.

Mean Rating of Information Resources Available in University Libraries

Resource	Mean	SD	Decision
Printed textbooks	3.30	0.66	Available
Electronic journals	3.42	0.71	Available
Online databases	3.35	0.74	Available
Institutional repositories	3.10	0.77	Available
Reference materials	3.21	0.69	Available

ANOVA Test (Access to Information Resources by University)

Source of Variation	Sum of Squares	df	Mean Square	F	Sig
Between Groups	6.214	2	3.107	4.18	0.018
Within Groups	60.210	81	0.743		
Total	66.424	83			

Decision

Since p-value (0.018) < 0.05**, there is a** significant difference in access to information resources among laboratory technologists across the universities**.**

Interpretation of ANOVA Result

The ANOVA analysis indicates that access to information resources differs significantly among laboratory technologists across the selected universities**.** This variation may be attributed to differences in: Library infrastructure**,** Internet connectivity**,** Availability of electronic databases**,** Institutional funding. Studies have emphasized that ICT infrastructure and digital library facilities play a critical role in improving access to information resources in universities.

Discussion of Findings

The study revealed that inadequate ICT infrastructure and poor internet connectivity significantly affect access to information resources. This finding agrees with previous research indicating that technological infrastructure is a critical determinant of library resource accessibility in Nigerian universities. The study also found that lack of awareness of electronic resources is a major barrier to access. Many laboratory technologists are not adequately informed about available databases and digital library services. Another important factor identified was unstable electricity supply. This challenge affects the functionality of digital library systems and limits access to electronic resources. Furthermore, limited funding restricts the acquisition of scientific journals and databases required for laboratory research.

Conclusion

The study investigated factors affecting laboratory technologists' access to information resources in university libraries in Kano State. The findings revealed that technological, institutional, and personal factors significantly influence access to library resources. Improving ICT infrastructure, increasing funding, and providing training in information literacy are essential for enhancing access to information resources among laboratory technologists.

Recommendations

1. **Improved ICT Infrastructure** Universities should invest in high-speed internet, modern computers, and digital library platforms.
2. **Training Programs** Regular workshops should be organized to train laboratory technologists on database searching and information retrieval.
3. **Awareness Campaigns** Libraries should create awareness programs on available electronic resources.
4. **Increased Library Funding** Government and university management should allocate more funds to libraries for subscription to scientific databases.
5. **Stable Power Supply** Universities should provide alternative power sources such as solar systems and generators.
6. **Library Collaboration** University libraries should collaborate through consortiums to share information resources.

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